

 MITSUBISHI MATERIALS

# TURNING TOOLS



**DIA**  **EDGE**

**NEW**

# MITSUBISHI MATERIALS

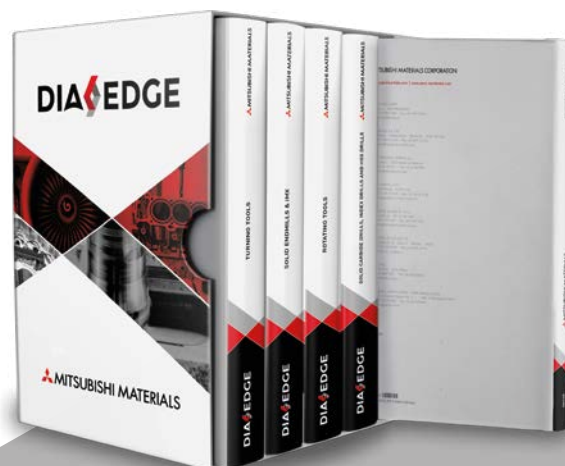
## INTRODUCING THE NEW GENERAL CATALOGUE C009 – 2022/2023

### TARGETED, COMPACT, HANDY.

Mitsubishi Materials' wide product portfolio is now shown in catalogues that represent individual application areas, offering users fast and easy access to targeted product information.

There is now a set of catalogues in small, practical sizes that comprise the following five volumes:

- **TURNING TOOLS**
- **DRILLING TOOLS**
- **SOLID MILLING TOOLS**
- **INDEXABLE MILLING TOOLS**
- **MPLUS**



**NEW DESIGN**

**EASY HANDLING**

**HIGHER FLEXIBILITY**

**INDIVIDUAL APPLICATION AREAS**

The slipcase provided enables easy storage and offers the required space for all future catalogues, including the product news brochures that will be published within the 2-year life cycle of the catalogue. Each new product news brochure published within the 2-year cycle will completely replace the previous version, therefore, please dispose of old versions.

### NOTES:

- With this publication, all previous general catalogues and product news brochures lose their validity.
- The product news catalogues are released twice a year, in April and October.
- The new general catalogue can be ordered only as a set of five. **Order number: C009E**



### DIGITAL VERSION

For the digital version of the catalogue, please scan the QR code or visit us at [www.mhg-mediastore.net](http://www.mhg-mediastore.net)

# TURNING TOOLS



## **QUALITY - HIGHEST STANDARDS ACROSS PRODUCTS AND SERVICES**

Turning tools from Mitsubishi embody this philosophy and have been convincing the global market for more than 30 years!

Mitsubishi's precision tools enrich the metalworking industry with durability, speed and accuracy.

Whether it is a grooving tool, an ISO insert or vibration-damping boring bar, the extensive range of turning tools has performance in mind.

# DIA EDGE

## CREATE A BETTER FUTURE TOGETHER WITH OUR CUSTOMERS

Announcing DIAEDGE, our new brand of tools that brings together cutting-edge technologies, exciting all who use them.

The aim is not only to offer value with our tools, but to think together with customers, share inspiration and continue to take on new challenges.



**MITSUBISHI MATERIALS**

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## TURNING TOOLS



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**1**

**GENERAL INFORMATION**



# HOW TO READ THE STANDARD OF TURNING INSERTS

## ● How this section page is organised

- ① Organised according to the insert shape.  
(Refer to the index on the next page.)
- ② Inserts are arranged in order of :
  - Negative inserts (with hole→without hole)
  - Positive inserts (with hole→without hole)
- ③ Breakers are arranged in order of :  
Finish Cutting→Light Cutting→Medium Cutting  
→Rough Cutting→Heavy Cutting

## GRADE APPLICATION RECOMMENDED FOR EACH WORK MATERIAL

Cutting conditions suitable for each type of work material is shown as a general guide to select the grade.

● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

SHAPE & ANGLE MARK

INDICATION OF NEGATIVE/ POSITIVE TYPE

PRODUCT SECTION

TITLE OF PRODUCT ACCORDING TO THE INSERT TYPE

**TURNING INSERTS [NEGATIVE]**

**80° CN TYPE INSERTS WITH HOLE**

CHIP CONTROL RANGE FOR WORK MATERIALS

Work Material: P Steel, M Stainless Steel, K Cast Iron, N Non-ferrous Metal, S Heat-resistant Alloy, Titanium Alloy

Order Number, Shape, RE (mm), Cutting Conditions (Stable, General, Unstable)

Inventory maintained, Non stock, produced to order only

## ● Graph of chip control by work material

Shows recommended chipbreakers and chip control range according to the work material and cutting application.

Graphs are coloured according to the applications (Finish→Light→Medium→Rough→Heavy)

and contain recommended breakers for each application.

Finish Cutting : — Light Cutting : — Medium Cutting : —  
Rough Cutting : — Heavy Cutting : —

INSERT NUMBER

STOCK STATUS

INSERT GRADES

Work Material: P Steel, M Stainless Steel, K Cast Iron, N Non-ferrous Metal, S Heat-resistant Alloy, Titanium Alloy

Order Number, Shape, RE (mm), Cutting Conditions (Stable, General, Unstable)

Inventory maintained, Non stock, produced to order only

**LEGEND FOR STOCK STATUS MARK**  
Is shown on the left hand page of each double-page spread.

**CUTTING APPLICATION**  
Is shown in order of: Finish→Light  
→Medium→Rough→Heavy.

**PHOTO OF INSERT**

**INDICATION OF CHIPBREAKER**  
Indicates the designation for a chipbreaker.

**PAGE REFERENCE**

- CHIPBREAKERS
- GRADES
- TECHNICAL DATA

Indicates reference pages, on the right hand page of each double-page spread.

**APPLICABLE HOLDER PAGE**

Indicates reference pages for details of applicable holders.

**CORNER RADIUS (RE)**

● To Order : Please specify

① insert number and ② grade.

# TURNING

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## STANDARD OF INSERTS

### NEGATIVE INSERTS WITH HOLE

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VN <sup>00</sup> TYPE...RHOMBIC 35°.....	A126
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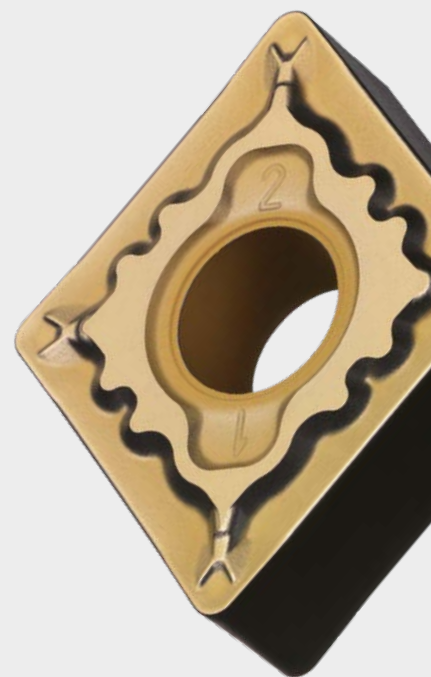
### POSITIVE INSERTS WITH HOLE

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# IDENTIFICATION

TURNING INSERTS

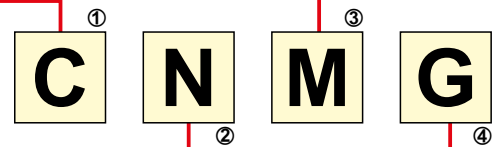
A

Symbol	Insert Shape	
H	Hexagonal	
O	Octagonal	
P	Pentagonal	
S	Square	
T	Triangular	
C	Rhombic 80°	
D	Rhombic 55°	
E	Rhombic 75°	
F	Rhombic 50°	
M	Rhombic 86°	
V	Rhombic 35°	
W	Trigon	
L	Rectangular	
A	Parallelogram 85°	
B	Parallelogram 82°	
K	Parallelogram 55°	
R	Round	
X	Special Design	

① Symbol for Insert Shape

③ Symbol for Tolerance Class				Detail of M Class Insert Tolerance							
Symbol	Tolerance of Nose Height M (mm)	Tolerance of Inscribed Circle IC (mm)	Tolerance of Thickness S (mm)	● Tolerance of Nose Height M (mm)							
				D.I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round	
A	±0.005	±0.025	±0.025	6.35	±0.08	±0.08	±0.08	±0.11	±0.16	—	
F	±0.005	±0.013	±0.025	9.525	±0.08	±0.08	±0.08	±0.11	±0.16	—	
C	±0.013	±0.025	±0.025	12.70	±0.13	±0.13	±0.13	±0.15	—	—	
H	±0.013	±0.013	±0.025	15.875	±0.15	±0.15	±0.15	±0.18	—	—	
E	±0.025	±0.025	±0.025	19.05	±0.15	±0.15	±0.15	±0.18	—	—	
G	±0.025	±0.025	±0.13	25.40	—	±0.18	—	—	—	—	
J	±0.005	±0.05—±0.15	±0.025	31.75	—	±0.20	—	—	—	—	
K*	±0.013	±0.05—±0.15	±0.025	● Tolerance of Inscribed Circle (mm)							
L*	±0.025	±0.05—±0.15	±0.025	D.I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round	
M*	±0.08—±0.18	±0.05—±0.15	±0.13	6.35	±0.05	±0.05	±0.05	±0.05	±0.05	—	
N*	±0.08—±0.18	±0.05—±0.15	±0.025	9.525	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05	
U*	±0.13—±0.38	±0.08—±0.25	±0.13	12.70	±0.08	±0.08	±0.08	±0.08	—	±0.08	
The surface of inserts with a * mark is sintered.				15.875	±0.10	±0.10	±0.10	±0.10	—	—	±0.10
				19.05	±0.10	±0.10	±0.10	±0.10	—	—	±0.10
				25.40	—	±0.13	—	—	—	—	±0.13
				31.75	—	±0.15	—	—	—	—	±0.15

③ Symbol for Tolerance Class



② Symbol for Normal Clearance		
Symbol	Normal Clearance	
A	3°	
B	5°	
C	7°	
D	15°	
E	20°	
F	25°	
G	30°	
N	0°	
P	11°	
O	Other Normal Clearance	
Major Normal Clearance		

④ Symbol for Fixing and / or for Chipbreaker									
Metric									
Symbol	Hole	Hole Configuration	Chip Breaker	Figure	Symbol	Hole	Hole Configuration	Chip Breaker	Figure
W	With Hole	Cylindrical Hole	No		A	With Hole	Cylindrical Hole	No	
T	With Hole	One Countersink (40—60°)	One Sided		M	With Hole	Cylindrical Hole	One Sided	
Q	With Hole	Cylindrical Hole	No		G	With Hole	Cylindrical Hole	Double Sided	
U	With Hole	Double Countersink (40—60°)	Double Sided		N	Without Hole	—	No	
B	With Hole	Cylindrical Hole	No		R	Without Hole	—	One Sided	
H	With Hole	One Countersink (70—90°)	One Sided		F	Without Hole	—	Double Sided	
C	With Hole	Cylindrical Hole	No		X	—	—	—	Special Design
J	With Hole	Double Countersink (70—90°)	Double Sided						



Symbol							Diameter of Inscribed Circle (mm)
R	W	V	D	C	S	T	
	02		04	03	03	06	3.97
	L3	08	05	04	04	08	4.76
	03	09	06	05	05	09	5.56
06							6.00
	04	11	07	06	06	11	6.35
	05	13	09	08	07	13	7.94
08							8.00
09	06	16	11	09	09	16	9.525
10							10.00
12							12.00
	08	22	15	12	12	22	12.70
15	10		19	16	15	27	15.875
16							16.00
19	13		23	19	19	33	19.05
20							20.00
			27	22	22	38	22.225
25							25.00
25			31	25	25	44	25.40
31			38	32	31	54	31.75
32							32.00

**⑤ Symbol for Insert Size**

\*Thickness is from the bottom of the insert to the top of the cutting edge.

Symbol	Thickness (mm)
S1	1.39
01	1.59
T0	1.79
02	2.38
T2	2.78
03	3.18
T3	3.97
04	4.76
06	6.35
07	7.94
09	9.52

**⑥ Symbol for Insert Thickness**

⑤
⑥
⑦
⑧
⑨
⑩

**⑦ Symbol for Insert Corner Size**

Symbol	Corner Radius (mm)
00	Sharp Nose
V3	0.03
V5	0.05
01	0.1
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4
28	2.8
32	3.2

00 : Inch  
M0 : Metric

Round Insert

**⑧ Symbol for Cutting Edge Type**

Figure	Cutting Edge	Symbol
	Sharp Cutting Edges	F
	Round Cutting Edges	E
	Chamfered Cutting Edges	T
	Chamfered and Rounded Cutting Edges	S
-	(-) Corner R tolerance	M

Mitsubishi Materials omit the honing symbol.

**⑨ Symbol for Cutting Direction**

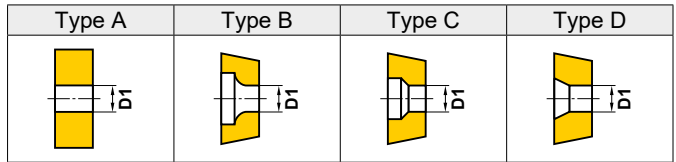
Figure	Hand	Symbol
	Right	R
	Left	L
	Neutral	N

**⑩ Symbol for Chipbreaker**

LP	MP	RP
LM	MM	RM
LK	MK	RK
LS	MS	RS
FP	LP	MP
MA	SW	MW
HZ	HX	HV

The table above is shown as reference example.

# HOLE GEOMETRY



TURNING INSERTS

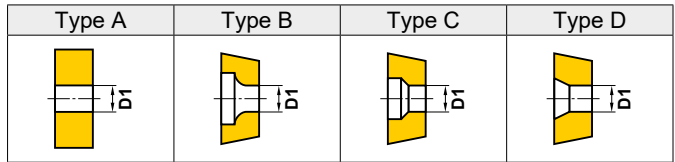
**A**

## NEGATIVE

Insert Number	Dimension (mm)		Hole Type	
	D1			
CNGA CNGG CNGM CNMA CNMG CNMM CNMP	0903	3.81	A	
	09T3	3.81	A	
	0904	3.81	A	
	1204	5.16	A	
	1606	6.35	A	
	1906	7.93	A	
	2509	9.12	A	
	DNGA DNGG DNGM DNMA DNMG DNMM DNMX	1104	3.81	A
		1504	5.16	A
1506		5.16	A	
SNGA SNGG SNMA SNMG SNMM		0903	3.81	A
		1204	5.16	A
		1506	6.35	A
	1906	7.93	A	
	2507	9.12	A	
2509	9.12	A		
TNGA TNGG TNGM TNMA TNMG TNMM TNMX	1103	2.26	A	
	1603	3.81	A	
	1604	3.81	A	
	2204	5.16	A	
	2706	6.35	A	
	3309	7.93	A	
	VNGA VNGM VNGG VNMA VNMG VNMM	1604	3.81	A
		WNGA WNMA WNMG	0603	3.81
06T3			3.81	A
0604			3.81	A
0804			5.16	A
1006			6.35	A
RNMG	090300	3.81	A	
	120400	5.16	A	
	150600	6.35	A	
	190600	7.93	A	
	250900	9.12	A	
	310900	12.7	A	

## POSITIVE

Insert Number	Dimensions (mm)		Hole Type	
	D1			
CCET	0602	2.8	B	
	09T3	4.4	B	
CCGB CCMB CCGH CCMH	0602	2.8	B	
	CCGT	03S1	2.0	B
		04T0	2.4	B
		0602	2.8	B
09T3		4.4	B	
CCMT	1204	5.5	B	
	0602	2.8	B	
	0803	3.4	B	
	09T3	4.4	B	
CCGW CCMW	1204	5.5	B	
	03S1	2.0	B	
	04T0	2.4	B	
	0602	2.8	B	
	09T3	4.4	B	
CPGT	1204	5.5	B	
	0802	3.4	B	
CPGB CPMB CPMH	0903	4.4	B	
	0802	3.5	D	
	0903	4.5	D	
CPMX	0802	3.5	D	
	0903	4.6	D	
DCET DCGT	0702	2.8	B	
	11T3	4.4	B	
DCGW DCMW DCMT	0702	2.8	B	
	11T3	4.4	B	
	1504	5.5	B	
DEGX	1504	5.1	C	
RCMX	1003M0	3.6	D	
	1204M0	4.2	D	
	1606M0	5.2	D	
	2006M0	6.5	D	
	3209M0	9.5	D	



## POSITIVE

Insert Number		Dimensions (mm)	
		D1	Hole Type
RCGT RCMT	0602M0	2.8	B
	0803M0	3.4	B
	10T3M0	4.4	B
SCMT SCMW	09T3 $\odot\odot$	4.4	B
	1204 $\odot\odot$	5.5	B
SPMW	0903 $\odot\odot$	4.6	B
	1203 $\odot\odot$	5.7	B
SPMT	0903 $\odot\odot$	4.4	B
	1203 $\odot\odot$	5.5	B
SPGX	0903 $\odot\odot$	4.8	D
	1203 $\odot\odot$	5.9	D
TCGT TCMT TCGW TCMW	0601 $\odot\odot$	2.3	B
	0802 $\odot\odot$	2.3	B
	0902 $\odot\odot$	2.5	B
	1102 $\odot\odot$	2.8	B
	1303 $\odot\odot$	3.4	B
16T3 $\odot\odot$	4.4	B	
TEGX	1603 $\odot\odot$	4.4	D
TPGX	0802 $\odot\odot$	2.5	C
	0902 $\odot\odot$	3.0	C
	1103 $\odot\odot$	3.5	C
	1603 $\odot\odot$	4.8	D
TPMX	0802 $\odot\odot$	2.7	C
	0902 $\odot\odot$	3.2	C
	1103 $\odot\odot$	3.7	C
	1103 $\odot\odot$ L	3.5	C
	1603 $\odot\odot$	4.8	D
TPGB TPMB TPGH TPMH	0802 $\odot\odot$	2.4	D
	0902 $\odot\odot$	2.9	D
	1103 $\odot\odot$	3.4	D
	1603 $\odot\odot$	4.4	D
TPGT	1603 $\odot\odot$	4.4	B
TPGV	0902 $\odot\odot$	2.8	B
	1103 $\odot\odot$	3.4	B

Insert Number		Dimensions (mm)	
		D1	Hole Type
VBET VBGT VBMT VBGW	1103 $\odot\odot$	2.9	B
	1604 $\odot\odot$	4.4	B
VCGT VCMT VCGW VCMW	0802 $\odot\odot$	2.4	B
	1103 $\odot\odot$	2.8	B
	1303 $\odot\odot$	3.4	B
	1604 $\odot\odot$	4.4	B
VDGX	1603 $\odot\odot$	4.5	D
VPET VPGT	0802 $\odot\odot$	2.42	B
	1103 $\odot\odot$	2.85	B
WBGT WBMT	0201 $\odot\odot$	2.3	B
	L302 $\odot\odot$	2.3	B
WCGT WCMT WCGW WCMW	0201 $\odot\odot$	2.3	B
	L302 $\odot\odot$	2.3	B
	0402 $\odot\odot$	2.8	B
	06T3 $\odot\odot$	4.4	B
WPGT WPMT	0402 $\odot\odot$	2.8	B
	0603 $\odot\odot$	4.4	B
XCMT	1503 $\odot\odot$	2.8	B

A

TURNING INSERTS

# PRECISION BREAKER SYSTEM

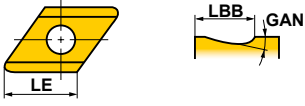
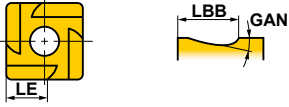
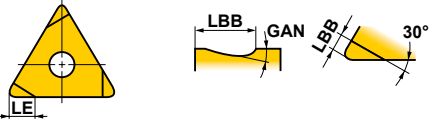
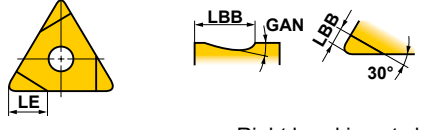
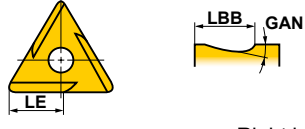
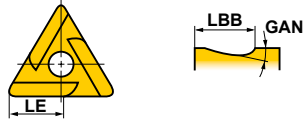


**STANDARD OF INSERTS WITH HAND OF TOOL**

**● NEGATIVE INSERTS**

Unit : mm



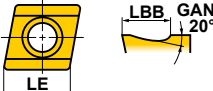

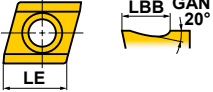
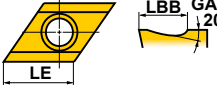

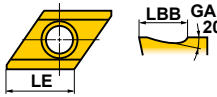



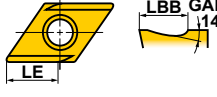
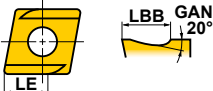
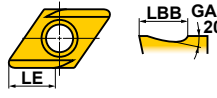

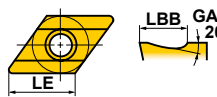


TURNING INSERTS

**A**

Geometry	Insert Number	LBB	LE	GAN
 <p>Right hand insert shown.</p>	DNGG150404R/L	2.8	14.9	15°
	DNGG150408R/L	2.8	14.3	15°
	DNGG150604R/L	2.8	14.9	15°
	DNGG150608R/L	2.8	14.3	15°
 <p>Right hand insert shown.</p>	SNGG090304R/L	1.8	1.6	15°
	SNGG090308R/L	1.8	1.6	15°
	SNGG120404R/L	2.3	3.7	15°
	SNGG120408R/L	2.3	3.7	15°
 <p>Right hand insert shown.</p>	TNGG160402R/L-FS	1.3	2.7	15°
	TNGG160404R/L-FS	1.3	2.8	15°
	TNGG160408R/L-FS	1.3	3.1	15°
 <p>Right hand insert shown.</p>	TNGG160402R/L-F	2.5	5.1	15°
	TNGG160404R/L-F	2.5	5.2	15°
	TNGG160408R/L-F	2.5	5.5	15°
 <p>Right hand insert shown.</p>	TNGG160402R/L-K	1.5	7.1	15°
	TNGG160404R/L-K	1.5	5.4	15°
	TNGG160408R/L-K	1.5	5.1	15°
 <p>Right hand insert shown.</p>	TNGG110302R/L	1.3	3.2	15°
	TNGG110304R/L	1.3	3.0	15°
	TNGG110308R/L	1.3	2.7	15°
	TNGG160304R/L	2.3	5.4	15°
	TNGG160402R/L	1.3	8.7	15°
	TNGG160404R/L	2.3	5.4	15°
	TNGG160408R/L	2.3	5.1	15°
	TNGG220404R/L	2.8	9.4	15°
TNGG220408R/L	2.8	9.1	15°	
 <p>Right hand insert shown.</p>	VNGG160404R/L	1.8	15.6	15°
	 <p>Right hand insert shown.</p>	VNGG160402R/L-F	2.5	7.4
VNGG160404R/L-F		2.5	7.6	15°

● POSITIVE INSERTS

Unit : mm

Geometry	Insert Number	LBB	LE	Geometry	Insert Number	LBB	LE
 <p>Right hand insert shown.</p>	CCET0602V3R/L-SR	2.2	6.4	 <p>Right hand insert shown.</p>	DCGT11T301MR-SRF	1.0	3.1
	CCET060201R/L-SR	2.2	6.3		DCGT11T302MR-SRF	1.0	3.2
	CCET060202R/L-SR	2.2	6.2		DCGT11T304MR-SRF	1.0	3.4
	CCET060204R/L-SR	2.2	6.0				
	CCET09T3V3R/L-SR	3.2	9.6				
	CCET09T301R/L-SR	3.2	9.5				
	CCET09T302R/L-SR	3.2	9.4				
	CCET09T304R/L-SR	3.2	9.2				
 <p>Right hand insert shown.</p>	CCET060200R/L-SN	1.0	6.4	 <p>Right hand insert shown.</p>	DCET0702V3R/L-SR	2.5	7.7
	CCET0602V3R/L-SN	1.0	6.4		DCET070201R/L-SR	2.5	7.6
	CCET060201R/L-SN	1.0	6.3		DCET070202R/L-SR	2.5	7.4
	CCET060202R/L-SN	1.0	6.2		DCET070204R/L-SR	2.5	7.1
	CCET060204R/L-SN	1.0	6.0		DCET11T3V3R/L-SR	3.7	11.6
	CCET09T300R/L-SN	1.5	9.6		DCET11T301R/L-SR	3.7	11.4
	CCET09T3V3R/L-SN	1.5	9.6		DCET11T302R/L-SR	3.7	11.3
	CCET09T301R/L-SN	1.5	9.5		DCET11T304R/L-SR	3.7	11.0
	CCET09T302R/L-SN	1.5	9.4				
	CCET09T304R/L-SN	1.5	9.2				
 <p>Right hand insert shown.</p>	CCET0602V3R/LW-SN	1.0	6.4	 <p>Right hand insert shown.</p>	DCET070200R/L-SN	1.0	7.7
	CCET09T3V3R/LW-SN	1.5	9.6		DCET0702V3R/L-SN	1.0	7.7
 <p>Right hand insert shown.</p>	CCGH060202(M)R/L-F	1.2	3.6	 <p>Right hand insert shown.</p>	DCET070201R/L-SN	1.0	7.6
	CCGH060204(M)R/L-F	1.4	4.4		DCET070202R/L-SN	1.0	7.4
 <p>Left hand insert shown.</p>	CCGT03S1V3L-F	0.8	1.4	 <p>Left hand insert shown.</p>	DCET070204R/L-SN	1.0	7.1
	CCGT03S101(M)R/L-F	0.8	1.4		DCET070204R/L-F	1.0	3.2
	CCGT03S102(M)R/L-F	0.8	1.5		DCGT11T302R/L-F	1.0	3.0
	CCGT03S104(M)R/L-F	0.8	1.6		DCGT11T304R/L-F	1.0	3.2
	CCGT04T0V3L-F	1.0	1.7				
	CCGT04T001(M)R/L-F	1.0	1.8				
	CCGT04T002(M)R/L-F	1.0	1.8				
	CCGT04T004(M)R/L-F	1.0	2.0				
 <p>Right hand insert shown.</p>	CCGT0602V3R/L-SS	1.0	3.0	 <p>Right hand insert shown.</p>	DCGT070202R/L-F	1.0	3.0
	CCGT060201(M)R/L-SS	1.0	3.0		DCGT070202R/L-F	1.0	3.2
	CCGT060202(M)R/L-SS	1.0	3.0		DCGT11T302R/L-F	1.0	3.0
	CCGT09T3V3R/L-SS	1.0	5.0		DCGT11T304R/L-F	1.0	3.2
	CCGT09T301(M)R/L-SS	1.0	5.0				
	CCGT09T302(M)R/L-SS	1.0	5.0				
	CCGT09T304MR/L-SS	1.0	5.0				
 <p>Right hand insert shown.</p>	CCGT0602V3R-SN	1.0	3.0	 <p>Right hand insert shown.</p>	DCGT0702V3R/L-SS	1.0	3.5
	CCGT060201(M)R/L-SN	1.0	3.0		DCGT070201R/L-SS	1.0	3.5
	CCGT060202(M)R/L-SN	1.0	3.0		DCGT070202(M)R/L-SS	1.0	3.5
	CCGT09T3V3R/L-SN	1.5	5.0		DCGT11T3V3R-SS	1.0	6.5
	CCGT09T301(M)R/L-SN	1.5	5.0		DCGT11T301(M)R/L-SS	1.0	6.5
	CCGT09T302(M)R/L-SN	1.5	5.0		DCGT11T302(M)R/L-SS	1.0	6.5
	CCGT09T304MR/L-SN	1.5	5.0		DCGT11T304MR/L-SS	1.0	6.5
 <p>Right hand insert shown.</p>	CCGT0602V3R-SN	1.0	3.0	 <p>Right hand insert shown.</p>	DCGT0702V3R-SN	1.0	3.5
	CCGT060201(M)R/L-SN	1.0	3.0		DCGT070201(M)R/L-SN	1.0	3.5
	CCGT060202(M)R/L-SN	1.0	3.0		DCGT070202(M)R/L-SN	1.0	3.5
	CCGT09T3V3R/L-SN	1.5	5.0		DCGT11T3V3R/L-SN	1.5	6.5
	CCGT09T301(M)R/L-SN	1.5	5.0		DCGT11T301(M)R/L-SN	1.5	6.5
	CCGT09T302(M)R/L-SN	1.5	5.0		DCGT11T302(M)R/L-SN	1.5	6.5
	CCGT09T304(M)R/L-SN	1.5	5.0		DCGT11T304(M)R/L-SN	1.5	6.5
 <p>Right hand insert shown.</p>	CPGT080204R/L-F	1.8	5.5	 <p>Right hand insert shown.</p>	DEGX150402R/L	2.8	15.2
	CPGT090302R/L-F	1.8	5.4		DEGX150404R/L	2.8	14.9
	CPGT090304R/L-F	1.8	5.5				

TURNING INSERTS

A

# PRECISION BREAKER SYSTEM

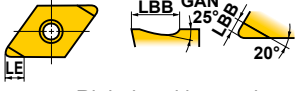
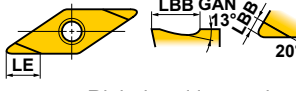
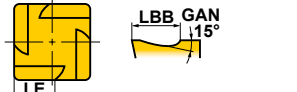
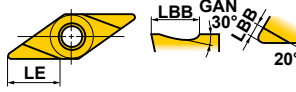
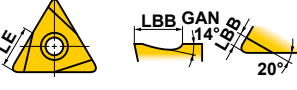
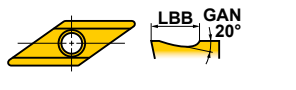

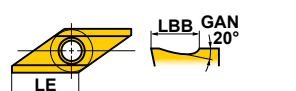

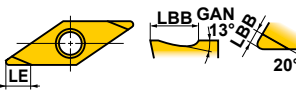

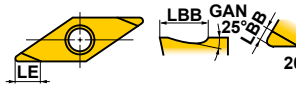


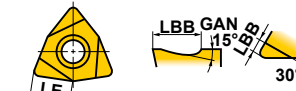

## STANDARD OF INSERTS WITH HAND OF TOOL

### ● POSITIVE INSERTS

Unit : mm

TURNING INSERTS

A

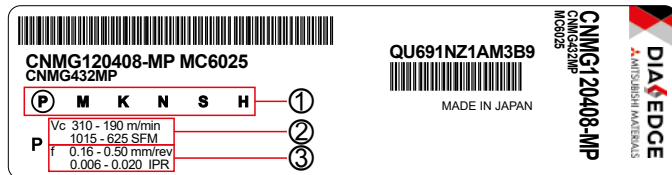
Geometry	Insert Number	LBB	LE	Geometry	Insert Number	LBB	LE
 Right hand insert shown.	DEGX150402R/L-F DEGX150404R/L-F	2.5 2.5	7.4 7.6	 Right hand insert shown.	VBGT110302R/L-F VBGT110304R/L-F VBGT160402R/L-F VBGT160404R/L-F	1.0 1.0 1.5 1.5	3.0 3.2 4.5 4.7
 Right hand insert shown.	SPGR090304R	1.8	1.6	 Right hand insert shown.	VBET1103V3R/L-SR VBET110301R/L-SR VBET110302R/L-SR VBET110304R/L-SR	2.5 2.5 2.5 2.5	7.3 7.3 7.4 7.6
 Left hand insert shown.	TCGT0601V3L-F TCGT060101L-F TCGT060102R/L-F TCGT060104R/L-F	1.0 1.0 1.0 1.0	2.9 3.0 3.0 3.2	 Right hand insert shown.	VBET110300R/L-SN VBET1103V3R/L-SN VBET110301R/L-SN VBET110302R/L-SN VBET110304R/L-SN	1.0 1.0 1.0 1.0 1.0	11.0 11.0 10.8 10.5 11.0
 Right hand insert shown.	TEGX160302R/L TEGX160304R/L	2.0 2.0	6.0 6.0	 Right hand insert shown.	VBET1103V3R/LW-SN	1.0	11.0
 Right hand insert shown.	TPGH080202R/L-FS TPGH080204R/L-FS TPGH090202R/L-FS TPGH090204R/L-FS TPGH110302R/L-FS TPGH110304R/L-FS TPGH160304R/L-FS TPGH160308R/L-FS	0.9 0.9 1.0 1.0 1.4 1.4 2.0 2.0	2.7 2.9 3.0 3.2 4.2 4.4 6.1 6.5	 Right hand insert shown.	VCGT080202R/L-F VCGT080204R/L-F	0.8 0.8	2.5 2.6
 Right hand insert shown.	TPGR110304R/L TPGR160304R/L TPGR160308R/L	1.3 2.3 2.3	3.0 5.4 5.1	 Right hand insert shown.	VDBG160302R/L VDBG160304R/L	2.0 2.0	6.0 6.1
 Right hand insert shown.	TPGX080202R/L TPGX080204R/L TPGX090202R/L TPGX090204R/L TPGX090208R/L TPGX110302L TPGX110304R/L TPGX110308R/L	1.3 1.3 1.6 1.6 1.4 1.8 1.8 1.8	3.9 4.1 4.8 5.0 4.7 5.4 5.5 5.9	 Left hand insert shown.	VPET080201R/L-SRF VPET080202R/L-SRF VPET1103V3R/L-SRF VPET110301R/L-SRF VPET110302R/L-SRF	0.8 0.8 1.0 1.0 1.0	2.4 2.5 2.9 3.0 3.0
				 Right hand insert shown.	WBGTL302V3L-F WBGTL30201L-F WBGTL30202R/L-F WBGTL30204R/L-F	1.0 1.0 1.0 1.0	2.0 2.1 2.1 2.2
				 Right hand insert shown.	WCGT020102R/L WCGT020104R/L WCGTL30202L WCGTL30204L	1.0 1.0 1.0 1.0	2.1 2.2 2.1 2.2
					WPGT040204R/L-FS WPGT060304R/L-FS	1.0 1.0	3.2 3.2

# TOOL NAVI

## OUTLINE

TOOL NAVI provides information and suitable cutting conditions for each work material by selecting the optimum indexable insert together with a suitable tool life expectancy.

## LABEL INDICATION



- \*1 Some inserts will have multiple material recommendations.
- \*2 Please contact us for recommended cutting conditions when using coefficient values other than above.

## ① Work materials

- P** : Steel (Reference material : Carbon steel, alloy steel 180HB)
- M** : Stainless steel (Reference material : Austenitic stainless steel 180HB)
- K** : Cast iron (Reference material : Gray cast iron, ductile cast iron 180HB)
- N** : Aluminium alloy, non-ferrous metals
- S** : Reference material : Titanium alloy 320HB, Ni, Co-Based alloy 400HB
- H** : Hardened steel 60HRC

## ② Cutting speed standards (Performance versus tool life)

Work Material	Tool Life		Material	Hardness
	Life	Performance		
<b>P</b>	90min	15min	Carbon steel, alloy steel	180HB
<b>M</b>	90min	15min	Stainless steel	180HB
<b>K</b>	90min	15min	Cast iron	180HB
<b>S</b>	25min	5min	Titanium alloy	320HB
			Ni, Co-Based Alloy	400HB
<b>H</b>	80min	10min	Hardened steel	60HRC

- \*3 N : Life based on each grade. For stable conditions choose the performance cutting speed, for unstable conditions choose the tool life feed rate.
- \*4 The tool life is based on the following (VB wear). Some materials include elements other than this.  
PMKS ... VB=0.3mm  
H 181 ... VB=0.1mm

## ③ Feed rate standards

Minimum and maximum feed rates shown are based on the chip control range and are dependant on the chipbreaker geometry.

## TOOL LIFE

Cutting speed has a large effect on tool life. TOOL NAVI is based on Taylor's equation (relationship  $Vc T^n=C$  between tool grade, cutting conditions, and tool life). Therefore, performance speed and tool life is found for each work material. When a different tool life is required, obtain coefficient values of the grade used from the charts below. Multiply the coefficient values by the cutting speed to calculate a new cutting speed.

### ● P Grade (Steel) cutting speed coefficient values.

Grade	Tool life	15min	30min	45min	60min	90min
<b>UE6105</b>		1.00	0.79	0.69	0.63	0.55
<b>MC6015</b> <b>MC6115</b>		1.00	0.82	0.72	0.67	0.59
<b>MC6025</b> <b>MC6125</b>		1.00	0.83	0.75	0.69	0.62
<b>MC6035</b>		1.00	0.88	0.82	0.78	0.73
<b>MP3025</b>		1.00	0.85	0.77	0.72	0.65
<b>NX2525</b>		1.00	0.87	0.80	0.76	0.70

### ● K Grade (Cast Iron) cutting speed coefficient values.

Grade	Tool life	15min	30min	45min	60min	90min
<b>MC5005</b>		1.00	0.83	0.75	0.70	0.63
<b>MC5015</b>		1.00	0.83	0.75	0.69	0.62

(ex.) Medium cutting of steel  
 The 1st recommendation : MC6025  
 Indexable inserts : CNMG120408-MP  
 Recommended cutting speed :  $Vc=310\text{m/min}$   
 (Tool life : 15min.)



Tool life required : 30min.

$$310 \times 0.83 \approx 257\text{m/min}$$

### ● M Grade (Stainless Steel) cutting speed coefficient values.

Grade	Tool life	15min	30min	45min	60min	90min
<b>MC7015</b>		1.00	0.83	0.75	0.70	0.63
<b>MC7025</b>		1.00	0.90	0.84	0.80	0.75
<b>MP7035</b>		1.00	0.84	0.76	0.71	0.62
<b>US735</b>		1.00	0.78	0.68	0.61	0.53

## HARDNESS OF THE WORK MATERIAL

Hardness of the work material also affects tool life. Mitsubishi's TOOL NAVI suggests cutting speed variations when material hardness differs. Obtain the suitable coefficient value for each type of work material from the chart below. Multiply the coefficient value by the recommended cutting speed of the grade used to calculate a new cutting speed.

Work material	(Hardness of workpiece)											
	Soft	120HB	140HB	160HB	180HB	200HB	220HB	240HB	260HB	280HB	300HB	320HB
<b>P</b>	1.34	1.19	1.08	1.00	0.92	0.85	0.80	0.75	0.71	0.68	0.64	0.61
<b>M</b>	1.41	1.23	1.10	1.00	0.91	0.85	0.78	0.72	0.68	0.64	0.61	0.58
<b>K</b>	1.27	1.19	1.09	1.00	0.97	0.91	0.88	0.85	0.81	0.78	0.75	0.72

## OPTIMUM GRADES AND CHIPBREAKERS FOR EXTERNAL TURNING

### ● Selection of optimum inserts for turning

The following diagrams show for each type of work material, the optimal combination of suitable grades and chipbreakers for each application area in turning.

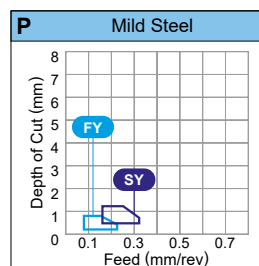
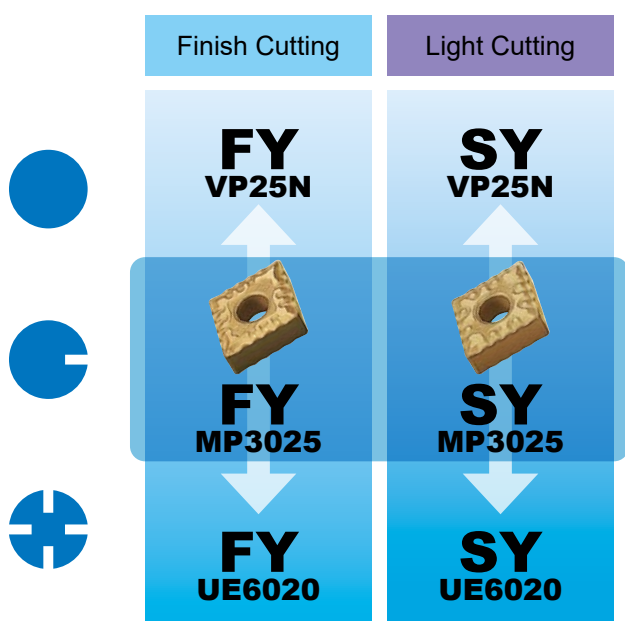
TURNING INSERTS

### ■ CUTTING CONDITIONS

- Stable Cutting
  - Continuous Cutting
  - Constant Depth of Cut
  - Pre-Machined
  - Securely Clamped Component Cutting
- General Cutting
- ⊕ Unstable Cutting
  - Heavy Interrupted Cutting
  - Irregular Depth of Cut
  - Low Clamping Rigidity Cutting

### ■ CUTTING AREA

- F** Finish Cutting
- L** Light Cutting
- M** Medium Cutting
- R** Rough Cutting
- H** Heavy Cutting



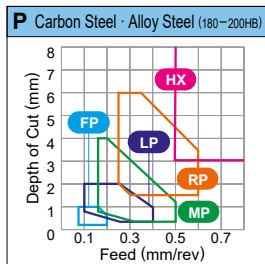
### **P** Mild Steel\* (ex. St37-2, Ck10) NEGATIVE INSERTS

Vc : Cutting Speed  
f : Feed  
ap : Depth of Cut

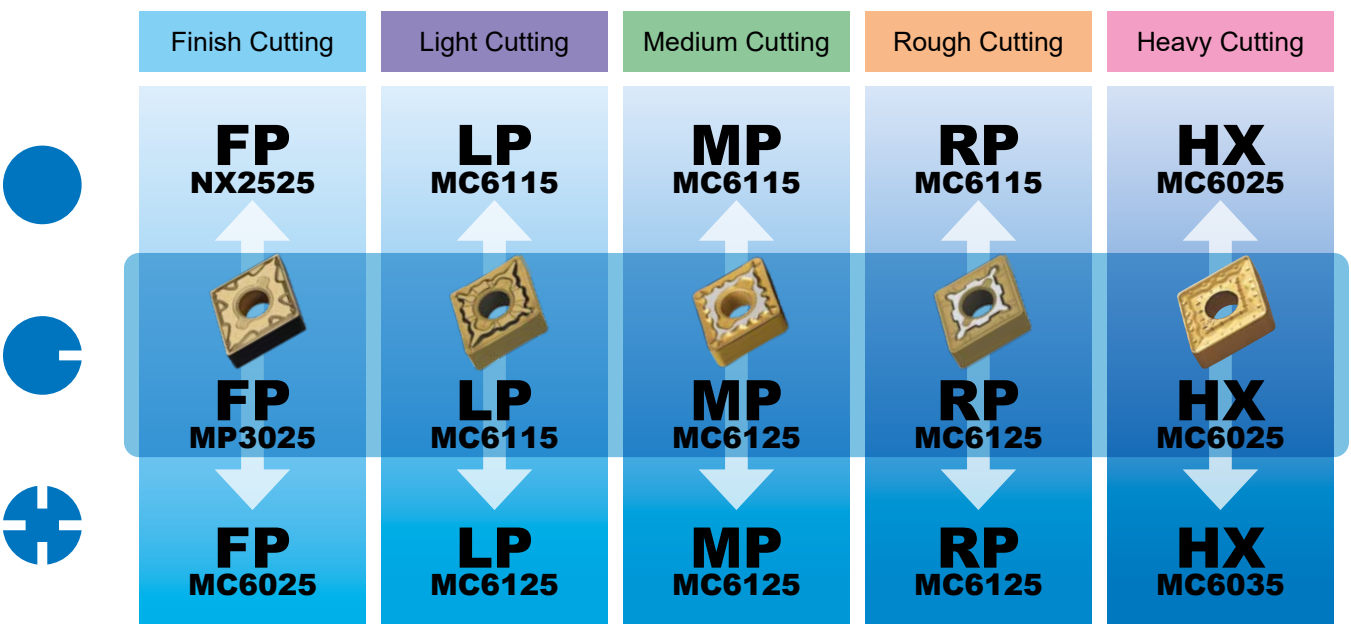
	Cutting Area	Chipbreaker	Grade	1st Recommendation		
				Vc (m/min)	f (mm/rev)	ap (mm)
● Stable Cutting	<b>F</b>	<b>FY</b>	<b>VP25N</b>	285-450	0.09-0.23	0.20-0.80
	<b>L</b>	<b>SY</b>	<b>VP25N</b>	260-410	0.16-0.33	0.50-1.20
● General Cutting	<b>F</b>	<b>FY</b>	<b>MP3025</b>	275-425	0.09-0.23	0.20-0.80
	<b>L</b>	<b>SY</b>	<b>MP3025</b>	255-385	0.16-0.33	0.50-1.20
⊕ Unstable Cutting	<b>F</b>	<b>FY</b>	<b>UE6020</b>	285-465	0.09-0.23	0.20-0.80
	<b>L</b>	<b>SY</b>	<b>UE6020</b>	260-425	0.16-0.33	0.50-1.20

\*Please refer to page A074 for other steels.





- Stable Cutting
- General Cutting
- Unstable Cutting
- F** Finish Cutting
- L** Light Cutting
- M** Medium Cutting
- R** Rough Cutting
- H** Heavy Cutting



**P** Carbon Steel • Alloy Steel\* (ex. Ck45, 42CrMo4)  
NEGATIVE INSERTS

Vc : Cutting Speed  
f : Feed  
ap : Depth of Cut

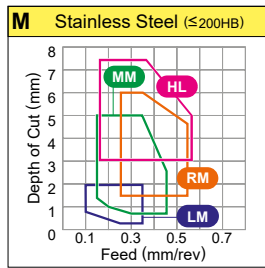
	Cutting Area	Chipbreaker	Grade	1st Recommendation		
				Vc (m/min)	f (mm/rev)	ap (mm)
<span style="font-size: 2em;">●</span> Stable Cutting	<b>F</b>	<b>FP</b>	<b>NX2525</b>	210-300	0.08-0.25	0.10-1.00
	<b>L</b>	<b>LP</b>	<b>MC6115</b>	250-480	0.10-0.40	0.30-2.00
	<b>M</b>	<b>MP</b>	<b>MC6115</b>	230-440	0.16-0.50	0.30-4.00
	<b>R</b>	<b>RP</b>	<b>MC6115</b>	215-415	0.25-0.60	1.50-6.00
	<b>H</b>	<b>HX</b>	<b>MC6025</b>	165-265	0.50-1.26	3.00-11.00
<span style="font-size: 2em;">◐</span> General Cutting	<b>F</b>	<b>FP</b>	<b>MP3025</b>	215-330	0.08-0.25	0.10-1.00
	<b>L</b>	<b>LP</b>	<b>MC6115</b>	250-480	0.10-0.40	0.30-2.00
	<b>M</b>	<b>MP</b>	<b>MC6125</b>	250-390	0.16-0.50	0.30-4.00
	<b>R</b>	<b>RP</b>	<b>MC6125</b>	235-370	0.25-0.60	1.50-6.00
	<b>H</b>	<b>HX</b>	<b>MC6025</b>	165-265	0.50-1.26	3.00-11.00
<span style="font-size: 2em;">⊕</span> Unstable Cutting	<b>F</b>	<b>FP</b>	<b>MC6025</b>	230-375	0.08-0.25	0.10-1.00
	<b>L</b>	<b>LP</b>	<b>MC6125</b>	275-425	0.10-0.40	0.30-2.00
	<b>M</b>	<b>MP</b>	<b>MC6125</b>	250-390	0.16-0.50	0.30-4.00
	<b>R</b>	<b>RP</b>	<b>MC6125</b>	235-370	0.25-0.60	1.50-6.00
	<b>H</b>	<b>HX</b>	<b>MC6035</b>	140-200	0.50-1.26	3.00-11.00

\*Please refer to page A074 for other steels.

## OPTIMUM GRADES AND CHIPBREAKERS FOR EXTERNAL TURNING

TURNING INSERTS

A



- Stable Cutting
- General Cutting
- Unstable Cutting

- L** Light Cutting
- M** Medium Cutting
- R** Rough Cutting
- H** Heavy Cutting

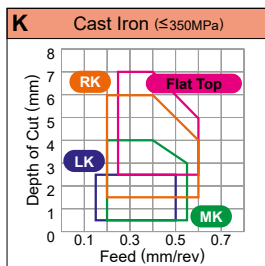
	Light Cutting	Medium Cutting	Rough Cutting	Heavy Cutting
	<b>LM</b> MC7015	<b>MM</b> MC7015	<b>RM</b> MC7015	<b>HL</b> US735
	<b>LM</b> MC7025	<b>MM</b> MC7025	<b>RM</b> MC7025	<b>HL</b> US735
	<b>LM</b> MP7035	<b>MM</b> MP7035	<b>RM</b> MP7035	<b>HL</b> US735

### **M** Stainless Steel\* (ex. X5CrNi189, X5CrNiMo1810)

Vc : Cutting Speed  
f : Feed  
ap : Depth of Cut

	Cutting Area	Chipbreaker	Grade	1st Recommendation		
				Vc (m/min)	f (mm/rev)	ap (mm)
	<b>L</b>	<b>LM</b>	<b>MC7015</b>	180–285	0.10–0.30	0.30–2.00
	<b>M</b>	<b>MM</b>	<b>MC7015</b>	165–260	0.15–0.45	0.70–5.00
	<b>R</b>	<b>RM</b>	<b>MC7015</b>	155–245	0.25–0.55	1.50–6.00
	<b>H</b>	<b>HL</b>	<b>US735</b>	75–140	0.40–1.00	1.50–8.00
	<b>L</b>	<b>LM</b>	<b>MC7025</b>	165–220	0.10–0.30	0.30–2.00
	<b>M</b>	<b>MM</b>	<b>MC7025</b>	150–200	0.15–0.45	0.70–5.00
	<b>R</b>	<b>RM</b>	<b>MC7025</b>	140–190	0.25–0.55	1.50–6.00
	<b>H</b>	<b>HL</b>	<b>US735</b>	75–140	0.40–1.00	1.50–8.00
	<b>L</b>	<b>LM</b>	<b>MP7035</b>	95–155	0.10–0.30	0.30–2.00
	<b>M</b>	<b>MM</b>	<b>MP7035</b>	90–145	0.15–0.45	0.70–5.00
	<b>R</b>	<b>RM</b>	<b>MP7035</b>	85–135	0.25–0.55	1.50–6.00
	<b>H</b>	<b>HL</b>	<b>US735</b>	75–140	0.40–1.00	1.50–8.00

\*Please refer to page A078 for other stainless steel.



- Stable Cutting
- General Cutting
- Unstable Cutting
- L** Light Cutting
- M** Medium Cutting
- R** Rough Cutting
- H** Heavy Cutting



**K Cast Iron\*** (ex. GG30)  
NEGATIVE INSERTS

Vc : Cutting Speed  
f : Feed  
ap : Depth of Cut

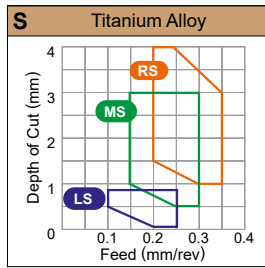
	Cutting Area	Chipbreaker	Grade	1st Recommendation		
				Vc (m/min)	f (mm/rev)	ap (mm)
	<b>L</b>	<b>LK</b>	<b>MC5005</b>	230-365	0.10-0.40	0.30-2.00
	<b>M</b>	<b>MK</b>	<b>MC5005</b>	210-335	0.20-0.55	1.00-4.00
	<b>R</b>	<b>RK</b>	<b>MC5005</b>	195-315	0.25-0.60	1.50-6.00
	<b>H</b>	<b>Flat Top</b>	<b>MC5005</b>	195-315	0.20-0.60	2.50-6.00
	<b>L</b>	<b>LK</b>	<b>MC5015</b>	205-335	0.10-0.40	0.30-2.00
	<b>M</b>	<b>MK</b>	<b>MC5015</b>	190-305	0.20-0.55	1.00-4.00
	<b>R</b>	<b>RK</b>	<b>MC5015</b>	180-285	0.25-0.60	1.50-6.00
	<b>H</b>	<b>Flat Top</b>	<b>MC5015</b>	180-285	0.20-0.60	2.50-6.00
	<b>L</b>	<b>LK</b>	<b>MC5015</b>	205-335	0.10-0.40	0.30-2.00
	<b>M</b>	<b>MK</b>	<b>MC5015</b>	190-305	0.20-0.55	1.00-4.00
	<b>R</b>	<b>RK</b>	<b>MC5015</b>	180-285	0.25-0.60	1.50-6.00
	<b>H</b>	<b>Flat Top</b>	<b>MC5015</b>	180-285	0.20-0.60	2.50-6.00

\*Please refer to page A083 for other types of cast iron.

## OPTIMUM GRADES AND CHIPBREAKERS FOR EXTERNAL TURNING

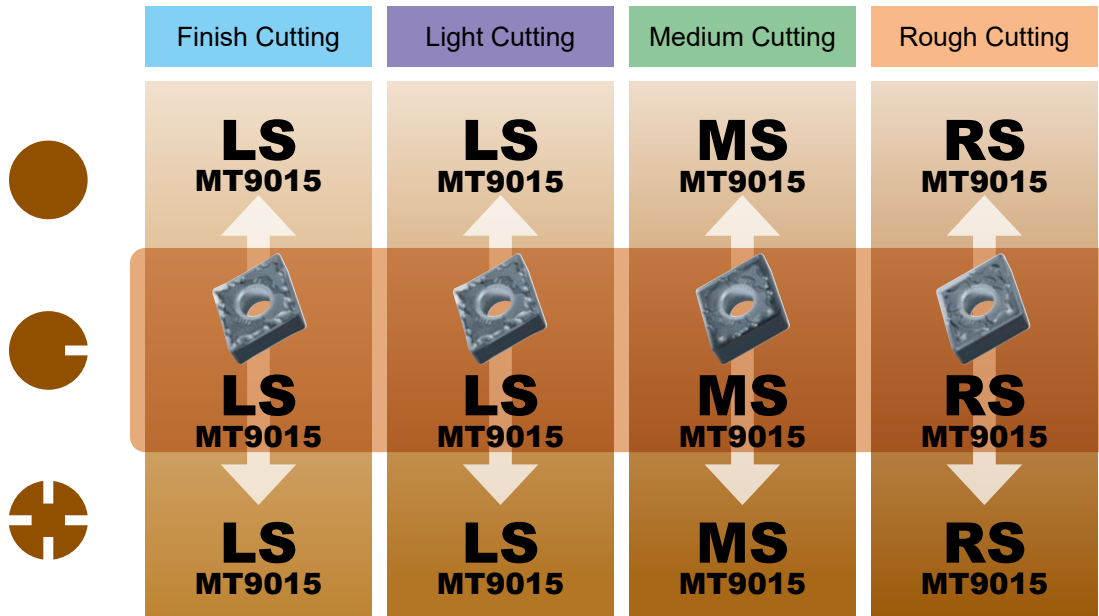
TURNING INSERTS

A



- Stable Cutting
- ◐ General Cutting
- ⊕ Unstable Cutting

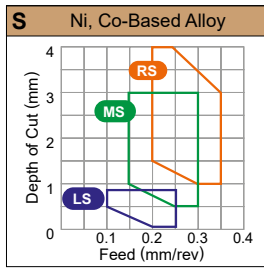
- F** Finish Cutting
- L** Light Cutting
- M** Medium Cutting
- R** Rough Cutting



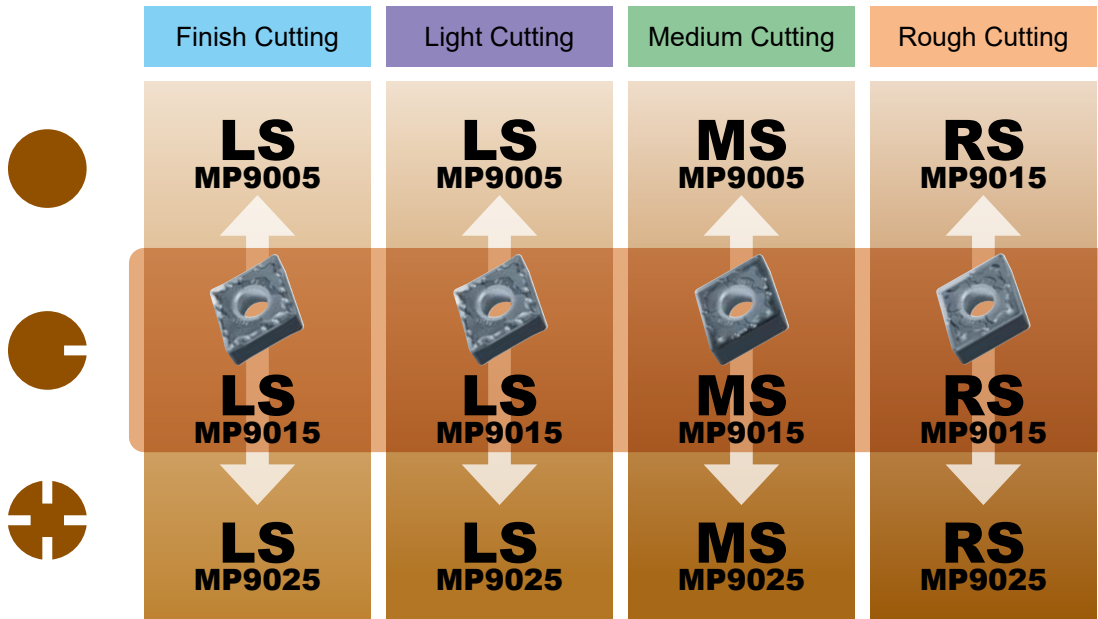
**S** Titanium Alloy (ex. Ti-6Al-4V)  
NEGATIVE INSERTS

Vc : Cutting Speed  
f : Feed  
ap : Depth of Cut

	Cutting Area	Chipbreaker	Grade	1st Recommendation		
				Vc (m/min)	f (mm/rev)	ap (mm)
● Stable Cutting	<b>F</b>	<b>LS</b>	<b>MT9015</b>	40-85	0.10-0.25	0.20-0.80
	<b>L</b>	<b>LS</b>	<b>MT9015</b>	40-85	0.10-0.25	0.20-0.80
	<b>M</b>	<b>MS</b>	<b>MT9015</b>	40-80	0.15-0.30	0.50-3.00
	<b>R</b>	<b>RS</b>	<b>MT9015</b>	35-75	0.20-0.35	1.00-4.00
◐ General Cutting	<b>F</b>	<b>LS</b>	<b>MT9015</b>	40-85	0.10-0.25	0.20-0.80
	<b>L</b>	<b>LS</b>	<b>MT9015</b>	40-85	0.10-0.25	0.20-0.80
	<b>M</b>	<b>MS</b>	<b>MT9015</b>	40-80	0.15-0.30	0.50-3.00
	<b>R</b>	<b>RS</b>	<b>MT9015</b>	35-75	0.20-0.35	1.00-4.00
⊕ Unstable Cutting	<b>F</b>	<b>LS</b>	<b>MT9015</b>	40-85	0.10-0.25	0.20-0.80
	<b>L</b>	<b>LS</b>	<b>MT9015</b>	40-85	0.10-0.25	0.20-0.80
	<b>M</b>	<b>MS</b>	<b>MT9015</b>	40-80	0.15-0.30	0.50-3.00
	<b>R</b>	<b>RS</b>	<b>MT9015</b>	35-75	0.20-0.35	1.00-4.00



- Stable Cutting
- General Cutting
- Unstable Cutting
- F** Finish Cutting
- L** Light Cutting
- M** Medium Cutting
- R** Rough Cutting

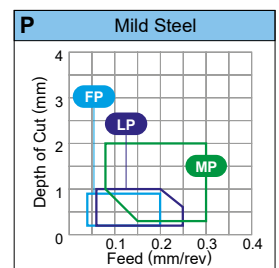
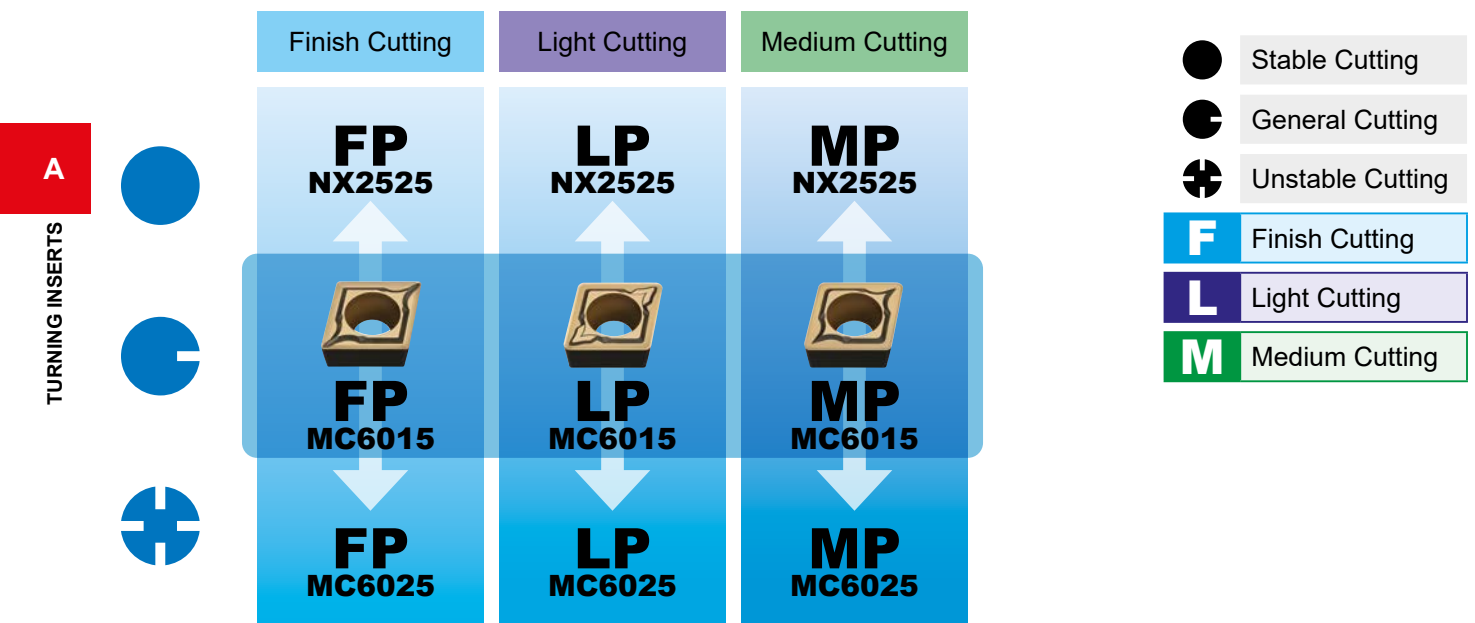


**S** Ni, Co-Based Alloy (ex. Inconel®718)  
NEGATIVE INSERTS

Vc : Cutting Speed  
f : Feed  
ap : Depth of Cut

	Cutting Area	Chipbreaker	Grade	1st Recommendation		
				Vc (m/min)	f (mm/rev)	ap (mm)
	<b>F</b>	<b>LS</b>	<b>MP9005</b>	30-110	0.10-0.25	0.20-0.80
	<b>L</b>	<b>LS</b>	<b>MP9005</b>	30-110	0.10-0.25	0.20-0.80
	<b>M</b>	<b>MS</b>	<b>MP9005</b>	30-100	0.15-0.30	0.50-3.00
	<b>R</b>	<b>RS</b>	<b>MP9015</b>	20-75	0.20-0.35	1.00-4.00
	<b>F</b>	<b>LS</b>	<b>MP9015</b>	25-85	0.10-0.25	0.20-0.80
	<b>L</b>	<b>LS</b>	<b>MP9015</b>	25-85	0.10-0.25	0.20-0.80
	<b>M</b>	<b>MS</b>	<b>MP9015</b>	25-80	0.15-0.30	0.50-3.00
	<b>R</b>	<b>RS</b>	<b>MP9015</b>	20-75	0.20-0.35	1.00-4.00
	<b>F</b>	<b>LS</b>	<b>MP9025</b>	20-30	0.10-0.25	0.20-0.80
	<b>L</b>	<b>LS</b>	<b>MP9025</b>	20-30	0.10-0.25	0.20-0.80
	<b>M</b>	<b>MS</b>	<b>MP9025</b>	20-30	0.15-0.30	0.50-3.00
	<b>R</b>	<b>RS</b>	<b>MP9025</b>	15-25	0.20-0.35	1.00-4.00

## OPTIMUM GRADES AND CHIPBREAKERS FOR EXTERNAL TURNING

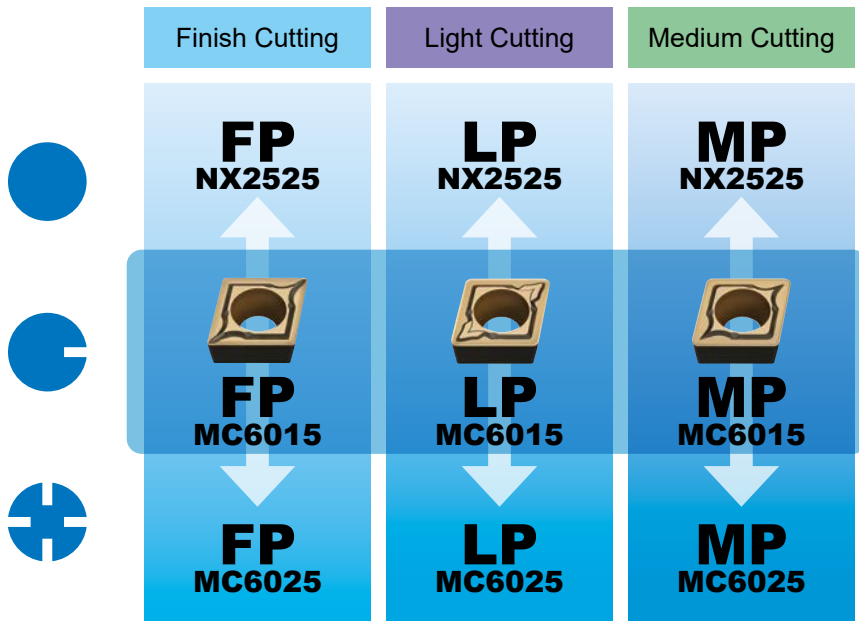


**P** Mild Steel\* (ex. St37-2, Ck10)  
7° POSITIVE INSERTS WITH HOLE

Vc : Cutting Speed  
f : Feed  
ap : Depth of Cut

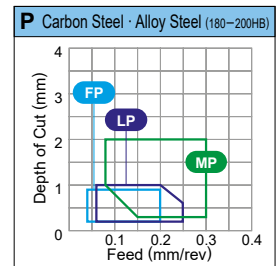
	Cutting Area	Chipbreaker	Grade	1st Recommendation		
				Vc (m/min)	f (mm/rev)	ap (mm)
● Stable Cutting	<b>F</b>	<b>FP</b>	<b>NX2525</b>	225-320	0.04-0.20	0.20-0.90
	<b>L</b>	<b>LP</b>	<b>NX2525</b>	225-320	0.06-0.25	0.20-1.00
	<b>M</b>	<b>MP</b>	<b>NX2525</b>	185-270	0.08-0.30	0.30-2.00
◐ General Cutting	<b>F</b>	<b>FP</b>	<b>MC6015</b>	250-425	0.04-0.20	0.20-0.90
	<b>L</b>	<b>LP</b>	<b>MC6015</b>	250-425	0.06-0.25	0.20-1.00
	<b>M</b>	<b>MP</b>	<b>MC6015</b>	210-355	0.08-0.30	0.30-2.00
⊕ Unstable Cutting	<b>F</b>	<b>FP</b>	<b>MC6025</b>	250-405	0.04-0.20	0.20-0.90
	<b>L</b>	<b>LP</b>	<b>MC6025</b>	250-405	0.06-0.25	0.20-1.00
	<b>M</b>	<b>MP</b>	<b>MC6025</b>	210-340	0.08-0.30	0.30-2.00

\*Please refer to page A087 for other steel.



- Stable Cutting
- General Cutting
- Unstable Cutting
- F** Finish Cutting
- L** Light Cutting
- M** Medium Cutting

**A**  
TURNING INSERTS



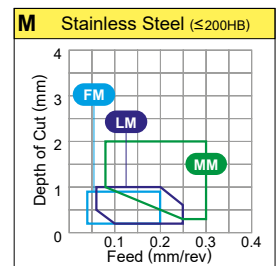
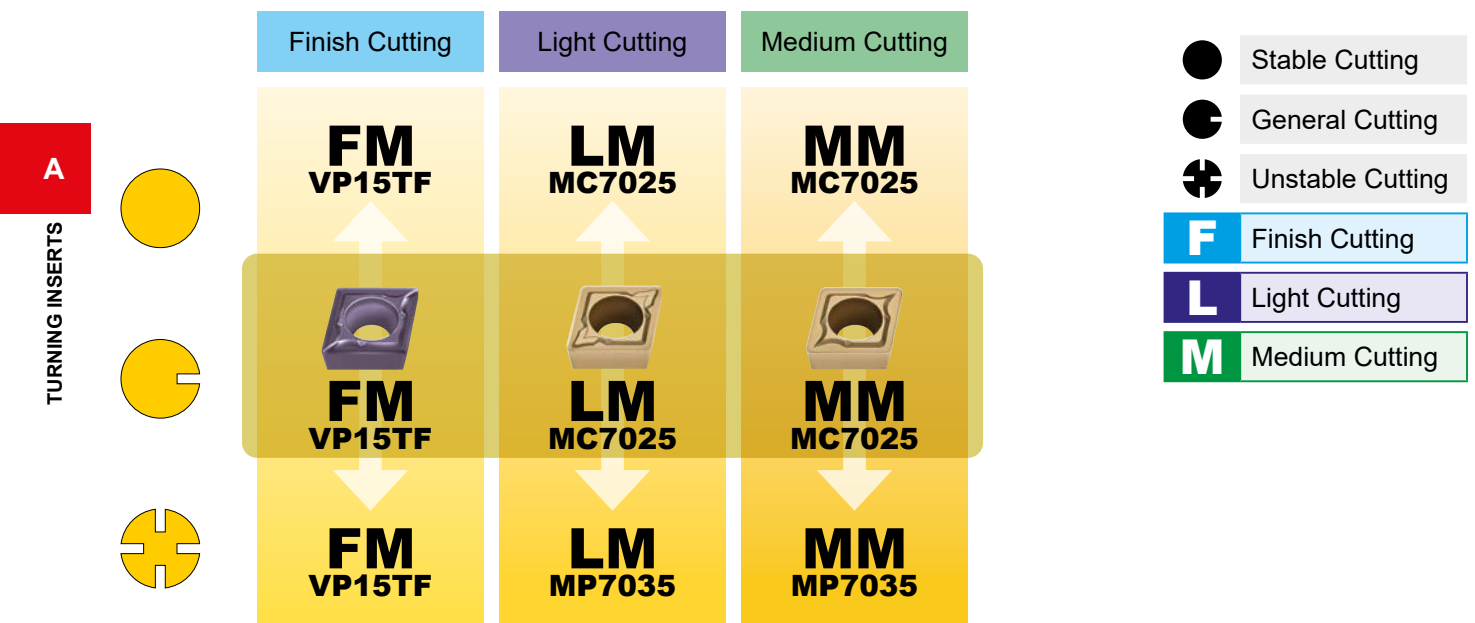
**P** Carbon Steel · Alloy Steel\* (ex. Ck45, 42CrMo4)  
7° POSITIVE INSERTS WITH HOLE

Vc : Cutting Speed  
f : Feed  
ap : Depth of Cut

	Cutting Area	Chipbreaker	Grade	1st Recommendation		
				Vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	<b>F</b>	<b>FP</b>	<b>NX2525</b>	165-240	0.04-0.20	0.20-0.90
	<b>L</b>	<b>LP</b>	<b>NX2525</b>	165-240	0.06-0.25	0.20-1.00
	<b>M</b>	<b>MP</b>	<b>NX2525</b>	140-200	0.08-0.30	0.30-2.00
General Cutting	<b>F</b>	<b>FP</b>	<b>MC6015</b>	185-315	0.04-0.20	0.20-0.90
	<b>L</b>	<b>LP</b>	<b>MC6015</b>	185-315	0.06-0.25	0.20-1.00
	<b>M</b>	<b>MP</b>	<b>MC6015</b>	155-260	0.08-0.30	0.30-2.00
Unstable Cutting	<b>F</b>	<b>FP</b>	<b>MC6025</b>	185-300	0.04-0.20	0.20-0.90
	<b>L</b>	<b>LP</b>	<b>MC6025</b>	185-300	0.06-0.25	0.20-1.00
	<b>M</b>	<b>MP</b>	<b>MC6025</b>	155-250	0.08-0.30	0.30-2.00

\*Please refer to page A087 for other steel.

## OPTIMUM GRADES AND CHIPBREAKERS FOR EXTERNAL TURNING



### **M** Stainless Steel\* (ex. X5CrNi189, X5CrNiMo1810)

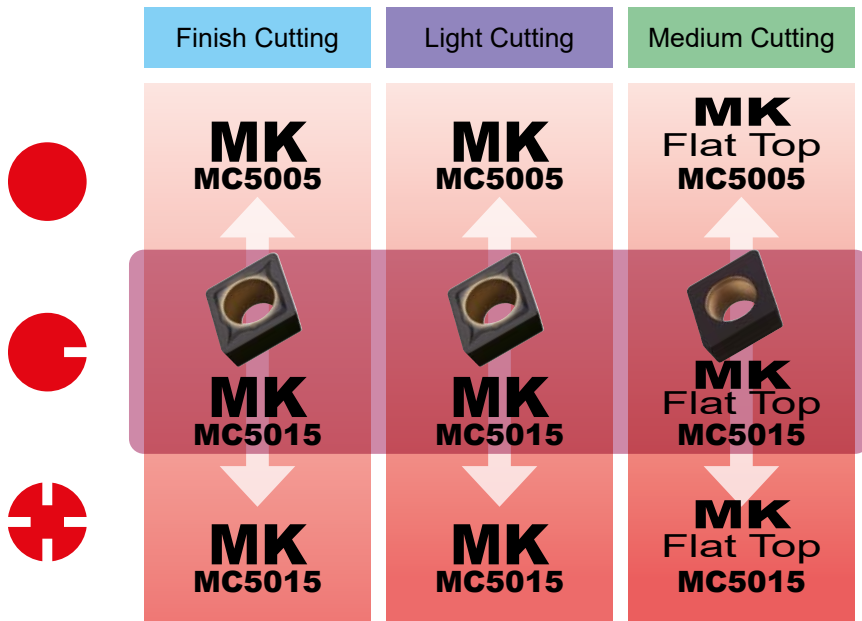
7° POSITIVE INSERTS WITH HOLE

**V<sub>c</sub>** : Cutting Speed  
**f** : Feed  
**ap** : Depth of Cut

	Cutting Area	Chipbreaker	Grade	1st Recommendation		
				V <sub>c</sub> (m/min)	f (mm/rev)	ap (mm)
Stable Cutting (●)	<b>F</b>	<b>FM</b>	<b>VP15TF</b>	75-125	0.04-0.20	0.20-0.90
	<b>L</b>	<b>LM</b>	<b>MC7025</b>	140-190	0.06-0.25	0.20-1.00
	<b>M</b>	<b>MM</b>	<b>MC7025</b>	120-160	0.08-0.30	0.30-2.00
General Cutting (◐)	<b>F</b>	<b>FM</b>	<b>VP15TF</b>	75-125	0.04-0.20	0.20-0.90
	<b>L</b>	<b>LM</b>	<b>MC7025</b>	140-190	0.06-0.25	0.20-1.00
	<b>M</b>	<b>MM</b>	<b>MC7025</b>	120-160	0.08-0.30	0.30-2.00
Unstable Cutting (⊕)	<b>F</b>	<b>FM</b>	<b>VP15TF</b>	75-125	0.04-0.20	0.20-0.90
	<b>L</b>	<b>LM</b>	<b>MP7035</b>	85-135	0.06-0.25	0.20-1.00
	<b>M</b>	<b>MM</b>	<b>MP7035</b>	70-115	0.08-0.30	0.30-2.00

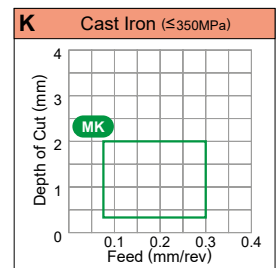
\*Please refer to page A089 for other stainless steel.





- Stable Cutting
- General Cutting
- Unstable Cutting
- F** Finish Cutting
- L** Light Cutting
- M** Medium Cutting

**A**  
TURNING INSERTS



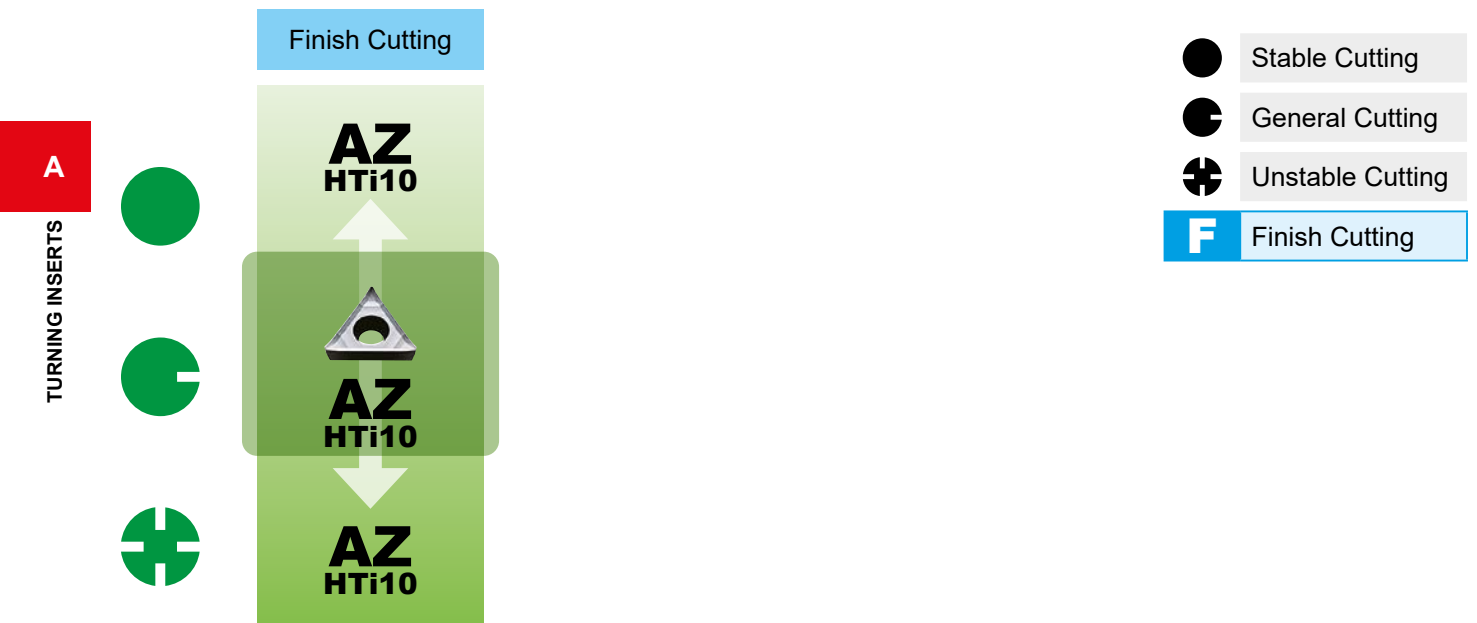
**K** Cast Iron\* (ex. GG30)  
7° POSITIVE INSERTS WITH HOLE

Vc : Cutting Speed  
f : Feed  
ap : Depth of Cut

	Cutting Area	Chipbreaker	Grade	1st Recommendation		
				Vc (m/min)	f (mm/rev)	ap (mm)
	<b>F</b>	<b>MK</b>	<b>MC5005</b>	165–265	0.08–0.30	0.30–2.00
	<b>L</b>	<b>MK</b>	<b>MC5005</b>	165–265	0.08–0.30	0.30–2.00
	<b>M</b>	<b>MK, Flat Top</b>	<b>MC5005</b>	165–265	0.08–0.30	0.30–2.00
	<b>F</b>	<b>MK</b>	<b>MC5015</b>	150–240	0.08–0.30	0.30–2.00
	<b>L</b>	<b>MK</b>	<b>MC5015</b>	150–240	0.08–0.30	0.30–2.00
	<b>M</b>	<b>MK, Flat Top</b>	<b>MC5015</b>	150–240	0.08–0.30	0.30–2.00
	<b>F</b>	<b>MK</b>	<b>MC5015</b>	150–240	0.08–0.30	0.30–2.00
	<b>L</b>	<b>MK</b>	<b>MC5015</b>	150–240	0.08–0.30	0.30–2.00
	<b>M</b>	<b>MK, Flat Top</b>	<b>MC5015</b>	150–240	0.08–0.30	0.30–2.00

\*Please refer to page A092 for other types of cast iron.

## OPTIMUM GRADES AND CHIPBREAKERS FOR EXTERNAL TURNING

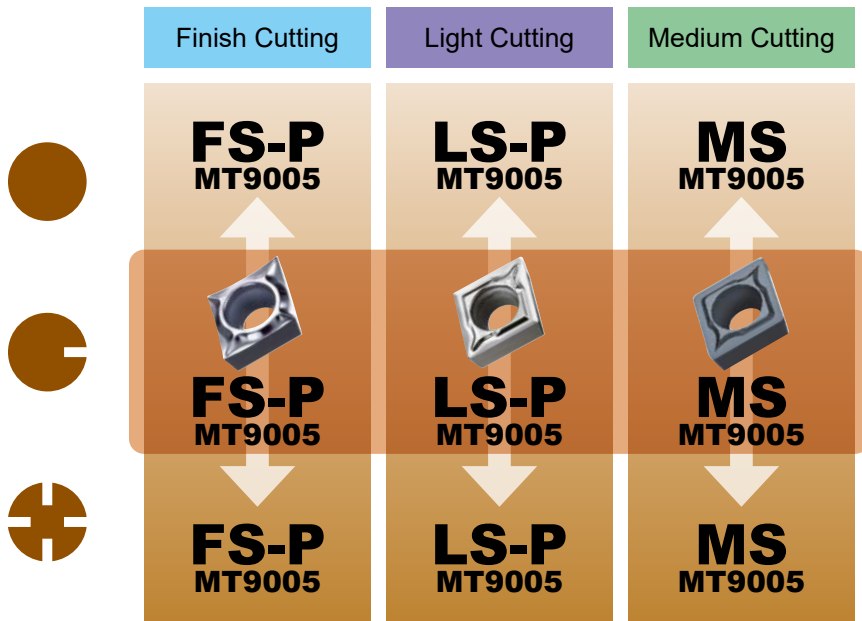


**N** Aluminium Alloy\* (ex. A6061, A7075)  
7° POSITIVE INSERTS WITH HOLE

Vc : Cutting Speed  
f : Feed  
ap : Depth of Cut

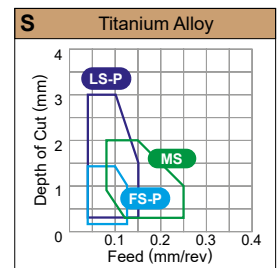
	Cutting Area	Chipbreaker	Grade	1st Recommendation		
				Vc (m/min)	f (mm/rev)	ap (mm)
● Stable Cutting	<b>F</b>	<b>AZ</b>	<b>HTi10</b>	300—700	0.10—0.40	0.20—3.00
◐ General Cutting	<b>F</b>	<b>AZ</b>	<b>HTi10</b>	300—700	0.10—0.40	0.20—3.00
⊕ Unstable Cutting	<b>F</b>	<b>AZ</b>	<b>HTi10</b>	300—700	0.10—0.40	0.20—3.00

\*Please refer to page A093 for other aluminium alloys.



- Stable Cutting
- General Cutting
- Unstable Cutting
- F** Finish Cutting
- L** Light Cutting
- M** Medium Cutting

**A**  
TURNING INSERTS

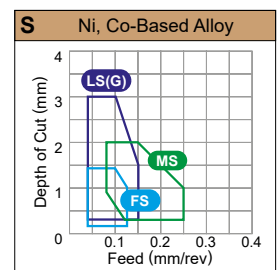
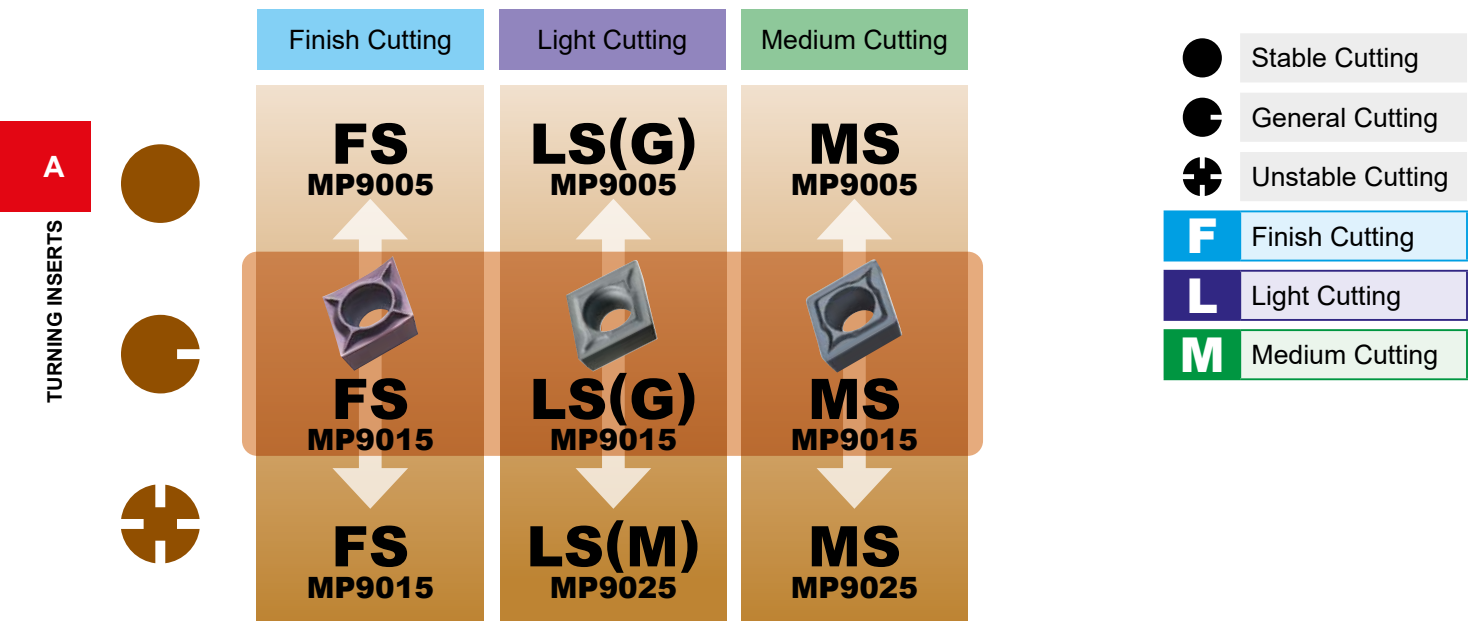


**S** Titanium Alloy (ex. Ti-6Al-4V)  
7° POSITIVE INSERTS WITH HOLE

Vc : Cutting Speed  
f : Feed  
ap : Depth of Cut

	Cutting Area	Chipbreaker	Grade	1st Recommendation		
				Vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	<b>F</b>	<b>FS-P</b>	<b>MT9005</b>	40-80	0.04-0.12	0.20-1.40
	<b>L</b>	<b>LS-P</b>	<b>MT9005</b>	40-80	0.04-0.15	0.30-3.00
	<b>M</b>	<b>MS</b>	<b>MT9005</b>	35-65	0.08-0.25	0.30-2.00
General Cutting	<b>F</b>	<b>FS-P</b>	<b>MT9005</b>	40-80	0.04-0.12	0.20-1.40
	<b>L</b>	<b>LS-P</b>	<b>MT9005</b>	40-80	0.04-0.15	0.30-3.00
	<b>M</b>	<b>MS</b>	<b>MT9005</b>	35-65	0.08-0.25	0.30-2.00
Unstable Cutting	<b>F</b>	<b>FS-P</b>	<b>MT9005</b>	40-80	0.04-0.12	0.20-1.40
	<b>L</b>	<b>LS-P</b>	<b>MT9005</b>	40-80	0.04-0.15	0.30-3.00
	<b>M</b>	<b>MS</b>	<b>MT9005</b>	35-65	0.08-0.25	0.30-2.00

## OPTIMUM GRADES AND CHIPBREAKERS FOR EXTERNAL TURNING

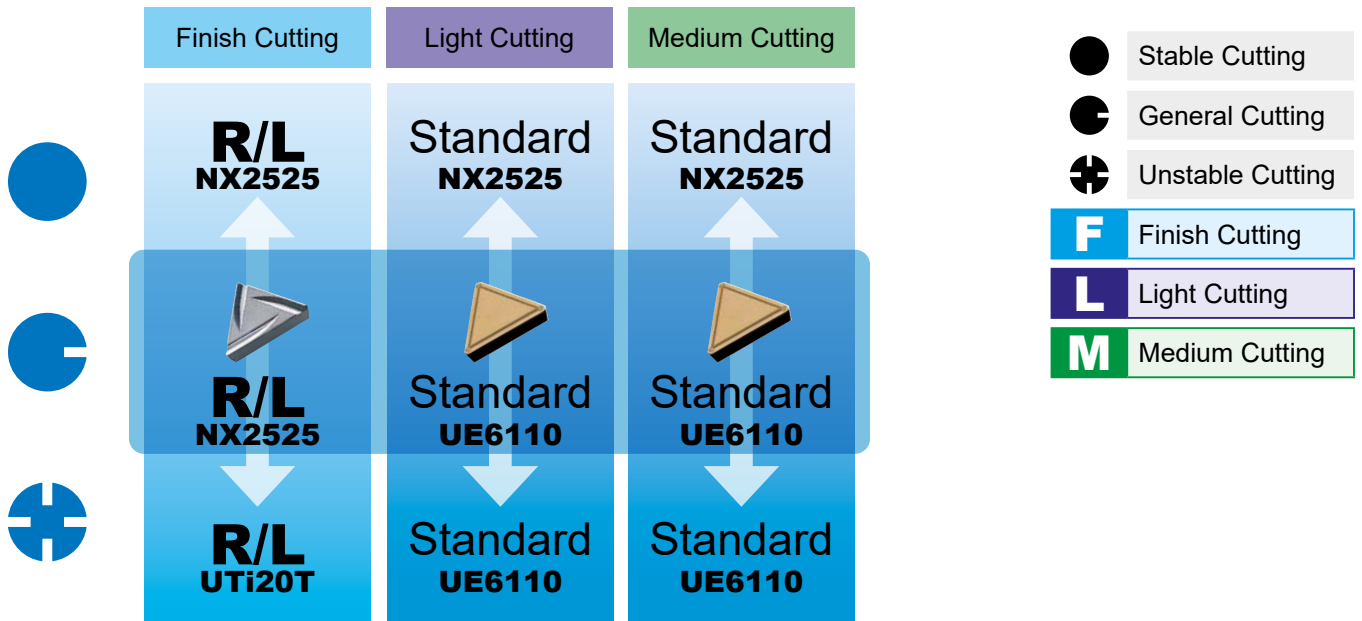


### **S** Ni, Co-Based Alloy\* (ex. Inconel718) 7° POSITIVE INSERTS WITH HOLE

Vc : Cutting Speed  
f : Feed  
ap : Depth of Cut

	Cutting Area	Chipbreaker	Grade	1st Recommendation		
				Vc (m/min)	f (mm/rev)	ap (mm)
● Stable Cutting	<b>F</b>	<b>FS</b>	<b>MP9005</b>	25-95	0.04-0.12	0.20-1.40
	<b>L</b>	<b>LS(G)</b>	<b>MP9005</b>	25-95	0.04-0.15	0.30-3.00
	<b>M</b>	<b>MS</b>	<b>MP9005</b>	20-80	0.08-0.25	0.30-2.00
◐ General Cutting	<b>F</b>	<b>FS</b>	<b>MP9015</b>	20-75	0.04-0.12	0.20-1.40
	<b>L</b>	<b>LS(G)</b>	<b>MP9015</b>	20-75	0.04-0.15	0.30-3.00
	<b>M</b>	<b>MS</b>	<b>MP9015</b>	20-60	0.08-0.25	0.30-2.00
⊕ Unstable Cutting	<b>F</b>	<b>FS</b>	<b>MP9015</b>	20-75	0.04-0.12	0.20-1.40
	<b>L</b>	<b>LS(M)</b>	<b>MP9025</b>	15-25	0.06-0.20	0.20-1.00
	<b>M</b>	<b>MS</b>	<b>MP9025</b>	15-20	0.08-0.25	0.30-2.00

\* G class is recommended for the above FS/LS breaker

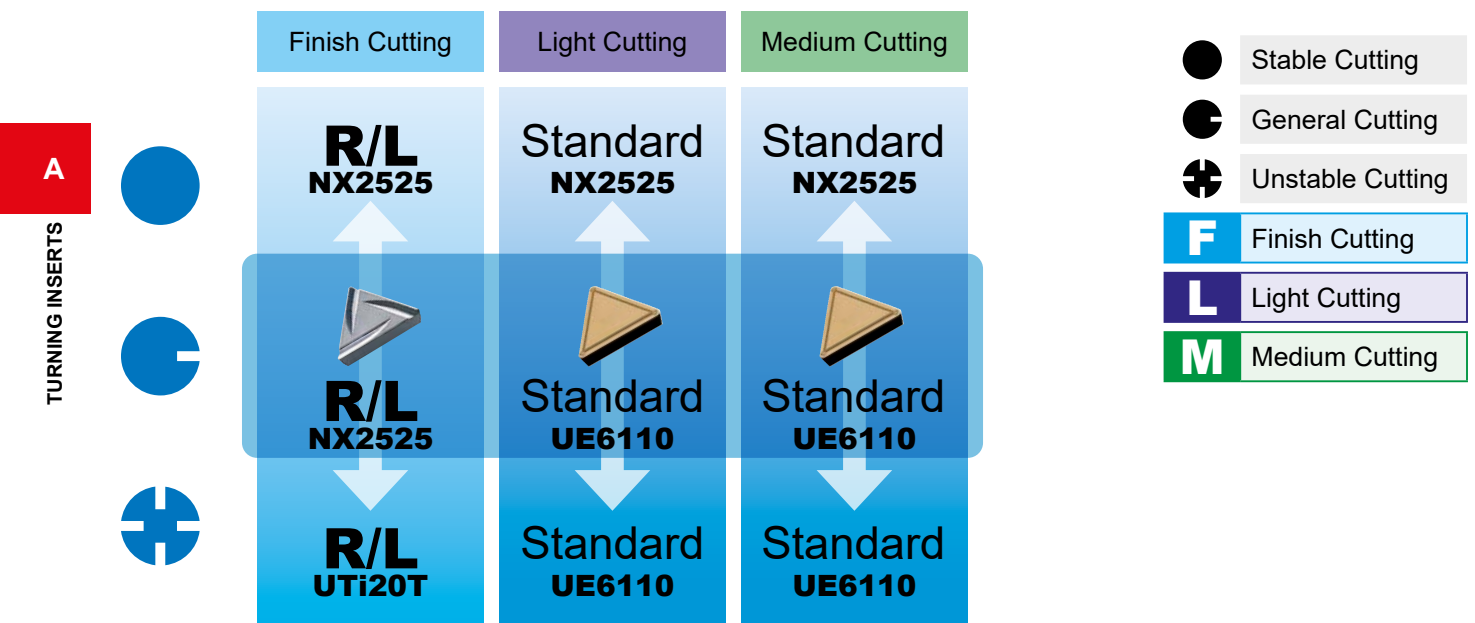


**P** Mild Steel (ex. St37-2, Ck10)  
11° POSITIVE INSERTS WITHOUT HOLE

Vc : Cutting Speed  
f : Feed  
ap : Depth of Cut

	Cutting Area	Chipbreaker	Grade	1st Recommendation		
				Vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	F	R/L	<b>NX2525</b>	225—320	0.05—0.12	0.20—0.60
	L	Standard	<b>NX2525</b>	185—270	0.08—0.30	0.30—2.00
	M	Standard	<b>NX2525</b>	185—270	0.08—0.30	0.30—2.00
General Cutting	F	R/L	<b>NX2525</b>	225—320	0.05—0.12	0.20—0.60
	L	Standard	<b>UE6110</b>	210—355	0.08—0.30	0.30—2.00
	M	Standard	<b>UE6110</b>	210—355	0.08—0.30	0.30—2.00
Unstable Cutting	F	R/L	<b>UTi20T</b>	115—165	0.05—0.12	0.20—0.60
	L	Standard	<b>UE6110</b>	210—355	0.08—0.30	0.30—2.00
	M	Standard	<b>UE6110</b>	210—355	0.08—0.30	0.30—2.00

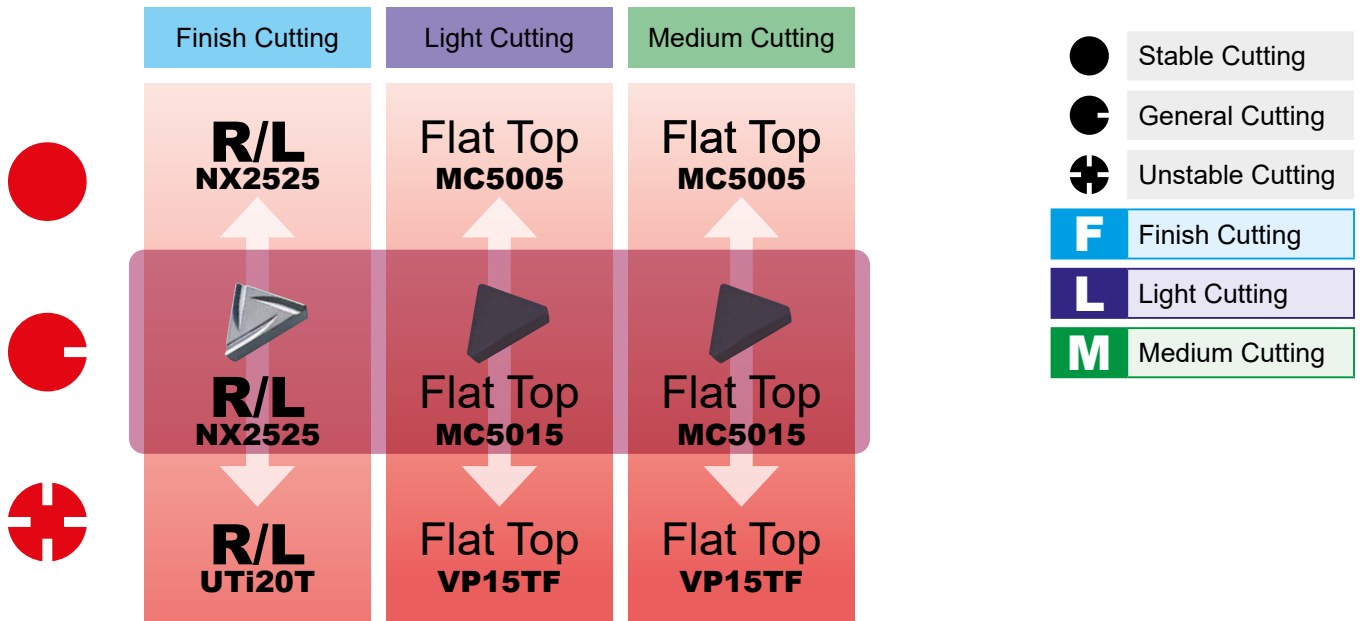
## OPTIMUM GRADES AND CHIPBREAKERS FOR EXTERNAL TURNING



**P** Carbon Steel • Alloy Steel (ex. Ck45, 42CrMo4)  
 11° POSITIVE INSERTS WITHOUT HOLE

Vc : Cutting Speed  
 f : Feed  
 ap : Depth of Cut

	Cutting Area	Chipbreaker	Grade	1st Recommendation		
				Vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	<b>F</b>	<b>R/L</b>	<b>NX2525</b>	165—240	0.05—0.12	0.20—0.60
	<b>L</b>	<b>Standard</b>	<b>NX2525</b>	140—200	0.08—0.30	0.30—2.00
	<b>M</b>	<b>Standard</b>	<b>NX2525</b>	140—200	0.08—0.30	0.30—2.00
General Cutting	<b>F</b>	<b>R/L</b>	<b>NX2525</b>	165—240	0.05—0.12	0.20—0.60
	<b>L</b>	<b>Standard</b>	<b>UE6110</b>	155—260	0.08—0.30	0.30—2.00
	<b>M</b>	<b>Standard</b>	<b>UE6110</b>	155—260	0.08—0.30	0.30—2.00
Unstable Cutting	<b>F</b>	<b>R/L</b>	<b>UTi20T</b>	85—120	0.05—0.12	0.20—0.60
	<b>L</b>	<b>Standard</b>	<b>UE6110</b>	155—260	0.08—0.30	0.30—2.00
	<b>M</b>	<b>Standard</b>	<b>UE6110</b>	155—260	0.08—0.30	0.30—2.00



TURNING INSERTS  
**A**

**K** Cast Iron\* (ex. GG30)  
11° POSITIVE INSERTS WITHOUT HOLE

Vc : Cutting Speed  
f : Feed  
ap : Depth of Cut

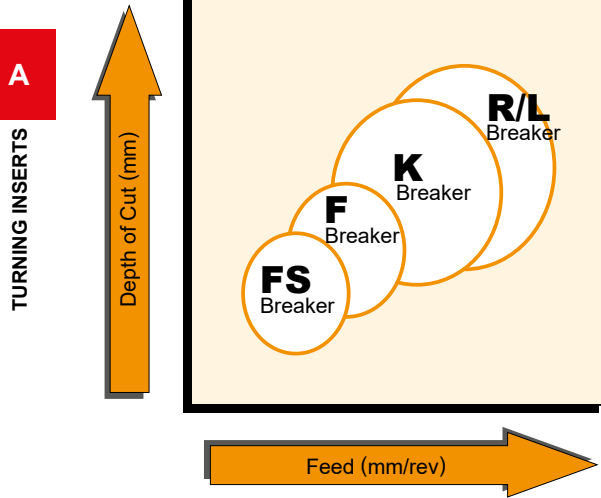
	Cutting Area	Chipbreaker	Grade	1st Recommendation		
				Vc (m/min)	f (mm/rev)	ap (mm)
Stable Cutting	<b>F</b>	<b>R/L</b>	<b>NX2525</b>	145—200	0.05—0.12	0.20—0.60
	<b>L</b>	<b>Flat Top</b>	<b>MC5005</b>	165—265	0.08—0.30	0.30—2.00
	<b>M</b>	<b>Flat Top</b>	<b>MC5005</b>	165—265	0.08—0.30	0.30—2.00
General Cutting	<b>F</b>	<b>R/L</b>	<b>NX2525</b>	145—200	0.05—0.12	0.20—0.60
	<b>L</b>	<b>Flat Top</b>	<b>MC5015</b>	150—240	0.08—0.30	0.30—2.00
	<b>M</b>	<b>Flat Top</b>	<b>MC5015</b>	150—240	0.08—0.30	0.30—2.00
Unstable Cutting	<b>F</b>	<b>R/L</b>	<b>UTi20T</b>	80—115	0.05—0.12	0.20—0.60
	<b>L</b>	<b>Flat Top</b>	<b>VP15TF</b>	115—160	0.08—0.30	0.30—2.00
	<b>M</b>	<b>Flat Top</b>	<b>VP15TF</b>	115—160	0.08—0.30	0.30—2.00

\*Please refer to page A096 for other types of cast iron.




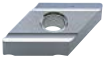



# PRECISION BREAKER SYSTEM

## ANGULAR AND PARALLEL CHIPBREAKERS (NEGATIVE INSERTS)

### CHIP CONTROL RANGE



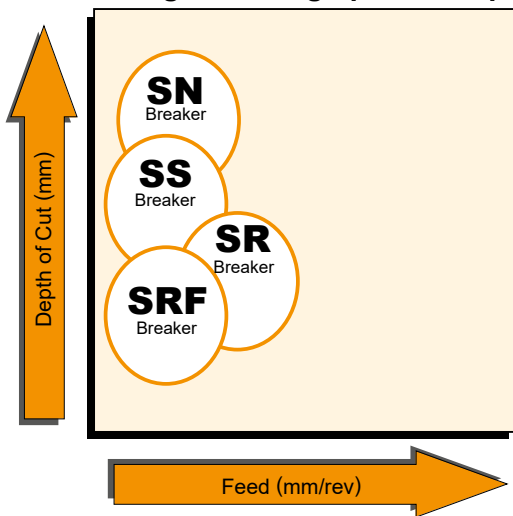
### FEATURES OF CHIPBREAKER

Breaker	Features	DNGG Type	SNGG Type	TNGG Type	VNGG Type
FS	<ul style="list-style-type: none"> <li>● For precision finishing.</li> <li>● Small width lead breaker for good chip control.</li> <li>● Sharp cutting edge gives a good surface finish.</li> </ul>	—	—		—
F	<ul style="list-style-type: none"> <li>● For finish cutting.</li> <li>● Lead breaker controls chip flow.</li> <li>● Sharp cutting edge gives a good surface finish.</li> </ul>	—	—		—
K	<ul style="list-style-type: none"> <li>● Parallel breaker for light cutting.</li> <li>● Excellent chip control for low to medium feed rates.</li> </ul>	—	—		—
R/L	<ul style="list-style-type: none"> <li>● Parallel breaker for medium cutting.</li> <li>● Good chip control for medium feed rates.</li> </ul>				

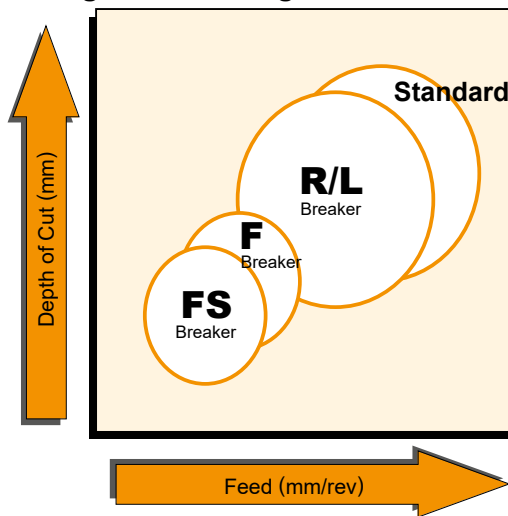


## ANGULAR AND PARALLEL CHIPBREAKER

■ For turning small, high precision parts



■ For general turning



### FEATURES OF CHIPBREAKER

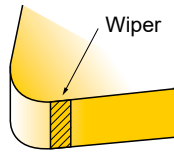
Breaker	Features	CCET Type	CCGT Type	DCET Type	DCGT Type	VBET Type
SRF	<ul style="list-style-type: none"> <li>The wide lead breaker for medium cutting is suitable for automatic lathe machining.</li> <li>The insert designed for low resistance controls chip flow.</li> </ul>	—	—	—		
SR	<ul style="list-style-type: none"> <li>The wide lead breaker for medium cutting is suitable for automatic lathe machining.</li> <li>The insert designed for low resistance controls chip flow.</li> </ul>		—		—	
SS	<ul style="list-style-type: none"> <li>The parallel breaker for light cutting is suitable for automatic lathe machining.</li> <li>Excellent chip control at low feed rates.</li> </ul>	—		—		—
SN	<ul style="list-style-type: none"> <li>The parallel breaker for general purpose is suitable for automatic lathe machining.</li> <li>Excellent chip control for low to medium feed rates.</li> </ul>					

Breaker	Features	CCGH/CCGT Type	CPGT Type	DCGT Type	TPGH Type	TCGT Type	VBGT/VCGT Type	WBGT Type	WCGT Type	WPGT Type
FS	<ul style="list-style-type: none"> <li>For precision finishing.</li> <li>Small width lead breaker for excellent chip control.</li> <li>Sharp cutting edge gives a good surface finish.</li> </ul>	—	—	—		—	—	—	—	
F	<ul style="list-style-type: none"> <li>For finish cutting.</li> <li>Lead breaker controls chip flow.</li> <li>Sharp cutting edge gives a good surface finish.</li> </ul>				—				—	—
R/L	<ul style="list-style-type: none"> <li>Lead breaker for light cutting.</li> <li>Good chip control for low to medium feed rates.</li> </ul>	—	—	—	—	—	—	—		—
Standard	<ul style="list-style-type: none"> <li>For light cutting.</li> <li>Good chip control for low to medium feed rates.</li> </ul>	—		—	—	—	—	—	—	—

# WIPER INSERT

## What is a Wiper Insert?

- The wiper insert is designed with a wiper edge that is situated where the straight edge meets the corner radius.
- In comparison to conventional breakers, the surface finish does not deteriorate even if the feed rate is doubled.
- Machining at high feed rates improves cutting efficiency.



## ● Improving Surface Finish

Under the same machining conditions as conventional breakers, but with the feed rate increased, the surface finish of the workpiece can be improved.

## ● Improving Efficiency

High feed rates not only shorten machining times but also make it possible to combine roughing and finishing operations.

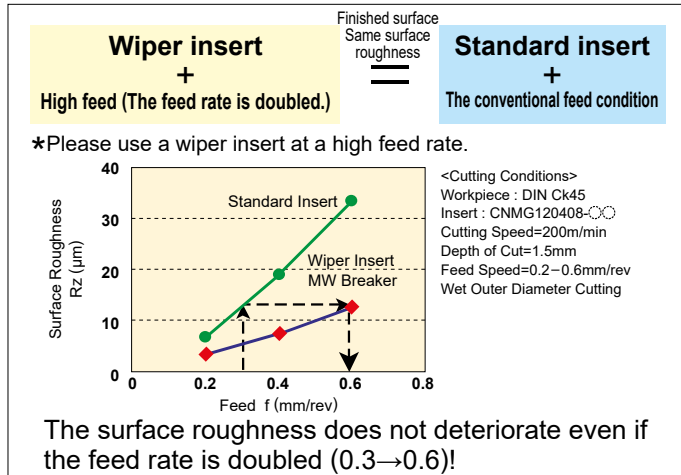
## ● Increased Tool Life

When using to high feed conditions, the time required to cut one component is decreased, thus more parts can be machined with each insert. In addition, the high feed rate prevents rubbing, therefore, delaying the progression of wear and increasing the tool life of the insert.

## ● Improving Chip Control

Under high feed conditions, the chips generated become thicker and are more easily broken, thus, chip control is improved.

TURNING INSERTS



## ■ A wiper insert + machining at high feed rate

- Reduced machining time (per workpieces)
- Increased number of workpieces (per definitive time period)
- Improving chip control

## ■ A wiper insert + machining at conventional feed rate

- Eliminating the finishing step by roughing and finishing together (Separate roughing and finishing steps → Single-step machining)

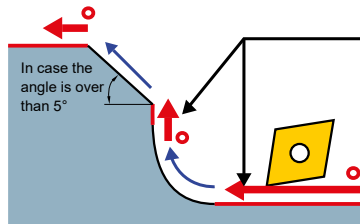
- Reducing cycle times
- Increased productivity
- Avoiding Line-Stoppage

## The realisation of Reduced Costs!!

## ■ Estimating the finished surface roughness when using a wiper insert

The effects of wiper inserts on external machining, boring and facing.

★The surface roughness when machining at a corner R or taper angle over 5°, is the same as machining with standard inserts.



$$Rz(W) = Rz \times 0.5$$

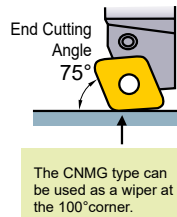
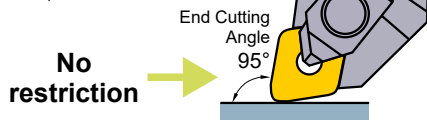
$Rz(W)$  = Finished surface roughness when using a wiper insert.  
 $Rz$  : Finished surface roughness from conventional conditions. (When using a standard insert)

- Effective usage of a wiper insert
- Non effective usage of a wiper insert

## ■ Special attention is not necessary when using CNMG • WNMG • CCMT types

### ● No Restriction for Holders

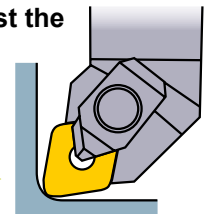
A standard holder can be used. (★A double clamp, high rigidity tool is recommended.)



### ● Not Necessary to Adjust the Machining Programme

Conventional machining programmes can be used. (The CNMG • WNMG • CCMT types are based on the ISO/ANSI.)

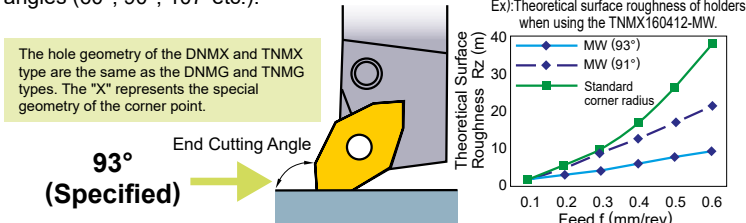
Not necessary to adjust



## ■ Special attention is necessary when using the DNMX • TNMX types due to the special top face geometry

### ● Restriction for Holders

Use a holder with an end cutting angle of 93° for improving wiper efficiency. A holder with an end cutting angle of 91° can improve wiper efficiency (see the following figure), however, there is no wiper efficiency with other end cutting angles (60°, 90°, 107° etc.).

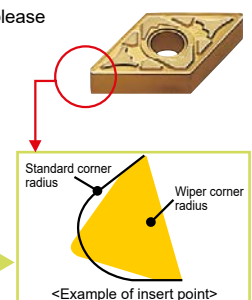


### ● Necessary to Adjust the Machining Programme

When machining errors occur, please adjust the programme.

(The DNMX-TNMX types are not based on the ISO/ANSI. Please refer to the next page.)

Adjustment necessary



## ■ Adjustment of machining programmes for DNMX • TNMX types

**Basic Process) Adjusting Toward X-axis and Z-axis**  
Adjusting the differential between a standard insert and Z-axis / X-axis.

**Adjustment toward X-axis**

Standard insert      DNMX, TNMX type

Corner radius 0.4, 0.8: **0.04 mm**  
Corner radius 1.2 : **0.05 mm**

**Adjustment toward Z-axis**

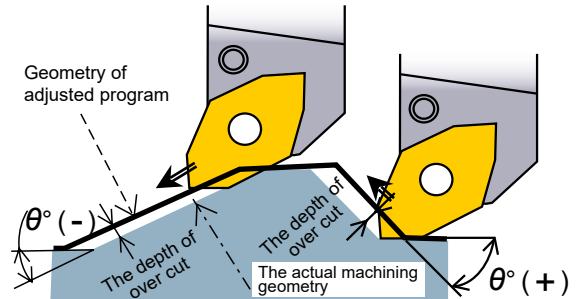
Standard insert      DNMX, TNMX type

(Not closed to Corner R) **0.01mm**

### A) Adjusting a Taper \*Necessary to maintain a correct taper.

Adjust the relief angle toward the normal line.

Note 1) Adjust the angle toward the normal line in the case where the adjustment number is minus ( $\theta = 60^\circ - 70^\circ$ ) and is not machined completely.



### Classification

Corner radius	Taper Angle $\theta^\circ$															
	-25--15	-10	-5	0	5	10	15	20-35	40	45	50	55	60-65	70	75-85	90
1.2	0.04	0.03	0.01	0	0.02	0.03	0.04	0.05	0.04	0.04	0.02	0.01	-0.01	0	0.01	0
0.8	0.03	0.02	0.01	0	0.01	0.02	0.03	0.04	0.03	0.03	0.02	0	-0.01	0	0.01	0
0.4	0.02	0.01	0.01	0	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0	-0.01	-0.01	0	0

The number  $\rightarrow$  +numbers: adjustment of relief angle, -numbers: adjustment of drive-in angle (mm)

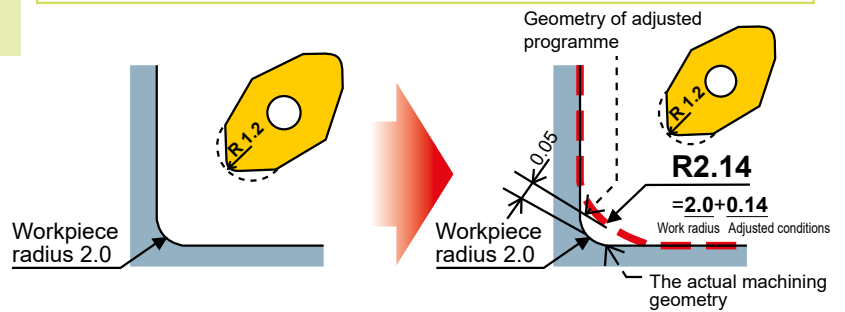
### B) Adjusting a Corner R \*Necessary to maintain a correct corner radius.

Adjust the work diameter to the same as the taper to prevent over-cut.

**The value of adjustment to workpiece R = Workpiece R + the adjustment value**  
\*No adjustment of the corner radius in this case.

Ex : In case of machining R 2.0 when using a corner R 1.2 type insert.

The corner radius of the insert	The adjustment amount on the workpiece radius.
Corner Radius 0.4 $\rightarrow$	Work Radius + <b>0.05(mm)</b>
Corner Radius 0.8 $\rightarrow$	Work Radius + <b>0.11(mm)</b>
Corner Radius 1.2 $\rightarrow$	Work Radius + <b>0.14(mm)</b>



**When correcting corner radius:**

It is not necessary to adjust the machining programme, however, machining errors can occur within max.  $\pm 0.03\text{mm}$  due to corrections by an approximate number.

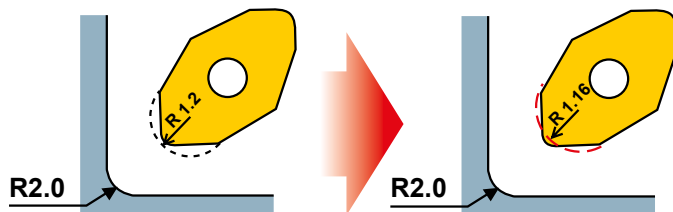
### The Easy-to-correct Method

**Corner Radius Correction** Input the correction number of each corner radius.

**The value of corrected corner radius = approximation**  
\*No need to adjust the programme in this case.

Ex : In the case of machining a corner with a radius R 2.0 when using an insert with a corner radius R 1.2.

The corner radius of the insert	The value of corrected corner radius = approximation
Corner Radius 0.4 $\rightarrow$	<b>R0.36(mm)</b>
Corner Radius 0.8 $\rightarrow$	<b>R0.76(mm)</b>
Corner Radius 1.2 $\rightarrow$	<b>R1.16(mm)</b>



Others : The value of correction is same for both DNMX and TNMX. Differentiate between them by the size of corner radius.

# GRADES FOR TURNING

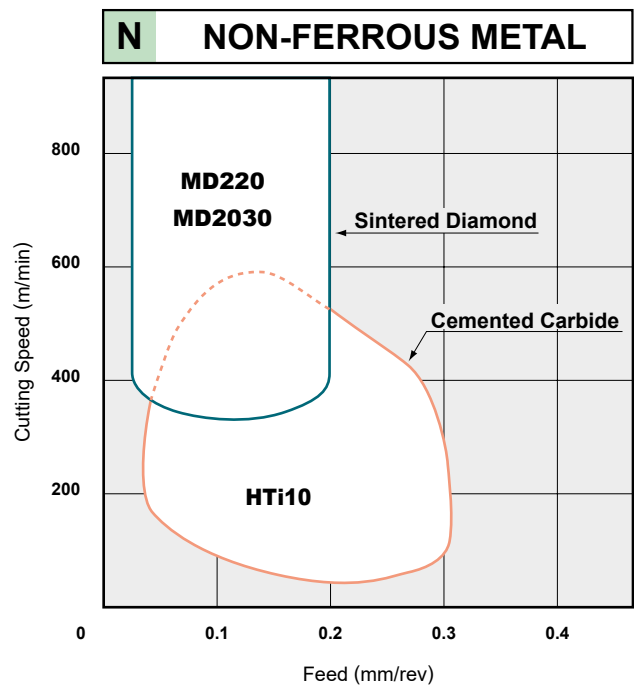
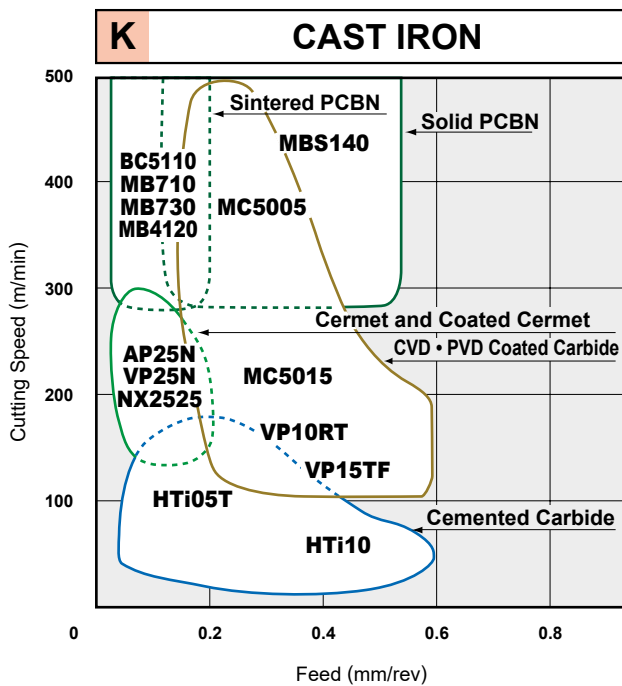
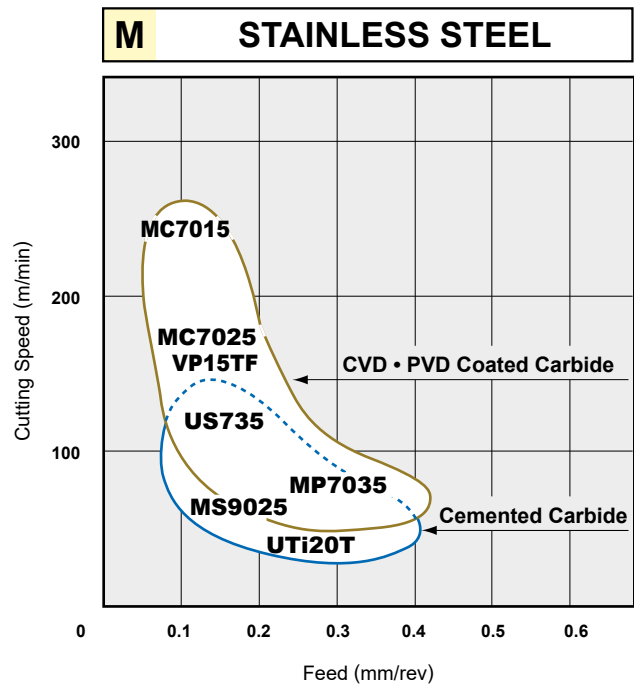
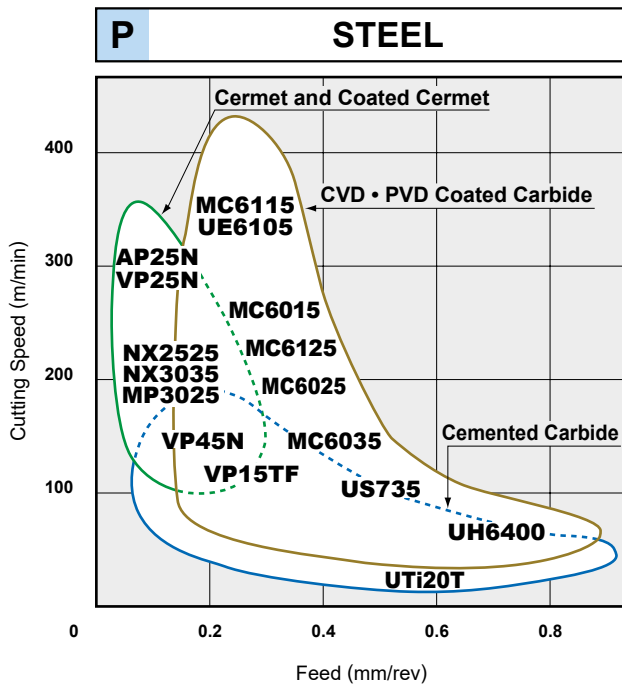
● INDEXABLE INSERT GRADES FOR TURNING

TURNING INSERTS

A

ISO	Coated Carbide		Cermets	Coated Cermet	Cemented Carbide	Coated PCBN	PCBN	PCD (Sintered Diamond)
	CVD	PVD						
Steel P	10	MC6115 <sup>NEW</sup> , UE6105, MC6015, MY5015						
	20	MC6125 <sup>NEW</sup> , MC6025, VP10RT, VP10MF, MS6015	NX2525, NX3035	AP25N, VP25N				
	30	MC6035, UH6400, VP15TF, VP20MF, VP20RT, UP20M		MP3025, VP45N	UTi20T			
	40							
Stainless Steel M	10	MC7015, US7020		AP25N, VP25N				
	20	MC7025, VP10RT, VP10MF, MS9025 <sup>NEW</sup>	NX2525					
	30	MC7025, VP15TF, VP20MF, VP20RT, UP20M						
	40	US735, MP7035			UTi20T			
Cast Iron K	10	MC5005, MC5015, MY5015, MH515 <sup>NEW</sup>		AP25N, VP25N	HTi05T			
	20	VP10RT, VP15TF, VP20RT	NX2525		HTi10	BC5110 <sup>NEW</sup>	MB710	
	30				UTi20T		MB730, MIB4120, MIBS140	
	40							
Non-Ferrous Metal N	10							
	20				HTi10			MD220
	30							MD2030
	40							
Heat Resistant Alloy • Ti Alloy G	10	US905			MT9005, RT9005		MB730	
	20	MP9005, VP05RT, MP9015, VP10RT			MT9015, RT9010			
	30	MP9025 <sup>NEW</sup> , VP20RT, MS9025 <sup>NEW</sup>						
	40							
Hardened Steel H	10					BC8105, BC8110, BC8210 <sup>NEW</sup> , BC8120, BC8220 <sup>NEW</sup> , BC8130	MB8110 <sup>NEW</sup> , MB8120 <sup>NEW</sup> , MIB8130 <sup>NEW</sup>	
	20							
	30							
	40							

# TURNING APPLICATION RANGE

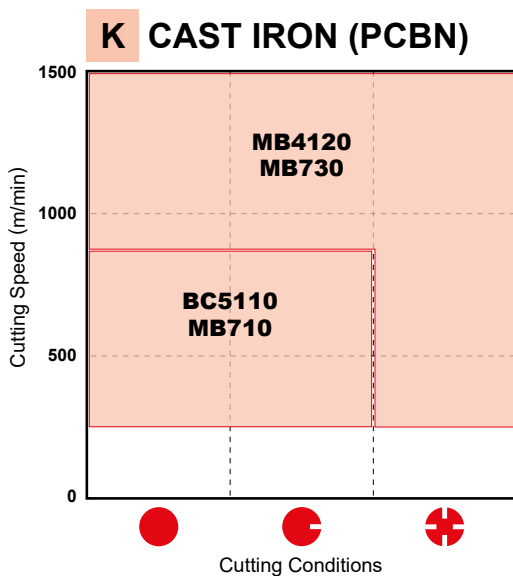
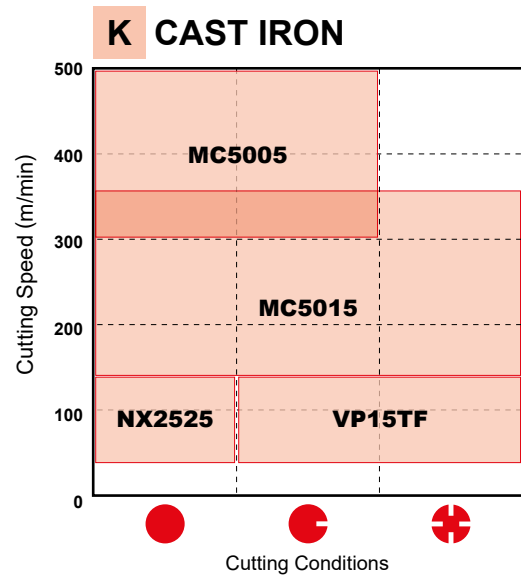
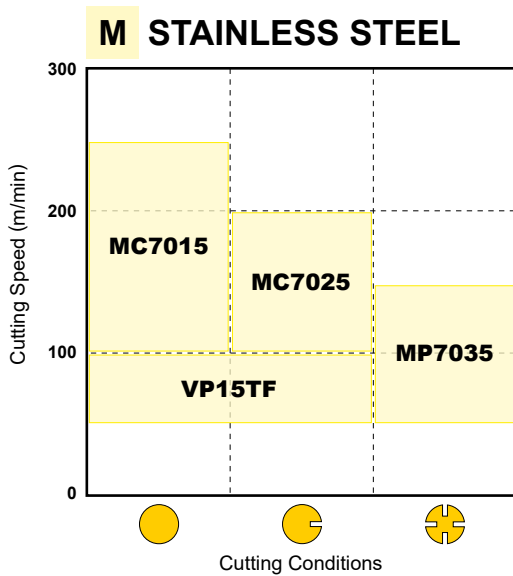
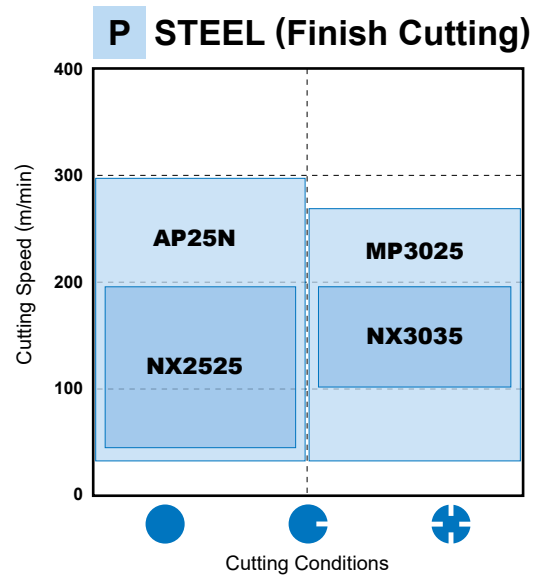
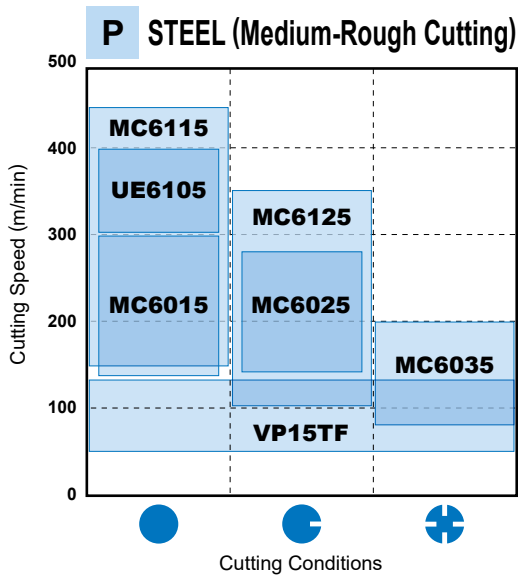


# TURNING APPLICATION RANGE

● Recommended insert grade based on cutting speed and conditions for each workpiece material.

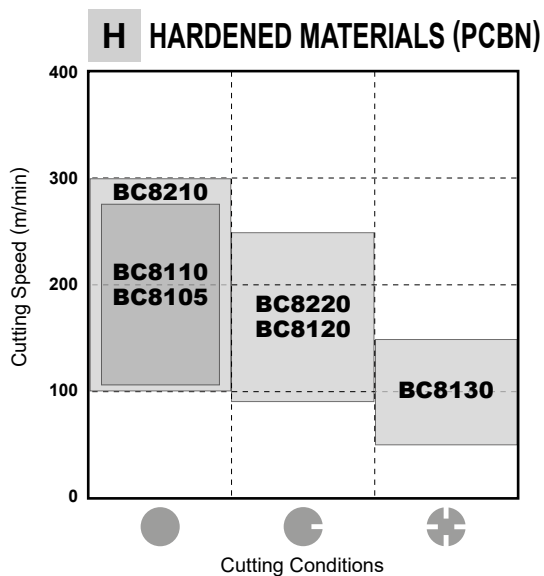
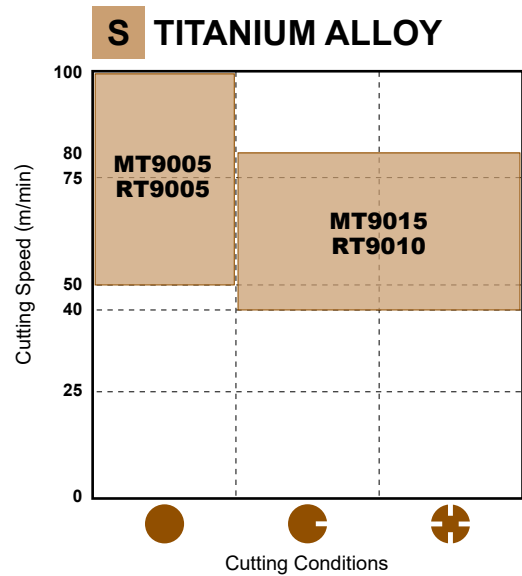
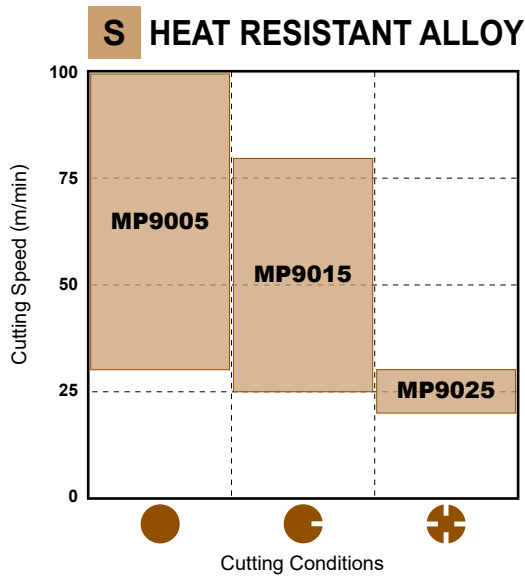
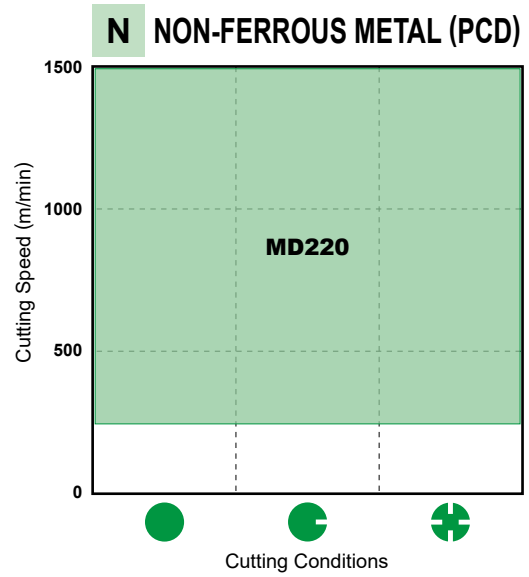
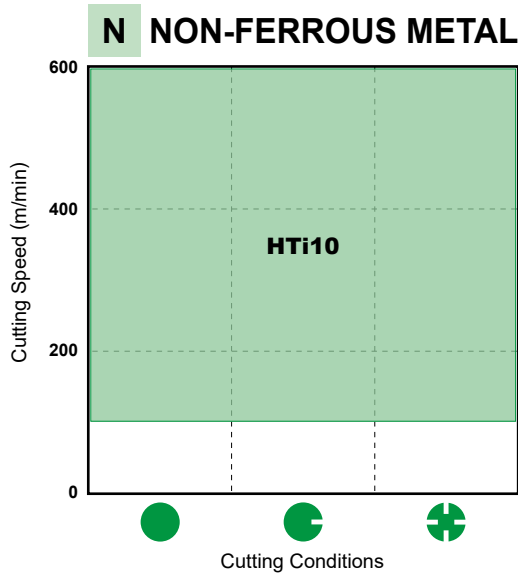
A

TURNING INSERTS



## CUTTING CONDITIONS

- Stable Cutting**  
 Continuous Cutting  
 Constant Depth of Cut  
 Pre-Machined  
 Securely Clamped Component Cutting
- General Cutting**
- Unstable Cutting**  
 Heavy Interrupted Cutting  
 Irregular Depth of Cut  
 Low Clamping Rigidity Cutting



A

TURNING INSERTS

# COATED CARBIDE (CVD)

- Special tough fibrous structure improves wear and fracture resistance.
- Covers a wide application range and thus reduces the number of tools required.

## SELECTION STANDARD

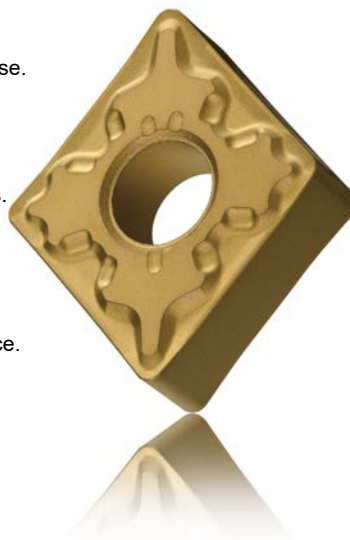
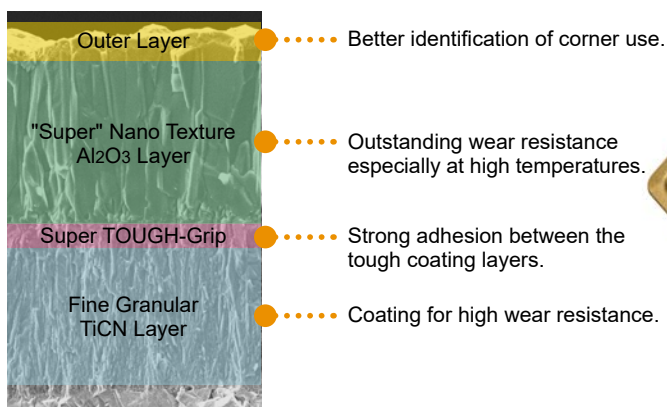
### TURNING

TURNING INSERTS

Work Material	Cutting Mode	Recommended Grade	Recommended Cutting Speed (m/min)	ISO	Application Range
Steel	Continuous Cutting	UE6105	300 (200 – 400)	P	
		MC6115	300 (150 – 450)		
	Interrupted Cutting	MC6125	200 (100 – 350)		
		MC6035	150 (80 – 200)		
Stainless Steel	Continuous Cutting	MC7015	200 (160 – 250)	M	
		MC7025	150 (120 – 200)		
	Continuous and Interrupted Cutting	US735	100 (80 – 120)		
Cast Iron Ductile Cast Iron	Continuous Cutting	MC5005	300 (200 – 400)	K	
	Interrupted Cutting	MC5015	250 (150 – 300)		
Heat Resistant Alloy	Continuous and Interrupted Cutting	US905	80 (50 – 100)	S 5	

Dramatic increase in stability and wear resistance, enabled by utilising the improved coating adhesion and crystal orientation technology.

## MC6115



### Super Nano Texture Technology

The standard Nano Texture Technology has been improved and developed to be an industry leading standard for crystal growth of Al<sub>2</sub>O<sub>3</sub> coatings. This Super Nano Texture Technology increases tool life and wear resistance due to the fine, dense crystal growth process.

### Super TOUGH-Grip

The Super TOUGH-Grip layer has finer crystal grains that enhance the strength of the adhesion between the coating layers.



## ■ GRADE CHARACTERISTICS

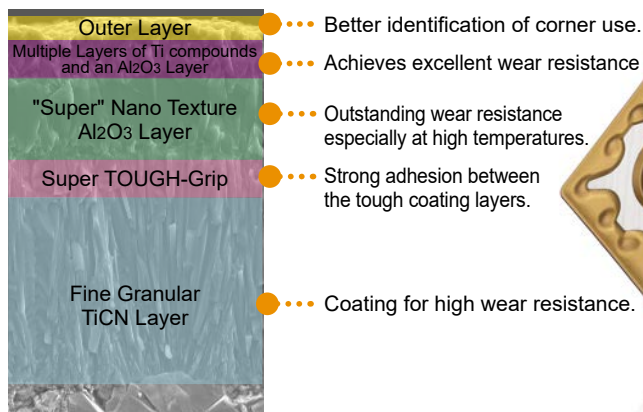
Work Material	Grade	Substrate	Coating Layer	
		Hardness (HRA)	Composition	Thickness
P Steel	<b>UE6105</b>	90.8	Accumulated TiCN-Al <sub>2</sub> O <sub>3</sub> -TiN Compound	
	<b>MC6115</b>	90.8	Accumulated TiCN-Al <sub>2</sub> O <sub>3</sub> -TiN Compound	
	<b>MC6015</b>	90.2	Accumulated TiCN-Al <sub>2</sub> O <sub>3</sub> -TiN Compound	
	<b>MC6125</b>	90.0	Accumulated TiCN-Al <sub>2</sub> O <sub>3</sub> -TiN Compound	
	<b>MC6025</b>	90.2	Accumulated TiCN-Al <sub>2</sub> O <sub>3</sub> -TiN Compound	
	<b>MC6035</b>	89.5	Accumulated TiCN-Al <sub>2</sub> O <sub>3</sub> -TiN Compound	
	<b>UH6400</b>	89.5	Accumulated TiCN-Al <sub>2</sub> O <sub>3</sub> -TiN Compound	
M Stainless Steel	<b>MC7015</b>	90.7	TiCN-Al <sub>2</sub> O <sub>3</sub> -TiN	
	<b>US7020</b>	90.5	TiCN-Al <sub>2</sub> O <sub>3</sub> -TiN	
	<b>MC7025</b>	89.4	TiCN-Al <sub>2</sub> O <sub>3</sub> -TiN	
	<b>US735</b>	89.0	TiN Compound	
K Cast Iron Ductile Cast Iron Heat Resistant Cast Steel	<b>MC5005</b>	91.0	TiCN-Al <sub>2</sub> O <sub>3</sub>	
	<b>MC5015</b>	91.0	TiCN-Al <sub>2</sub> O <sub>3</sub>	
	<b>MH515</b>	91.0	TiCN-Al <sub>2</sub> O <sub>3</sub>	
S Heat Resistant Alloy	<b>US905</b>	92.2	TiCN-Al <sub>2</sub> O <sub>3</sub> -TiN	

Note 1) Hardness shows representative value of the substrate.

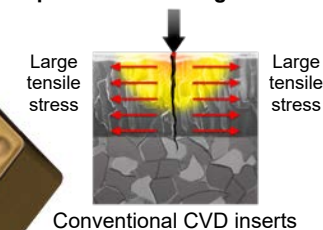
### Strengthened chipping resistance

Cracks that occur during unstable machining are prevented due to the relaxing of the tensile stress in the coating. MC6100 series has an 80% reduction in coating tensile stress compared to conventional CVD inserts.

## MC6125

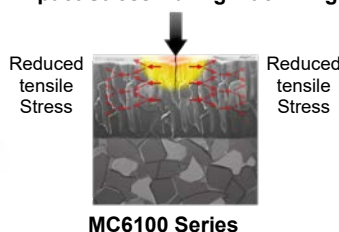


### Impact Stress During Machining



Cracks are generated in the surface of coatings during machining. They propagate through the coating into the substrate due to the large tensile stress in the coating structure. This creates one of the main causes of sudden insert breakage.

### Impact Stress During Machining



MC6100 series has a much lower level of stress than conventional CVD coatings due to the surface treatment. This divides the force of impacts during machining and protects from sudden fracturing.

Relaxing of the Tensile Stress

# COATED CARBIDE (PVD)

- PVD coating prolongs tool life under the same cutting conditions compared to uncoated carbide.
- Coating of tools with sharp edges is possible without softening or changing the quality of the substrate.

**SELECTION STANDARD**

**TURNING**

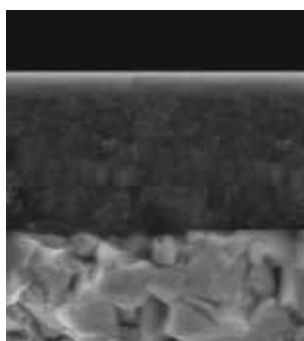
TURNING INSERTS

Work Material	Recommended Grade	Recommended Cutting Speed (m/min)	ISO	Application Range
P Steel	VP10RT	120 (100 – 150)	P 10 20 30 40	
	VP15TF	120 (100 – 150)		
	UP20M	120 (100 – 150)		
M Stainless Steel	VP10RT	120 (100 – 150)	M 10 20 30 40	
	VP15TF	120 (100 – 150)		
	VP20MF	120 (100 – 150)		
	UP20M	120 (100 – 150)		
K Cast Iron	VP10RT	120 (100 – 150)	K 10 20 30	
	VP15TF	120 (100 – 150)		
	VP20RT	120 (100 – 150)		
S Heat Resistant Alloy	MP9005	60 (30 – 100)	S 10 20 30	
	MP9015	50 (25 – 80)		
	MP9025	25 (20 – 30)		

## ISO Turning Inserts for Difficult to Cut Materials

**NEW**

### MP9005/MP9015/MP9025



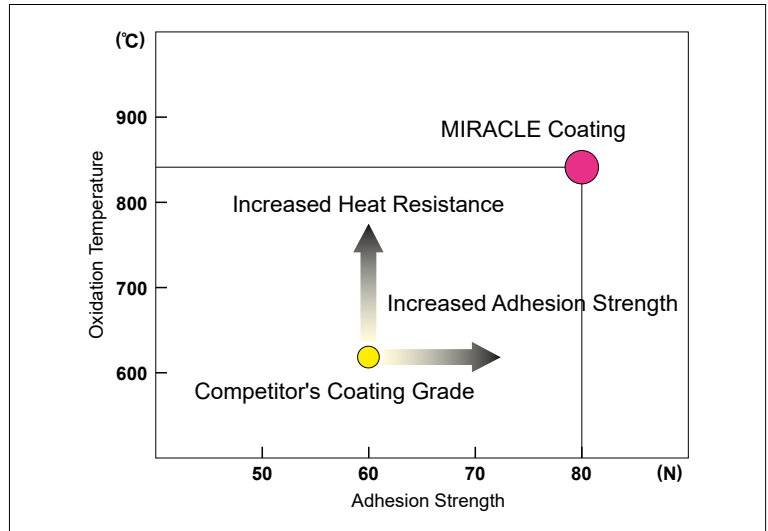
High Al-(Al,Ti)N single layer coating

Special carbide substrate

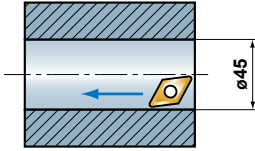
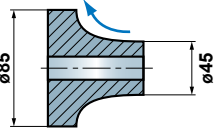
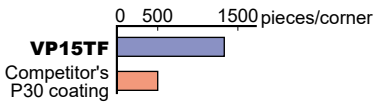
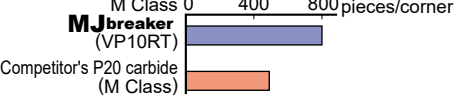
ISO Grade	Grade	Concept	Application
S01	<b>MP9005</b>	Top-quality grade focusing on wear resistance	Heat Resistant Alloy Finish-Medium Cutting
S10	<b>MP9015</b>	First recommendation for general applications	Heat Resistant Alloy Medium-Rough Cutting
S30	<b>NEW MP9025</b>	Prevents severe damage for increased stability.	Heat Resistant Alloy Interrupted • Light-Rough Cutting

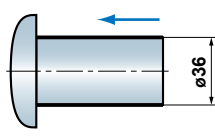

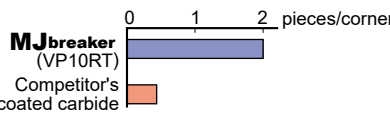
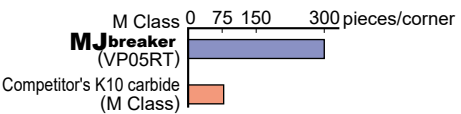
## FEATURES OF VP (MIRACLE) COATING

Compared to conventional coating technology, VP (MIRACLE) coating features (Al,Ti)N coating with an increased heat resistance and adhesion strength.



## APPLICATION EXAMPLES

Insert (Grade)		DCMT11T304-MV(VP15TF)	CNMG120408-MJ(VP10RT)
Workpiece		Alloy steel 	Stainless Steel (Fan parts) 
Cutting Conditions	Cutting Speed (m/min)	170	200
	Feed (mm/rev)	0.14	0.25
	Depth of Cut (mm)	0.25	0.5
	Coolant	Wet cutting	Wet cutting
Result		 <p>The VP15TF type did not suffer from edge chipping. This enables stable machining and much longer tool life.</p>	 <p>MJ breaker achieved 1.5 times longer tool life.</p>

Insert (Grade)		CNMG120408-MJ(VP10RT)	TNMG160408-MJ(VP05RT)
Workpiece		Inconel 718 (Pin) 	Sintered iron parts (FH655) 
Cutting Conditions	Cutting Speed (m/min)	31	120
	Feed (mm/rev)	0.2	0.05
	Depth of Cut (mm)	2.3	0.5
	Coolant	Wet cutting	Wet cutting
Result		 <p>VP10RT achieved 4 times longer tool life. MJ breaker for excellent chip disposal and vastly increased tool life.</p>	 <p>MJ breaker achieved 5 times longer tool life.</p>

# CERMET

- The optimized alloy structure and special alloy binder improves both wear and fracture resistance.
- It covers a wide application range and reduces the number of tools required.
- NX3035 for wet cutting.
- NX2525 for dry cutting.

A

TURNING INSERTS

## SELECTION STANDARD

### TURNING

Work Material	Cutting Mode	Recommended Grade	Recommended Cutting Speed (m/min)	ISO	Application Range
P Steel	Continuous Cutting	<b>NX2525</b>	220 (180 – 250)	P 10 20	
	Interrupted Cutting	<b>NX3035</b>	200 (190 – 260)		
K Cast Iron Ductile Cast Iron	Finishing	<b>NX2525</b>	180 (150 – 210)	K 10 20	

## GRADE CHARACTERISTICS

Grade	Hardness (HRA)
<b>NX2525</b>	92.2
<b>NX3035</b>	91.5

Note 1) Hardness shows representative value of the substrate.

# COATED CERMET

● Coated cermet (PVD coating) has superior wear and fracture resistance, and therefore provides a stable cutting performance.

## ■ SELECTION STANDARD

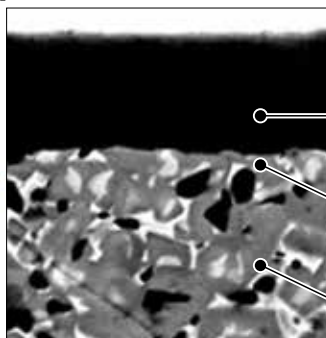
### ● TURNING

Work Material	Cutting Mode	Recommended Grade	Recommended Cutting Speed (m/min)	ISO	Application Range
P Steel	Continuous Cutting	VP25N AP25N	240 (190 – 290)	P 10 20 30	VP25N, AP25N
	Interrupted Cutting	MP3025	230 (180 – 280)		MP3025, VP45N
K Cast Iron Ductile Cast Iron	Finishing	VP25N AP25N	160 (110 – 230)	K 10 20	VP25N, AP25N

Effective for production of small parts.

## MP3025

MP3025 provides improved adhesion of the coating layer due to the newly-developed special substrate. Uniform flank wear allows prolonged machining and maintains excellent surface finishes.



Ti-compound PVD coating provides excellent wear and welding resistance.

Substrate surface provides excellent adhesion strength for coating layer.

Substrate with superior fracture resistance and thermal shock resistance.

# CEMENTED CARBIDE

● UTi grades are available for steel and cast iron. HTi grades are available for non-ferrous and non-metal materials and are also suitable for cast iron.

## SELECTION STANDARD

### TURNING

TURNING INSERTS

Work Material	Recommended Grade	Recommended Cutting Speed (m/min)	ISO	Application Range
P Steel	UTi20T	100 (60 – 130)	10	UTi20T
			20	
			30	
M Stainless Steel	UTi20T	100 (60 – 130)	10	UTi20T
			20	
			30	
K Cast Iron	HTi05T	120 (80 – 150)	10	HTi05T
	HTi10	100 (50 – 150)	20	HTi10
	UTi20T	100 (50 – 150)	30	UTi20T
N Non-Ferrous Metal	HTi10	300 (100 – 600)	10	HTi10
S Heat-resistant Alloy Ti Alloy	MT9005 RT9005	70 (50 – 100)	10	MT9005 RT9005
	MT9015 RT9015	60 (40 – 80)	20	MT9015 RT9015

## MAIN COMPONENT AND APPLICATION

ISO	Main Component	Characteristics	Work Material
P M	WC-TiC-TaC-Co	Heat / deformation resistance.	Carbon steel, alloy steel, stainless steel and cast iron
K N	WC-Co	High rigidity and wear resistance.	Cast iron, non-ferrous metals, and non-metal
S	WC-Co	High heat resistance and wear resistance.	Heat-resistant alloy, Ti alloy

## GRADE CHARACTERISTICS

ISO	Grade	Hardness (HRA)
P M	UTi20T	90.5
K N	HTi05T	92.5
	HTi10	92.0
S	MT9005/RT9005	92.2
	MT9015/MT9010	91.8

Note 1) Hardness shows representative value of the substrate.

# Memo

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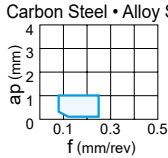

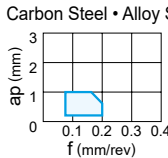

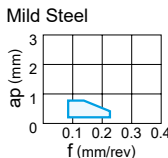
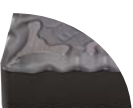
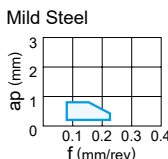

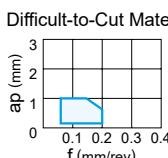

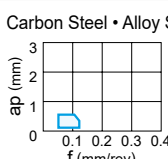

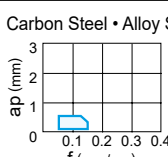

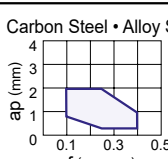

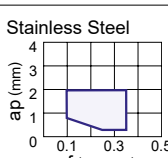
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# CLASSIFICATION

## NEGATIVE INSERTS WITH HOLE

TURNING INSERTS

A

Application	Tolerance	Breaker Name and Picture	Features		Cross Section Geometry	
Finish Cutting	M	<b>FP</b> 	<b>First recommendation for finish cutting of carbon steel and alloy steels</b> Controls chip clogging during high-feed cutting and prevents chips of soft work materials from running onto their surfaces. Large rake angle controls vibrations and work deformation when machining low-rigidity workpieces.	Carbon Steel • Alloy Steel 	20° <b>Corner</b> 20° <b>Flank</b> CNMG120408-FP	
		<b>FH</b> 	<b>First recommendation for finish cutting of carbon steel and alloy steels</b> Double sided chipbreaker. Stable chip control even at small depth of cut.	Carbon Steel • Alloy Steel 	12° <b>Corner</b> 12° <b>Flank</b> CNMG120408-FH	
		<b>FS</b> 	<b>Alternative chipbreaker for finish cutting of mild steel</b> Stable chip control even at small depth of cut. Sharp edge gives best performance.	Mild Steel 	16° <b>Corner</b> 8° <b>Flank</b> CNMG120408-FS	
		<b>FY</b> 	<b>First recommendation for finish cutting of mild steel</b> Effectively controls adhesive chips. Suitable for mild steel finishing.	Mild Steel 	15° <b>Corner</b> 15° <b>Flank</b> 0.2 mm CNMG120408-FY	
	G	<b>FJ</b> 	<b>Alternative chipbreaker for finish cutting of difficult-to-cut materials</b> Ideal for heat-resistant alloy and titanium alloy. The sharp edge produces good cutting surface. The curved edge allows smooth chip discharge.	Difficult-to-Cut Materials 	14° <b>Corner</b> 9° <b>Flank</b> CNGG120404-FJ	
		<b>R/L-FS</b> 	<b>Precise finishing</b> A narrow lead chipbreaker for good chip control. The sharp edge produces a good surface finish.	Carbon Steel • Alloy Steel 	14° <b>Flank</b> TNGG160404R-FS	
		<b>R/L-F</b> 	<b>Finishing</b> Lead chipbreaker controls chip flow. The sharp edge produces a good surface finish.	Carbon Steel • Alloy Steel 	14° <b>Flank</b> TNGG160404R-F	
		M	<b>LP</b> 	<b>First recommendation for light cutting of carbon and alloy steels</b> Stable chip control in the light cutting range. The curved edge allows smooth chip discharge.	Carbon Steel • Alloy Steel 	15° 0.1 mm <b>Corner</b> 11° 0.2 mm <b>Flank</b> CNMG120408-LP
			<b>LM</b> 	<b>First recommendation for light cutting of stainless steel</b> Stable chip control at light cutting range. Breaker with high rake angle provides excellent burr control.	Stainless Steel 	15° 0.50 mm <b>Corner</b> 20° <b>Flank</b> CNMG120408-LM




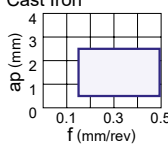

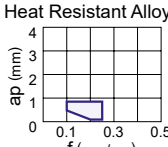

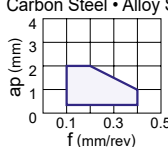

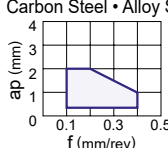

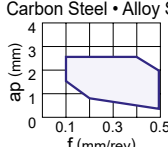

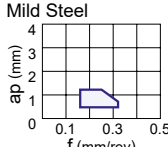

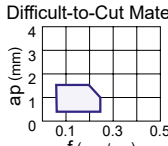

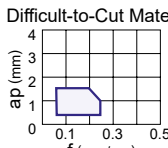

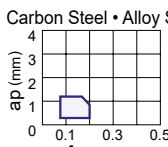
	Rhombic 80° 	Rhombic 55° 	Square 90° 	Triangular 60° 	Rhombic 35° 	Trigon 80° 	Round 	Breaker Name and Cross Section
	<b>CNMG_FP</b>  ↻ A098	<b>DNMG_FP</b>  ↻ A105	<b>SNMG_FP</b>  ↻ A113	<b>TNMG_FP</b>  ↻ A119	<b>VNMG_FP</b>  ↻ A126	<b>WNMG_FP</b>  ↻ A130		<b>FP</b> 
	<b>CNMG_FH</b>  ↻ A098	<b>DNMG_FH</b>  ↻ A105	<b>SNMG_FH</b>  ↻ A113	<b>TNMG_FH</b>  ↻ A119	<b>VNMG_FH</b>  ↻ A126	<b>WNMG_FH</b>  ↻ A130		<b>FH</b> 
	<b>CNMG_FS</b>  ↻ A098	<b>DNMG_FS</b>  ↻ A105	<b>SNMG_FS</b>  ↻ A113	<b>TNMG_FS</b>  ↻ A119	<b>VNMG_FS</b>  ↻ A126	<b>WNMG_FS</b>  ↻ A130		<b>FS</b> 
	<b>CNMG_FY</b>  ↻ A098	<b>DNMG_FY</b>  ↻ A105		<b>TNMG_FY</b>  ↻ A119		<b>WNMG_FY</b>  ↻ A130		<b>FY</b> 
	<b>CNGG_FJ</b>  ↻ A098	<b>DNGG_FJ</b>  ↻ A105			<b>VNGG_FJ</b>  ↻ A126			<b>FJ</b> 
				<b>TNGG_R/L-FS</b>  ↻ A119				<b>R/L-FS</b> 
				<b>TNGG_R/L-F</b>  ↻ A119	<b>VNGG_R/L-F</b>  ↻ A126			<b>R/L-F</b> 
	<b>CNMG_LP</b>  ↻ A098	<b>DNMG_LP</b>  ↻ A106	<b>SNMG_LP</b>  ↻ A113	<b>TNMG_LP</b>  ↻ A120	<b>VNMG_LP</b>  ↻ A126	<b>WNMG_LP</b>  ↻ A130		<b>LP</b> 
	<b>CNMG_LM</b>  ↻ A098	<b>DNMG_LM</b>  ↻ A106	<b>SNMG_LM</b>  ↻ A113	<b>TNMG_LM</b>  ↻ A120	<b>VNMG_LM</b>  ↻ A126	<b>WNMG_LM</b>  ↻ A130		<b>LM</b> 

# CLASSIFICATION

## NEGATIVE INSERTS WITH HOLE

TURNING INSERTS

A

Application	Tolerance	Breaker Name and Picture	Features		Cross Section Geometry
Light Cutting	M	<b>LK</b> 	<b>First recommendation for light cutting of cast iron</b> Positive land allows sharp cutting edge and low cutting resistance.	Cast Iron 	Flank 15° 0.15 mm 6° CNMG120408-LK
		<b>LS</b> 	<b>First recommendation for light cutting of difficult-to-cut materials.</b> <b>Alternative chipbreaker for light cutting of stainless steel</b> Enhanced chip disposal for depths of cut smaller than the corner R.	Heat Resistant Alloy 	20° 0.4 mm Corner 20° 0.6 mm Flank CNMG120408-LS
		<b>SH</b> 	<b>Alternative chipbreaker for light cutting of carbon and alloy steels</b> Can be used at low depth of cuts and high feed rates. The curved edge allows smooth chip discharge. Recommended for workpieces in the 160–250HB range.	Carbon Steel • Alloy Steel 	15° Corner 15° 0.2 mm Flank CNMG120408-SH
		<b>SA</b> 	<b>Alternative chipbreaker for light cutting of carbon and alloy steels</b> Superior chip control at small depth of cuts. Covers copying and back turning with wavy edge. Recommended for workpieces in the 200–300HB range.	Carbon Steel • Alloy Steel 	25° 0.3 mm Corner 10° 25° 0.34 mm Flank 8° CNMG120408-SA
		<b>SW</b> 	<b>Wiper insert for light cutting of carbon, alloy and stainless steels, and cast iron</b> In comparison to conventional chipbreakers, the surface finish is maintained even if the feed per revolution is doubled. Wiper design for increased productivity and improved surface finish.	Carbon Steel • Alloy Steel 	18° 0.15 mm Corner 7° 18° 0.15 mm Flank 7° CNMG120408-SW
		<b>SY</b> 	<b>First recommendation for light cutting of mild steel</b> Effectively controls adhesive chips. Suitable for mild steel light cutting.	Mild Steel 	10° Corner 10° 0.2 mm Flank CNMG120408-SY
		<b>MJ</b> 	<b>Alternative chipbreaker for light cutting of difficult-to-cut materials</b> Ideal for heat-resistant alloy and titanium alloy. The sharp edge produces a good surface finish. The curved edge allows smooth chip discharge. Excellent notch wear resistance for light to medium cutting.	Difficult-to-Cut Materials 	13° Corner 9° Flank CNMG120408-MJ
		<b>MJ</b> 	<b>Alternative chipbreaker for light cutting of difficult-to-cut materials</b> Double sided chipbreaker, single sided chipbreaker (D type, V type). The sharp edge produces a good surface finish. Ideal for heat-resistant and titanium alloy. The curved edge allows smooth chip discharge.	Difficult-to-Cut Materials 	13° Corner 9° Flank CNGG120408-MJ
		<b>R/L-K</b> 	<b>Light cutting</b> Parallel chipbreaker. Excellent chip control at low to medium feed rates.	Carbon Steel • Alloy Steel 	Flank 14° 0.25 mm TNGG160404R-K


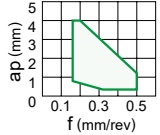
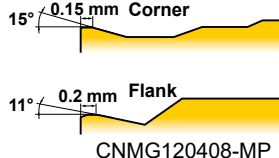


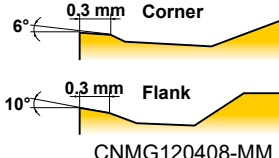

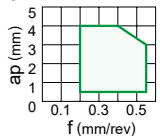
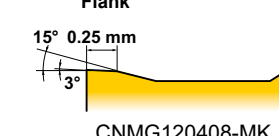


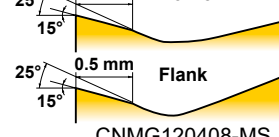

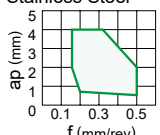
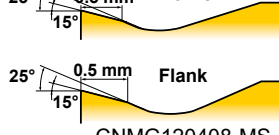


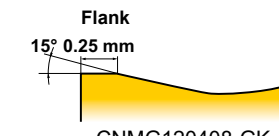

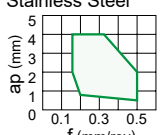
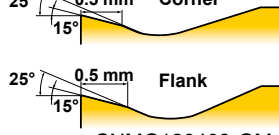

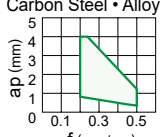
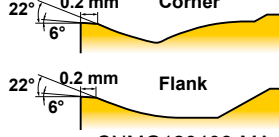

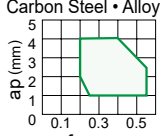
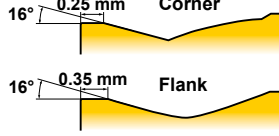
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	<b>CNMG_LS</b>  ↻ A099	<b>DNMG_LS</b>  ↻ A106		<b>TNMG_LS</b>  ↻ A120	<b>VNMG_LS</b>  ↻ A127	<b>WNMG_LS</b>  ↻ A131		<b>LS</b> 
	<b>CNMG_SH</b>  ↻ A099	<b>DNMG_SH</b>  ↻ A106	<b>SNMG_SH</b>  ↻ A113	<b>TNMG_SH</b>  ↻ A120	<b>VNMG_SH</b>  ↻ A127	<b>WNMG_SH</b>  ↻ A131		<b>SH</b> 
	<b>CNMG_SA</b>  ↻ A099	<b>DNMG_SA</b>  ↻ A107	<b>SNMG_SA</b>  ↻ A114	<b>TNMG_SA</b>  ↻ A120	<b>VNMG_SA</b>  ↻ A127	<b>WNMG_SA</b>  ↻ A131		<b>SA</b> 
	<b>CNMG_SW</b>  ↻ A099	<b>DNMX_SW</b>  ↻ A107		<b>TNMX_SW</b>  ↻ A120		<b>WNMG_SW</b>  ↻ A131		<b>SW</b> 
	<b>CNMG_SY</b>  ↻ A099	<b>DNMG_SY</b>  ↻ A107	<b>SNMG_SY</b>  ↻ A114	<b>TNMG_SY</b>  ↻ A121		<b>WNMG_SY</b>  ↻ A131		<b>SY</b> 
	<b>CNMG_MJ</b>  ↻ A099	<b>DNMG_MJ</b>  ↻ A107		<b>TNMG_MJ</b>  ↻ A121	<b>VNMG_MJ</b>  ↻ A127	<b>WNMG_MJ</b>  ↻ A131		<b>MJ(M)</b> 
	<b>CNGG_MJ</b>  ↻ A099	<b>DNGM_MJ</b>  ↻ A107			<b>VNGM_MJ</b>  ↻ A127			<b>MJ(G)</b> 
				<b>TNGG_R/L-K</b>  ↻ A121				<b>R/L-K</b> 


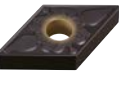


# CLASSIFICATION

## NEGATIVE INSERTS WITH HOLE

TURNING INSERTS

A

Application	Tolerance	Breaker Name and Picture	Features		Cross Section Geometry
Medium Cutting M		<p><b>MP</b></p> 	<p><b>First recommendation for medium cutting of carbon and alloy steels</b></p> <p>Suitable for medium to light cutting. Breaker geometry appropriate for copying and back turning. Cutting edge geometry for an optimum balance of sharpness and fracture resistance.</p>	Carbon Steel • Alloy Steel	  <p>15° 0.15 mm Corner 11° 0.2 mm Flank CNMG120408-MP</p>
		<p><b>MM</b></p> 	<p><b>First recommendation for medium cutting of stainless steel</b></p> <p>Optimized land geometry by simulation analysis technology controls the plastic deformation of the corner and achieves the long tool life.</p>	Stainless Steel	  <p>6° 0.3 mm Corner 10° 0.3 mm Flank CNMG120408-MM</p>
		<p><b>MK</b></p> 	<p><b>First recommendation for medium cutting of cast iron</b></p> <p>Optimum balance between sharpness and high edge strength for general use.</p>	Cast Iron	  <p>Flank 15° 0.25 mm 3° CNMG120408-MK</p>
		<p><b>MS</b></p> 	<p><b>First recommendation for medium cutting of stainless steel, and mild steels, and difficult-to-cut materials</b></p> <p>The large 2-step rake angle generates chips smoothly and without tangling during low feed cutting.</p>	Difficult-to-Cut Materials	  <p>25° 0.5 mm Corner 15° 25° 0.5 mm Flank 15° CNMG120408-MS</p>
		<p><b>MS</b></p> 	<p><b>Alternative chipbreaker for medium cutting of stainless and mild steels, and difficult-to-cut materials</b></p> <p>The sharp edge gives best performance. Flat top breaker shape offers high edge strength. Applicable to grades other than MP9005, MP9015, MP9025, MT9015</p>	Stainless Steel	  <p>25° 0.5 mm Corner 15° 25° 0.5 mm Flank 15° CNMG120408-MS</p>
		<p><b>GK</b></p> 	<p><b>Alternative chipbreaker for medium cutting of cast iron</b></p> <p>Versatile standard breaker. Flat land maintains a stable cutting edge.</p>	Cast Iron	  <p>Flank 15° 0.25 mm CNMG120408-GK</p>
		<p><b>GM</b></p> 	<p><b>Alternative chipbreaker for light to medium cutting of stainless steel</b></p> <p>Alternative chipbreaker of main chipbreaker LM and MM. Excellent notch wear resistance for light to medium cutting.</p>	Stainless Steel	  <p>25° 0.5 mm Corner 15° 25° 0.5 mm Flank 15° CNMG120408-GM</p>
		<p><b>MA</b></p> 	<p><b>Multi-assist breaker</b></p> <p>Ideal for general cutting applications. Positive land provides sharp cutting action</p>	Carbon Steel • Alloy Steel	  <p>22° 0.2 mm Corner 6° 22° 0.2 mm Flank 6° CNMG120408-MA</p>
		<p><b>MH</b></p> 	<p><b>Alternative chipbreaker for medium cutting of carbon and alloy steels</b></p> <p><b>First recommendation for rough cutting of mild steel</b></p> <p>Good chip control with suitable chip pocket</p>	Carbon Steel • Alloy Steel	  <p>16° 0.25 mm Corner 16° 0.35 mm Flank CNMG120408-MH</p>


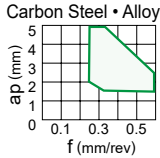

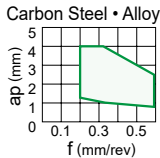

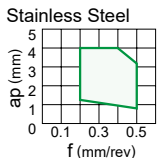

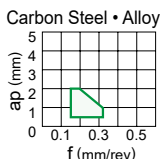

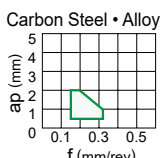

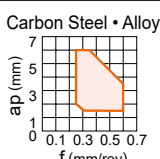

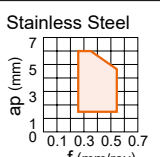

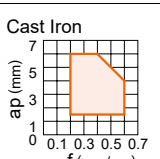

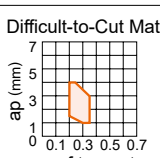
	Rhombic 80° 	Rhombic 55° 	Square 90° 	Triangular 60° 	Rhombic 35° 	Trigon 80° 	Round 	Breaker Name and Cross Section
	<b>CNMG_MP</b>  ↻ A100	<b>DNMG_MP</b>  ↻ A107	<b>SNMG_MP</b>  ↻ A114	<b>TNMG_MP</b>  ↻ A121	<b>VNMG_MP</b>  ↻ A127	<b>WNMG_MP</b>  ↻ A132		<b>MP</b> 
	<b>CNMG_MM</b>  ↻ A100	<b>DNMG_MM</b>  ↻ A107	<b>SNMG_MM</b>  ↻ A114	<b>TNMG_MM</b>  ↻ A121	<b>VNMG_MM</b>  ↻ A127	<b>WNMG_MM</b>  ↻ A132		<b>MM</b> 
	<b>CNMG_MK</b>  ↻ A100	<b>DNMG_MK</b>  ↻ A108	<b>SNMG_MK</b>  ↻ A114	<b>TNMG_MK</b>  ↻ A121	<b>VNMG_MK</b>  ↻ A127	<b>WNMG_MK</b>  ↻ A132		<b>MK</b> 
	<b>CNMG_MS</b>  ↻ A100	<b>DNMG_MS</b>  ↻ A108	<b>SNMG_MS</b>  ↻ A114	<b>TNMG_MS</b>  ↻ A121	<b>VNMG_MS</b>  ↻ A128	<b>WNMG_MS</b>  ↻ A132		<b>MS</b> 
	<b>CNMG_MS</b>  ↻ A101	<b>DNMG_MS</b>  ↻ A108	<b>SNMG_MS</b>  ↻ A115	<b>TNMG_MS</b>  ↻ A121	<b>VNMG_MS</b>  ↻ A128	<b>WNMG_MS</b>  ↻ A132		<b>MS</b> 
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	<b>CNMG_MA</b>  ↻ A101	<b>DNMG_MA</b>  ↻ A109	<b>SNMG_MA</b>  ↻ A115	<b>TNMG_MA</b>  ↻ A122	<b>VNMG_MA</b>  ↻ A128	<b>WNMG_MA</b>  ↻ A133		<b>MA</b> 
	<b>CNMG_MH</b>  ↻ A101	<b>DNMG_MH</b>  ↻ A109	<b>SNMG_MH</b>  ↻ A115	<b>TNMG_MH</b>  ↻ A122	<b>VNMG_MH</b>  ↻ A128	<b>WNMG_MH</b>  ↻ A133		<b>MH</b> 




# CLASSIFICATION

## NEGATIVE INSERTS WITH HOLE

TURNING INSERTS

A


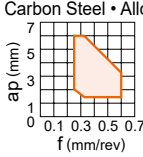

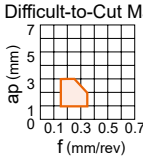

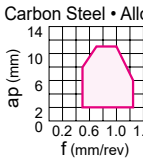

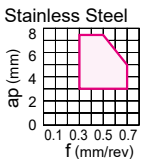

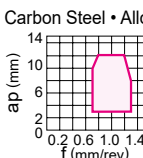

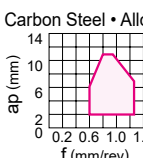

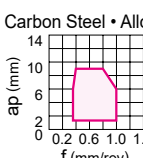

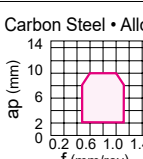

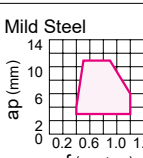
Application	Tolerance	Breaker Name and Picture	Features		Cross Section Geometry
Medium Cutting	M	<b>Standard</b> 	<b>Alternative chipbreaker for medium cutting of carbon and alloy steels</b> <b>First recommendation for medium cutting of cast iron</b> Flat land offers high edge strength. Flat top breaker shape offers high edge strength.	Carbon Steel • Alloy Steel 	15° 0.25 mm <b>Corner</b> 15° 0.25 mm <b>Flank</b> CNMG120408
		<b>MW</b> 	<b>Wiper insert for medium cutting carbon, alloy and, stainless steels, and cast iron</b> The wiper allows up to two times higher feed. A wide chip pocket prevents chip jamming.	Carbon Steel • Alloy Steel 	19° 0.25 mm <b>Corner</b> 19° 0.3 mm <b>Flank</b> CNMG120408-MW
		<b>R/L-ES</b> 	<b>Alternative chipbreaker for medium cutting of stainless steel</b> Good balance of edge strength and sharpness. Right- or left-hand breaker for unidirectional chip control.	Stainless Steel 	15° 0.16 mm <b>Flank</b> TNMG160404R-ES
		<b>R/L-2G</b> 	<b>Alternative chipbreaker for medium cutting of carbon and alloy steel</b> Parallel chipbreaker controls chip flow. Suitable for light to medium cutting.	Carbon Steel • Alloy Steel 	14° 0.2 mm <b>Flank</b> TNMG160404R-2G
		<b>R/L</b> 	<b>Medium cutting</b> Parallel chipbreaker. Good chip control for medium feed rates.	Carbon Steel • Alloy Steel 	14° 0.25 mm <b>Flank</b> TNGG160408R
Rough Cutting	M	<b>RP</b> 	<b>First recommendation for rough cutting of carbon and alloy steels</b> For interrupted cuts and removing scale. Good balance of cutting edge strength and low cutting resistance because of suitable rake angle.	Carbon Steel • Alloy Steel 	3° 0.33 mm <b>Corner</b> 0.33 mm <b>Flank</b> CNMG120408-RP
		<b>RM</b> 	<b>First recommendation for rough cutting of stainless steel</b> Excellent fracture resistance at interrupted cutting due to the optimum land angle and honing geometry.	Stainless Steel 	3° 0.32 mm <b>Corner</b> 6° 0.32 mm <b>Flank</b> CNMG120408-RM
		<b>RK</b> 	<b>First recommendation for rough cutting of cast iron</b> Extra wide land provides a stable cutting edge for interrupted machining and removal of scale.	Cast Iron 	15° 0.35 mm <b>Flank</b> CNMG120408-RK
		<b>RS</b> 	<b>First recommendation for rough cutting of difficult-to-cut materials</b> <b>Alternative chipbreaker for rough cutting of stainless steel</b> During low speed cutting the positive land controls chip welding and abrasion at the depth of cut line.	Difficult-to-Cut Materials 	20° 0.2 mm <b>Corner</b> 10° 0.2 mm <b>Flank</b> CNMG120408-RS

	Rhombic 80° 	Rhombic 55° 	Square 90° 	Triangular 60° 	Rhombic 35° 	Trigon 80° 	Round 	Breaker Name and Cross Section
	<b>CNMG</b>  ↻ A102	<b>DNMG</b>  ↻ A109	<b>SNMG</b>  ↻ A115	<b>TNMG</b>  ↻ A122	<b>VNMG</b>  ↻ A128	<b>WNMG</b>  ↻ A133	<b>RNMG</b>  ↻ A112	<b>Standard</b> 
	<b>CNMG_MW</b>  ↻ A102	<b>DNMX_MW</b>  ↻ A109		<b>TNMX_MW</b>  ↻ A123		<b>WNMG_MW</b>  ↻ A133		<b>MW</b> 
				<b>TNMG_R/L-ES</b>  ↻ A123				<b>R/L-ES</b> 
				<b>TNMG_R/L-2G</b>  ↻ A123				<b>R/L-2G</b> 
		<b>DNGG_R/L</b>  ↻ A109	<b>SNGG_R/L</b>  ↻ A116	<b>TNGG_R/L</b>  ↻ A123	<b>VNGG_R/L</b>  ↻ A129			<b>R/L</b> 
	<b>CNMG_RP</b>  ↻ A102	<b>DNMG_RP</b>  ↻ A109	<b>SNMG_RP</b>  ↻ A116	<b>TNMG_RP</b>  ↻ A123		<b>WNMG_RP</b>  ↻ A133		<b>RP</b> 
	<b>CNMG_RM</b>  ↻ A102	<b>DNMG_RM</b>  ↻ A110	<b>SNMG_RM</b>  ↻ A116	<b>TNMG_RM</b>  ↻ A123		<b>WNMG_RM</b>  ↻ A133		<b>RM</b> 
	<b>CNMG_RK</b>  ↻ A103	<b>DNMG_RK</b>  ↻ A110	<b>SNMG_RK</b>  ↻ A116	<b>TNMG_RK</b>  ↻ A124		<b>WNMG_RK</b>  ↻ A134		<b>RK</b> 
	<b>CNMG_RS</b>  ↻ A103	<b>DNMG_RS</b>  ↻ A110	<b>SNMG_RS</b>  ↻ A116	<b>TNMG_RS</b>  ↻ A124		<b>WNMG_RS</b>  ↻ A134		<b>RS</b> 







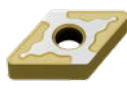





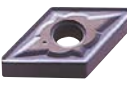






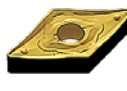








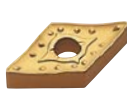








# CLASSIFICATION

## NEGATIVE INSERTS WITH HOLE

TURNING INSERTS

Application	Tolerance	Breaker Name and Picture	Features		Cross Section Geometry
Rough Cutting	M	<b>GH</b> 	<b>Alternative chipbreaker for rough cutting of carbon and alloy steels, and cast iron</b> For interrupted cuts and removing scale. A combination of wide land and a large chip pocket allows high feed rates.	Carbon Steel • Alloy Steel 	18° 0.32 mm Corner 18° 0.32 mm Flank CNMG120408-GH
		<b>GJ</b> 	<b>Alternative chipbreaker for rough cutting of difficult-to-cut materials</b> Excellent balance of edge sharpness and strength. Edge geometry with high face wear resistance.	Difficult-to-Cut Materials 	18° 0.15 mm Corner 18° 0.15 mm Flank CNMG120408-GJ
Heavy Cutting	M	<b>HX</b> 	<b>First recommendation for heavy cutting of carbon and alloy steels</b> Covers the medium range of the heavy cutting region. Owing to the straight edge and chamfer, it gives a balance of sharpness and strength. Variable land and a wavy chipbreaker for good chip control.	Carbon Steel • Alloy Steel 	23° 0.43 mm Corner 21° 0.52 mm Flank CNMM190616-HX
		<b>HL</b> 	<b>First recommendation for heavy cutting of stainless steel</b> <b>Alternative chipbreaker for heavy cutting of carbon and alloy steels</b> Covers the lower end of the heavy cutting region. The curved edge and narrow chamfer allow good chip control and sharp cutting action. Dots on the nose radius ensure chip control at low depths of cut.	Stainless Steel 	15° 0.34 mm CNMM190616-HL
		<b>HR</b> 	<b>Alternative chipbreaker for heavy cutting of carbon and alloy steels</b> Covers the heavy cutting region by using a straight cutting edge with high edge strength. It exhibits smooth chip control during large depths of cut and high feed rate machining.	Carbon Steel • Alloy Steel 	20° 0.58 mm CNMM250924-HR
		<b>HV</b> 	<b>Alternative chipbreaker for heavy cutting of carbon and alloy steels</b> Covers the upper end of the heavy cutting region. Wide land and large chamfer offer high edge strength. A wide chipbreaker prevents chip jamming.	Carbon Steel • Alloy Steel 	20° 0.68 mm Corner 20° 0.68 mm Flank SNMM190616-HV
		<b>HZ</b> 	<b>Alternative chipbreaker for heavy cutting of carbon and alloy steels</b> Covers the lower end of the heavy cutting region. Low cutting resistance due to positive land and curved edge. Teardrop dots improve chip control without increasing cutting resistance.	Carbon Steel • Alloy Steel 	22° 0.42 mm Corner 6° 22° 0.42 mm Flank 6° CNMM190616-HZ
		<b>HM</b> 	<b>Alternative chipbreaker for heavy cutting of carbon, alloy and stainless steels</b> Covers the lower end through to the medium range of the heavy cutting region. The curved edge and narrow chamfer allow good chip control and sharp cutting action. Teardrop dots provided along the cutting edge ensures chip control even with variable depths of cut.	Carbon Steel • Alloy Steel 	16° 0.32 mm CNMM190616-HM
		<b>HXD</b> 	<b>Alternative chipbreaker for heavy cutting of mild and stainless steels</b> Covers the lower end through to the medium range of the heavy cutting region. Balance of sharpness and strength owing to a narrow chamfer and variable land.	Mild Steel 	25° 0.35 mm Corner 30° 0.55 mm Flank SNMM250724




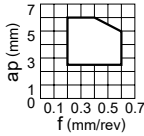

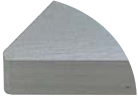
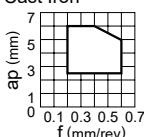

	Rhombic 80° 	Rhombic 55° 	Square 90° 	Triangular 60° 	Rhombic 35° 	Trigon 80° 	Round 	Breaker Name and Cross Section
	<b>CNMG_GH</b>  ↻ A103	<b>DNMG_GH</b>  ↻ A110	<b>SNMG_GH</b>  ↻ A117	<b>TNMG_GH</b>  ↻ A124		<b>WNMG_GH</b>  ↻ A134		<b>GH</b> 
	<b>CNMG_GJ</b>  ↻ A103	<b>DNMG_GJ</b>  ↻ A110				<b>WNMG_GJ</b>  ↻ A134		<b>GJ</b> 
	<b>CNMM_HX</b>  ↻ A103		<b>SNMM_HX</b>  ↻ A117					<b>HX</b> 
	<b>CNMM_HL</b>  ↻ A103	<b>DNMM_HL</b>  ↻ A110	<b>SNMM_HL</b>  ↻ A117	<b>TNMM_HL</b>  ↻ A124				<b>HL</b> 
	<b>CNMM_HR</b>  ↻ A104		<b>SNMM_HR</b>  ↻ A117					<b>HR</b> 
	<b>CNMM_HV</b>  ↻ A104		<b>SNMM_HV</b>  ↻ A117					<b>HV</b> 
	<b>CNMM_HZ</b>  ↻ A104	<b>DNMM_HZ</b>  ↻ A111	<b>SNMM_HZ</b>  ↻ A117	<b>TNMM_HZ</b>  ↻ A124				<b>HZ</b> 
	<b>CNMM_HM</b>  ↻ A104		<b>SNMM_HM</b>  ↻ A117					<b>HM</b> 
			<b>SNMM_HXD</b>  ↻ A118					<b>HXD</b> 









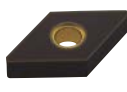


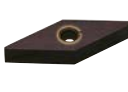







# CLASSIFICATION

## NEGATIVE INSERTS WITH HOLE

**A**

TURNING INSERTS

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
For Cast Iron	M	<p><b>Flat Top</b></p> 	<p><b>First recommendation for heavy cutting of cast iron</b> Most effective for unstable machining due to its high edge strength.</p>	<p>Cast Iron</p>  <p>0°</p>  <p>CNMA120408</p>
	G	<p><b>Flat Top</b></p> 	<p><b>For heavy cutting of cast iron</b> Most effective for unstable machining due to its high edge strength. Can be used on workpieces requiring close tolerances due to G class insert tolerance.</p>	<p>Cast Iron</p>  <p>0°</p>  <p>DNGA150408</p>

	Rhombic 80° 	Rhombic 55° 	Square 90° 	Triangular 60° 	Rhombic 35° 	Trigon 80° 	Round 	Breaker Name and Cross Section
	<b>CNMA</b>  ↻ A104	<b>DNMA</b>  ↻ A111	<b>SNMA</b>  ↻ A118	<b>TNMA</b>  ↻ A125	<b>VNMA</b>  ↻ A129	<b>WNMA</b>  ↻ A134		<b>Flat Top(M)</b> 
		<b>DNGA</b>  ↻ A111	<b>SNGA</b>  ↻ A118	<b>TNGA</b>  ↻ A125	<b>VNGA</b>  ↻ A129			<b>Flat Top(G)</b> 

**A**


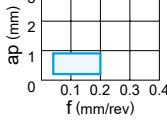
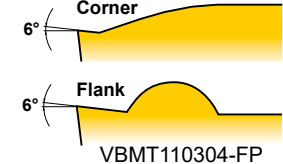

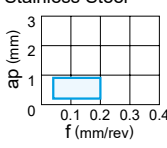
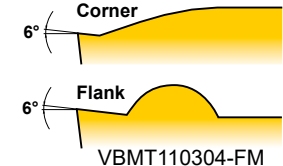

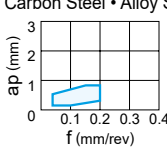
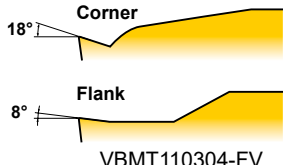

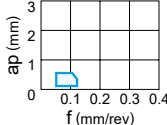
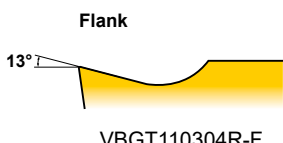

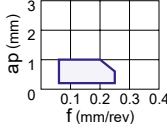

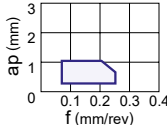
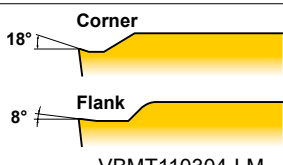

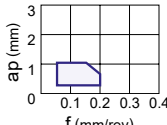
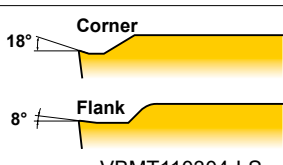

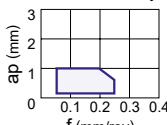
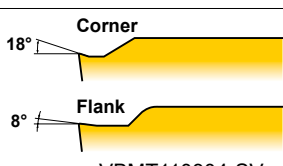

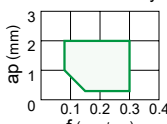
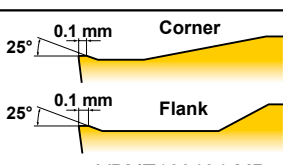
TURNING INSERTS























# CLASSIFICATION

## 5° POSITIVE INSERTS WITH HOLE

TURNING INSERTS

A

Application	Tolerance	Breaker Name and Picture	Features		Cross Section Geometry
Finish Cutting	M	<b>FP</b> 	<b>First recommendation for finish cutting of carbon, alloy and mild steels</b> Breaker protrusion at the corner tip controls chips even at small depth of cut. Maintains the edge strength at the corner and prevents sudden fractures.	Carbon Steel • Alloy Steel 	 Corner 6° Flank 6° VBMT110304-FP
		<b>FM</b> 	<b>First recommendation for finish cutting of stainless steel</b> Breaker protrusion at the corner tip controls chips even at small depth of cut. Maintains the edge strength at the corner and prevents sudden fractures.	Stainless Steel 	 Corner 6° Flank 6° VBMT110304-FM
		<b>FV</b> 	<b>First recommendation for finish cutting of carbon, alloy, mild and stainless steels</b> Suitable for low depths of cut and low feed rates. Sharp cutting edge and low resistance design achieves excellent cutting performance.	Carbon Steel • Alloy Steel 	 Corner 18° Flank 8° VBMT110304-FV
	G	<b>R/L-F</b> 	<b>Finishing</b> Lead chipbreaker controls chip flow. Sharp cutting edge gives a good surface finish.	Carbon Steel • Alloy Steel 	 Flank 13° VBGT110304R-F
	Light Cutting	M	<b>LP</b> 	<b>First recommendation for light cutting of carbon steel and alloy steel</b> Sharp cutting edge due to a large rake angle. Prevents welding of the insert and controls white turbidity of the surface finish. Breaker protrusion suitable for depth of cut area achieves a wide range of chip control.	Carbon Steel • Alloy Steel 
<b>LM</b> 			<b>First recommendation for light cutting of stainless steel</b> Sharp cutting edge due to a large rake angle. Prevents welding of the insert and controls white turbidity of the surface finish. Breaker protrusion suitable for depth of cut area achieves a wide range of chip control.	Stainless Steel 	 Corner 18° Flank 8° VBMT110304-LM
<b>NEW LS</b> 			<b>First recommendation for light cutting of difficult-to-cut materials</b> Prevents welding of the insert and controls white turbidity of the surface finish.	Difficult-to-Cut Materials 	 Corner 18° Flank 8° VBMT110304-LS
<b>SV</b> 			<b>Alternative chipbreaker for carbon steel, alloy steel and stainless steel</b> Large rake angle provides sharp cutting action. A peninsular dot ensures chip control at depths of cut under 1mm.	Carbon Steel • Alloy Steel 	 Corner 18° Flank 8° VBMT110304-SV
Medium Cutting	M	<b>MP</b> 	<b>First recommendation for medium cutting of carbon steel, alloy steel and mild steel</b> Good balance of wear resistance and fracture resistance because of the flat land cutting edge. A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depth of cut.	Carbon Steel • Alloy Steel 	 Corner 25° 0.1 mm Flank 25° 0.1 mm VBMT160404-MP

	Rhombic 80° 	Rhombic 55° 	Square 90° 	Triangular 60° 	Rhombic 35° 	Trigon 80° 	Round 	Breaker Name and Cross Section
					VBMT_FP  ⊕ A164			FP 
					VBMT_FM  ⊕ A164			FM 
					VBMT_FV  ⊕ A164			FV 
					VBGT_R/L-F  ⊕ A164	WBG_T_R/L-F  ⊕ A172		R/L-F 
					VBMT_LP  ⊕ A164			LP 
					VBMT_LM  ⊕ A164			LM 
					NEW VBMT_LS  ⊕ A165			NEW LS 
					VBMT_SV  ⊕ A165			SV 
					VBMT_MP  ⊕ A165			MP 


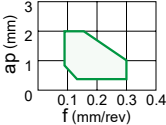
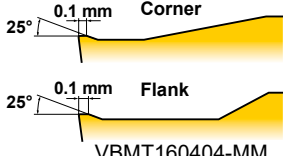

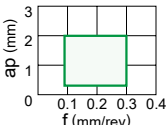
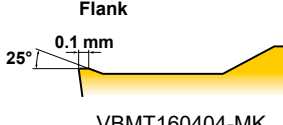
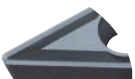
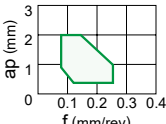
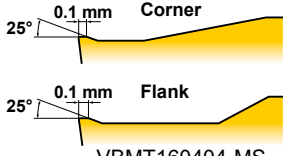

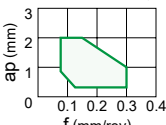
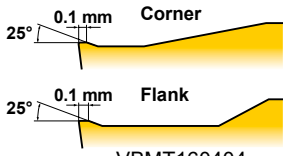

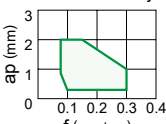
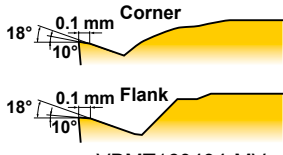

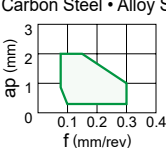
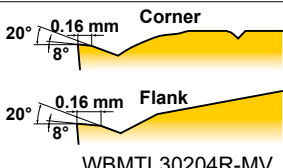

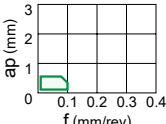
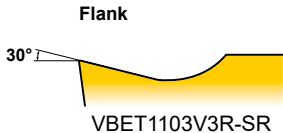

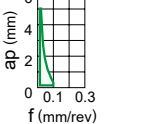
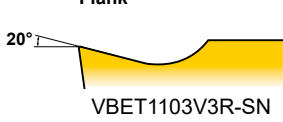
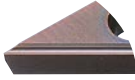
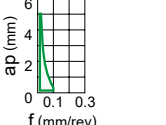
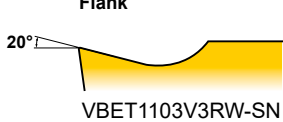

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


TURNING INSERTS

# CLASSIFICATION

## 5° POSITIVE INSERTS WITH HOLE

TURNING INSERTS

Application	Tolerance	Breaker Name and Picture	Features		Cross Section Geometry
Medium Cutting	M	<b>MM</b> 	<b>First recommendation for medium cutting of stainless steel</b> Good balance of wear resistance and fracture resistance because of the flat land cutting edge. A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depth of cut.	Stainless Steel 	 VBMT160404-MM
		<b>MK</b> 	<b>First recommendation for medium cutting of cast iron</b> Optimum balance between sharpness and high edge strength for general use.	Cast Iron 	 VBMT160404-MK
		<b>MS</b> 	<b>First recommendation for medium cutting of difficult-to-cut materials</b> Ideal for heat-resistant alloy and titanium alloy and cobalt chrome alloy. A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depth of cut.	Difficult-to-Cut Materials 	 VBMT160404-MS
		<b>Standard</b> 	<b>Alternative chipbreaker for medium cutting of carbon, alloy and stainless steels</b> Balance of edge strength and sharpness due to a combination of a flat land and large rake angle.	Carbon Steel • Alloy Steel 	 VBMT160404
		<b>MV</b> 	<b>Alternative chipbreaker for medium cutting of carbon, alloy, mild and stainless steels</b> A positive insert with a large rake angle achieves sharp cutting edge performance. The double breakers and round-shaped dots in the rake face achieve a wide range of chip discharge.	Carbon Steel • Alloy Steel 	 VBMT160404-MV
		<b>R/L-MV</b> 	<b>Alternative chipbreaker for medium cutting of carbon, alloy, mild and stainless steels</b> A positive insert with a large rake angle achieves sharp cutting edge performance. The double breakers and round-shaped dots in the rake face achieve a wide range of chip discharge.	Carbon Steel • Alloy Steel 	 WBMTL30204R-MV
		<b>R/L-SR</b> 	<b>Medium cutting on automatic lathes</b> A wide lead chipbreaker. Insert designed for low resistance chip control.	Carbon Steel • Alloy Steel 	 VBET1103V3R-SR
		<b>R/L-SN</b> 	<b>Medium cutting on automatic lathes</b> A parallel chipbreaker. Excellent chip control for low to medium feed rates.	Carbon Steel • Alloy Steel 	 VBET1103V3R-SN
		<b>R/LW-SN</b> 	<b>Medium cutting on automatic lathes</b> A parallel chipbreaker. Excellent chip control for low to medium feed rates. The wiper produces good cutting surface.	Carbon Steel • Alloy Steel 	 VBET1103V3RW-SN
		For Cast Iron	M	<b>Flat Top</b> 	<b>Rough cutting of cast iron</b> Flat top. Most effective for unstable machining due to its high edge strength.

	Rhombic 80° 	Rhombic 55° 	Square 90° 	Triangular 60° 	Rhombic 35° 	Trigon 80° 	Round 	Breaker Name and Cross Section
					VBMT_MM  ⊕ A165			MM 
					VBMT_MK  ⊕ A165			MK 
					VBMT_MS  ⊕ A165			MS 
					VBMT  ⊕ A165			Standard 
					VBMT_MV  ⊕ A165			MV 
						WBMT_R/L-MV  ⊕ A172		R/L-MV 
					VBET_R/L-SR  ⊕ A166			R/L-SR 
					VBET_R/L-SN  ⊕ A166			R/L-SN 
					VBET_R/LW-SN  ⊕ A166			R/LW-SN 
					VBMW  ⊕ A166			Flat Top 

A


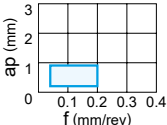
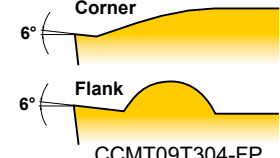
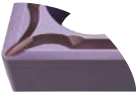
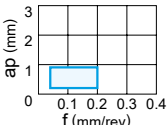
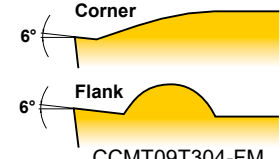
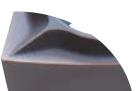
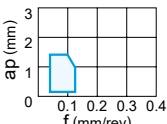
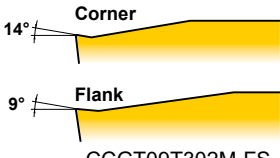

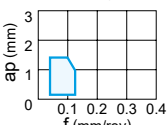
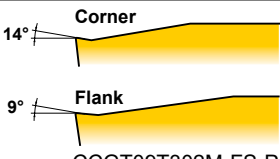

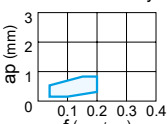
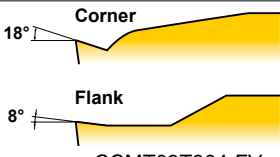

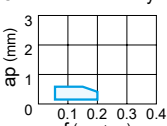
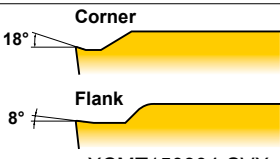
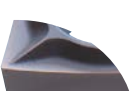
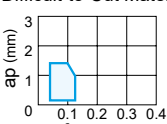
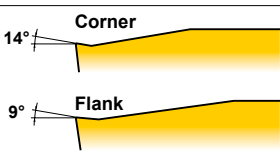

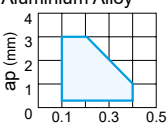
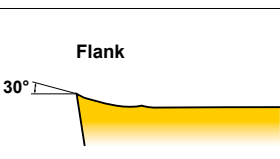
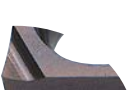
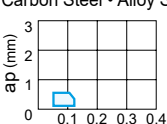
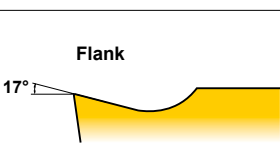
TURNING INSERTS

# CLASSIFICATION


## 7° POSITIVE INSERTS WITH HOLE

TURNING INSERTS

A

Application	Tolerance	Breaker Name and Picture	Features		Cross Section Geometry
M		<b>FP</b> 	<b>First recommendation for finish cutting of carbon steel, alloy and mild steels</b> Breaker protrusion at the corner tip controls chips even at small depth of cut. Maintains the edge strength at the corner and prevents sudden fractures.	Carbon Steel • Alloy Steel 	 CCMT09T304-FP
		<b>FM</b> 	<b>First recommendation for finish cutting of stainless steel</b> Breaker protrusion at the corner tip controls chips even at small depth of cut. Maintains the edge strength at the corner and prevents sudden fractures.	Stainless Steel 	 CCMT09T304-FM
G		<b>FS</b> 	<b>First recommendation for finish cutting of difficult-to-cut materials</b> Ideal for heat-resistant alloys, titanium alloys, and cobalt chrome alloys. Sharp cutting edges provide excellent surface precision. Highly efficient chip discharge is possible due to curved cutting edges.	Difficult-to-Cut Materials 	 CCGT09T302M-FS
		<b>FS-P</b> 	<b>First recommendation for finish cutting of titanium alloys</b> Ideal for titanium alloys and copper alloys. Sharp cutting edges provide excellent surface precision. Highly efficient chip discharge is possible due to curved cutting edges. Polished (mirror-surface) finish of insert surfaces drastically improves welding resistance extending tool life.	Titanium Alloy 	 CCGT09T302M-FS-P
M	Finish Cutting	<b>FV</b> 	<b>Alternative chipbreaker for finish cutting of carbon, alloy, mild and stainless steels</b> Suitable for low depths of cut and low feed rates. Sharp cutting edge and low resistance design achieves excellent cutting performance.	Carbon Steel • Alloy Steel 	 CCMT09T304-FV
		<b>SVX</b> 	<b>Alternative chipbreaker for light cutting of carbon and alloy steels</b> Chip control is improved by having a chipbreaker geometry suitable for copying.	Carbon Steel • Alloy Steel 	 XCMT150304-SVX
G		<b>FJ</b> 	<b>Alternative chipbreaker for light cutting of carbon and alloy steels</b> Ideal for heat-resistant alloy and titanium alloy. The sharp edge produces a good surface finish. The curved edge allows smooth chip discharge.	Difficult-to-Cut Materials 	 CCGT09T302-FJ
		<b>AZ</b> 	<b>For aluminium alloy</b> The high rake angle and 3D curved cutting edge provides sharpness at the cutting point. Additionally the 3D shape of the rake face enables excellent chip control. Lapping of the top surface gives a mirror finish for improved welding resistance.	Aluminium Alloy 	 DCGT11T304-AZ
		<b>R/L-F</b> 	<b>Finishing</b> Lead chipbreaker controls chip flow. Sharp cutting edge gives a good surface finish.	Carbon Steel • Alloy Steel 	 CCGT03S102L-F




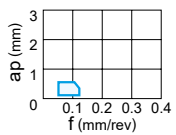
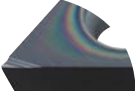
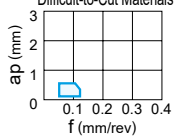

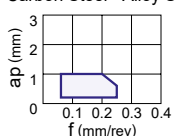

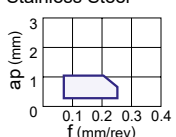

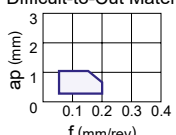
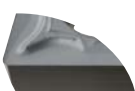
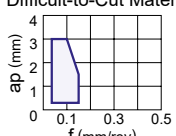

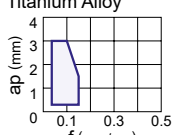

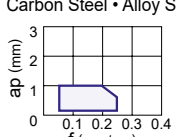

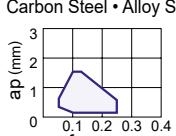
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	CCMT_FM  ↻ A139	DCMT_FM  ↻ A147	SCMT_FM  ↻ A155	TCMT_FM  ↻ A158	VCMT_FM  ↻ A167				FM 
	CCGT_FS  ↻ A139	DCGT_FS  ↻ A147							FS 
	CCGT_FS-P  ↻ A139	DCGT_FS-P  ↻ A147							FS-P 
	CCMT_FV  ↻ A139	DCMT_FV  ↻ A147	SCMT_FV  ↻ A155	TCMT_FV  ↻ A158	VCMT_FV  ↻ A167				FV 
								XCMT_SVX  ↻ A175	SVX 
	CCGT_FJ  ↻ A139								FJ 
	CCGT_AZ  ↻ A140	DCGT_AZ  ↻ A147		TCGT_AZ  ↻ A158	VCGT_AZ  ↻ A167			RCGT_AZ  ↻ A154	AZ 
	CCGT_L-F CCGH_R/L-F  ↻ A140	DCGT_R/L-F  ↻ A148		TCGT_R/L-F  ↻ A158	VCGT_R/L-F  ↻ A167				R/L-F 











































# CLASSIFICATION

## 7° POSITIVE INSERTS WITH HOLE

TURNING INSERTS

A

Application	Tolerance	Breaker Name and Picture	Features		Cross Section Geometry
Finish Cutting	G	<b>R/L</b> 	<b>Finishing</b> Lead chipbreaker. Excellent chip control at low feed rates.	Carbon Steel • Alloy Steel 	Flank 15° WCGT020104R
		<b>NEW R-SRF</b> 	<b>Finishing</b> Lead chipbreaker controls chip flow. Sharp cutting edge gives a good surface finish.	Carbon Steel • Alloy Steel • Stainless Steel • Difficult-to-Cut Materials 	Flank 15° DCGT11T301MR-SRF
Light Cutting	M	<b>LP</b> 	<b>First recommendation for light cutting of carbon, alloy and mild steels</b> Sharp cutting edge due to a large rake angle. Prevents welding of the insert and controls white turbidity of the surface finish. Breaker protrusion suitable for depth of cut area achieves a wide range of chip control.	Carbon Steel • Alloy Steel 	Corner 18° Flank 8° CCMT09T308-LP
		<b>LM</b> 	<b>First recommendation for light cutting of stainless steel</b> Sharp cutting edge due to a large rake angle. Prevents welding of the insert and controls white turbidity of the surface finish. Breaker protrusion suitable for depth of cut area achieves a wide range of chip control.	Stainless Steel 	Corner 18° Flank 8° CCMT09T308-LM
		<b>LS</b> 	<b>First recommendation for light cutting of difficult-to-cut materials</b> Prevents welding of the insert and controls cloudy surface of the surface finish.	Difficult-to-Cut Materials 	Corner 18° Flank 8° CCMT09T308-LS
Light Cutting	G	<b>LS</b> 	<b>First recommendation for light cutting of difficult-to-cut materials</b> Ideal for heat resistant alloys, titanium alloys, and cobalt chromium alloys. Designed with parallel cutting edges. Achieves stable chip control over a wide range from low to medium depths of cut.	Difficult-to-Cut Materials 	Corner 12° Flank 6° CCGT09T304M-LS
		<b>LS-P</b> 	<b>First recommendation for light cutting of titanium alloys</b> Ideal for titanium alloys and copper alloys. Designed with parallel cutting edges. Achieves stable chip control over a wide range from low to medium depths of cut. Polished (mirror-surface) finish of insert surfaces drastically improves welding resistance extending tool life.	Titanium Alloy 	Corner 12° Flank 6° CCGT09T304M-LS-P
Light Cutting	M	<b>SV</b> 	<b>Alternative chipbreaker for light cutting of carbon steel, alloy, mild and stainless steels</b> Large rake angle provides sharp cutting action. A peninsular dot ensures chip control at depths of cut under 1mm.	Carbon Steel • Alloy Steel 	Corner 18° Flank 8° CCMH060204-SV
		<b>SW</b> 	<b>Wiper insert for light cutting of carbon, alloy, mild and stainless steels</b> The wiper allows up to double the feed rate. Positive land improves sharpness.	Carbon Steel • Alloy Steel 	Corner 20° 0.12 mm 12° Flank 16° 0.12 mm 8° CCMT09T304-SW


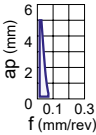
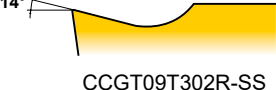

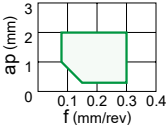
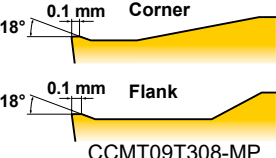

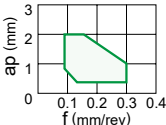
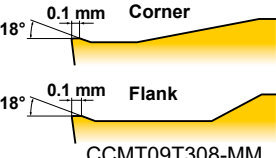

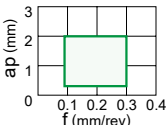
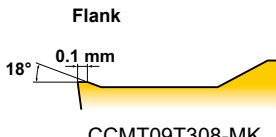

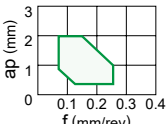
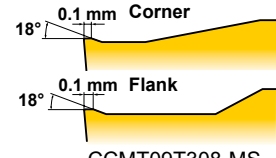

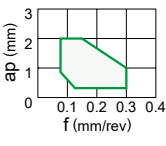
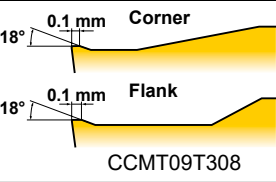
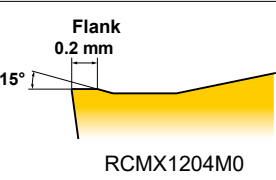

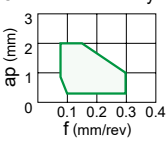
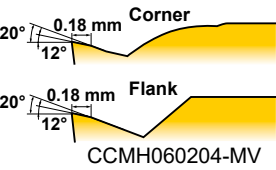

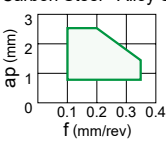
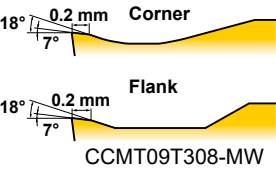
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						WCGT_R/L  ↻ A173		R/L 
		DCGT_R-SRF <small>NEW</small>  ↻ A148						<small>NEW</small> R-SRF 
	CCMT_LP  ↻ A141	DCMT_LP  ↻ A148	SCMT_LP  ↻ A155	TCMT_LP  ↻ A159	VCMT_LP  ↻ A167			LP 
	CCMT_LM  ↻ A141	DCMT_LM  ↻ A148	SCMT_LM  ↻ A155	TCMT_LM  ↻ A159	VCMT_LM  ↻ A167			LM 
	CCMT_LS  ↻ A141	DCMT_LS  ↻ A148		TCMT_LS <small>NEW</small>  ↻ A159	VCMT_LS  ↻ A168			LS(M) 
	CCGT_LS  ↻ A141	DCGT_LS  ↻ A148			VCGT_LS  ↻ A168			LS(G) 
	CCGT_LS-P  ↻ A141	DCGT_LS-P  ↻ A149			VCGT_LS-P  ↻ A168			LS-P 
	CCMH_SV  ↻ A141	DCMT_SV  ↻ A149			VCMT_SV  ↻ A168			SV 
	CCMT_SW  ↻ A141							SW 





# CLASSIFICATION

## 7° POSITIVE INSERTS WITH HOLE

TURNING INSERTS

A

Application	Tolerance	Breaker Name and Picture	Features		Cross Section Geometry
Light Cutting	G	<b>R/L-SS</b> 	<b>Chipbreaker for light cutting on automatic lathes</b> A parallel chipbreaker. Excellent chip control at low feed rates.	Carbon Steel • Alloy Steel 	Flank 14°  CCGT09T302R-SS
		<b>MP</b> 	<b>First recommendation for medium cutting of carbon, alloy and mild steels</b> Good balance of wear resistance and fracture resistance because of the flat land cutting edge. A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depth of cut.	Carbon Steel • Alloy Steel 	0.1 mm Corner 18° 0.1 mm Flank 18°  CCMT09T308-MP
Medium Cutting	M	<b>MM</b> 	<b>First recommendation for medium cutting of stainless steel</b> Good balance of wear resistance and fracture resistance because of the flat land cutting edge. A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depth of cut.	Stainless Steel 	0.1 mm Corner 18° 0.1 mm Flank 18°  CCMT09T308-MM
		<b>MK</b> 	<b>First recommendation for medium cutting of cast iron</b> Optimum balance between sharpness and high edge strength for general use.	Cast Iron 	Flank 0.1 mm 18°  CCMT09T308-MK
		<b>MS</b> 	<b>First recommendation for medium cutting of difficult-to-cut materials</b> Ideal for heat-resistant alloy and titanium alloy and cobalt chrome alloy. A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depth of cut.	Difficult-to-Cut Materials 	0.1 mm Corner 18° 0.1 mm Flank 18°  CCMT09T308-MS
		<b>Standard</b> 	<b>Alternative chipbreaker for medium cutting of carbon, alloy, mild and stainless steels, and cast iron</b> Balance of edge strength and sharpness due to a combination of a flat land and large rake angle.	Carbon Steel • Alloy Steel 	0.1 mm Corner 18° 0.1 mm Flank 18°  CCMT09T308 Flank 0.2 mm 15°  RCMX1204M0
		<b>MV</b> 	<b>Alternative chipbreaker for medium cutting of carbon, alloy, mild and stainless steels</b> A positive insert and the large rake angle achieve sharp cutting edge performance. The double breakers and round shape in the rake face achieve a wide range of chip discharge.	Carbon Steel • Alloy Steel 	0.18 mm Corner 20° 12° 0.18 mm Flank 20° 12°  CCMH060204-MV
		<b>MW</b> 	<b>Wiper insert for medium cutting of carbon, alloy, mild and stainless steels</b> The wiper allows up to double the feed rate. A wide chip pocket prevents chip jamming.	Carbon Steel • Alloy Steel 	0.2 mm Corner 18° 7° 0.2 mm Flank 18° 7°  CCMT09T308-MW


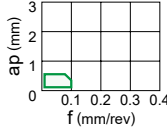


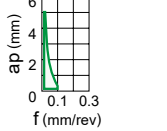
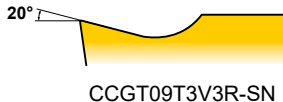
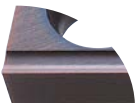
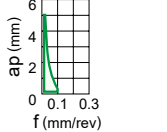
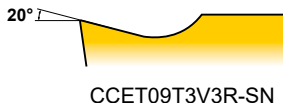
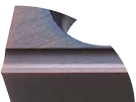
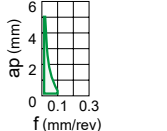
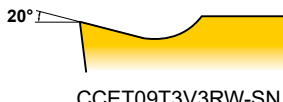

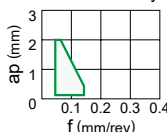


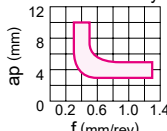
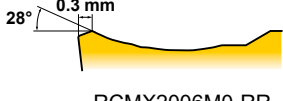

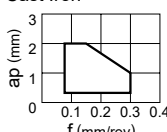
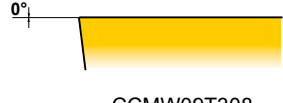

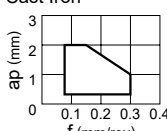

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	CCMT_MP  ↻ A142	DCMT_MP  ↻ A149	SCMT_MP  ↻ A155	TCMT_MP  ↻ A159	VCMT_MP  ↻ A168			MP 
	CCMT_MM  ↻ A142	DCMT_MM  ↻ A149	SCMT_MM  ↻ A155	TCMT_MM  ↻ A159	VCMT_MM  ↻ A168			MM 
	CCMT_MK  ↻ A143	DCMT_MK  ↻ A150	SCMT_MK  ↻ A156	TCMT_MK  ↻ A159	VCMT_MK  ↻ A169			MK 
	CCMT_MS  ↻ A143	DCMT_MS  ↻ A150	<small>NEW</small> SCMT_MS  ↻ A156	<small>NEW</small> TCMT_MS  ↻ A159	VCMT_MS  ↻ A169			MS 
	CCMT  ↻ A143	DCMT  ↻ A150	SCMT  ↻ A156	TCMT  ↻ A160	VCMT  ↻ A169	WCMT  ↻ A173	RCMT  ↻ A154	Standard 
							RCMX  ↻ A154	
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	CCMT_MW  ↻ A143							MW 


































# CLASSIFICATION

## 7° POSITIVE INSERTS WITH HOLE

TURNING INSERTS

A

Application	Tolerance	Breaker Name and Picture	Features		Cross Section Geometry
Medium Cutting	E	<b>R/L-SR</b> 	<b>Medium cutting on automatic lathes</b> A wide lead chipbreaker. Insert designed for low resistance chip control.	Carbon Steel • Alloy Steel 	<b>Flank</b> 30°  CCET09T3V3R-SR
	G	<b>R/L-SN</b> 	<b>Medium cutting on automatic lathes</b> A parallel chipbreaker. Excellent chip control at low to medium feed rates.	Carbon Steel • Alloy Steel 	<b>Flank</b> 20°  CCGT09T3V3R-SN
	E	<b>R/L-SN</b> 	<b>Medium cutting on automatic lathes</b> A parallel chipbreaker. Excellent chip control at low to medium feed rates. Suitable for precise machining with E class tolerance.	Carbon Steel • Alloy Steel 	<b>Flank</b> 20°  CCET09T3V3R-SN
	E	<b>R/LW-SN</b> 	<b>Medium cutting on automatic lathes</b> A parallel chipbreaker. Excellent chip control at low to medium feed rates. The wiper produces a good surface finish.	Carbon Steel • Alloy Steel 	<b>Flank</b> 20°  CCET09T3V3RW-SN
	G	<b>SMG</b> 	<b>Medium cutting on automatic lathes</b> 3D moulded chipbreaker provides good chip control. G class insert gives sharp cutting action, allowing high precision machining. Breaker geometry appropriate for copying and back turning.	Carbon Steel • Alloy Steel 	<b>Corner</b> 14° <b>Flank</b> 9°  CCGT09T304M-SMG
Heavy Cutting	M	<b>RR</b> 	<b>Heavy cutting of carbon and alloy steels</b> A wide groove chipbreaker prevents chips from jamming at large depths of cut. Small dimples improve chip control at small depths of cut.	Carbon Steel • Alloy Steel 	<b>28°</b> 0.3 mm  RCMX2006M0-RR
For Cast Iron	M	<b>Flat Top</b> 	<b>Rough cutting of cast iron</b> Flat top. Most effective for unstable machining due to its high edge strength.	Cast Iron 	0°  CCMW09T308
	G	<b>Flat Top</b> 	<b>Chipbreaker for heavy cutting of cast iron</b> Flat top. Most effective for unstable machining due to its high edge strength. Can be used on workpieces requiring close tolerances due to G class insert tolerance.	Cast Iron 	0°  CCGW09T300


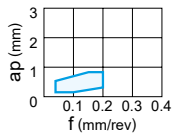
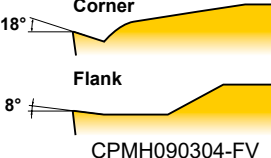
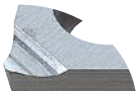
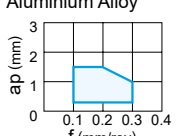
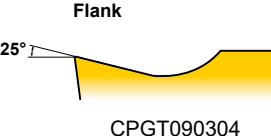
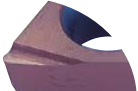
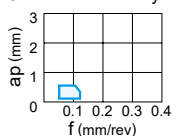
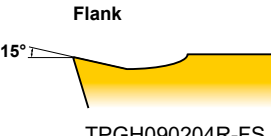

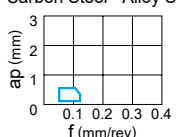
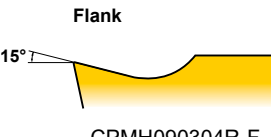

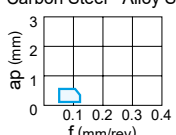
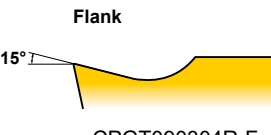

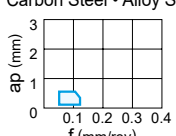
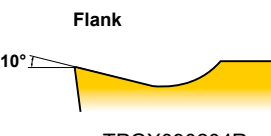
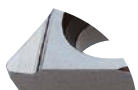
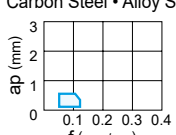
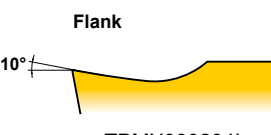
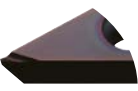
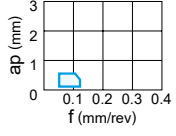
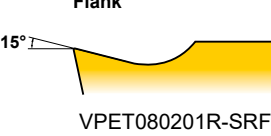

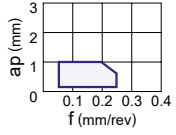
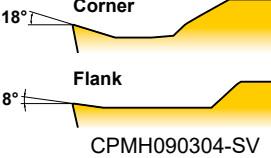
	Rhombic 80° 	Rhombic 55° 	Square 90° 	Triangular 60° 	Rhombic 35° 	Trigon 80° 	Round 	Breaker Name and Cross Section
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	CCGT_R/L-SN  ↻ A144	DCGT_R/L-SN  ↻ A151						R/L-SN(G) 
	CCET_R/L-SN  ↻ A145	DCET_R/L-SN  ↻ A151						R/L-SN(E) 
	CCET_R/LW-SN  ↻ A145	DCET_R/LW-SN  ↻ A152						R/LW-SN 
	CCGT_SMG  ↻ A145	DCGT_SMG  ↻ A152						SMG 
							RCMX_RR  ↻ A154	RR 
	CCMW  ↻ A145	DCMW  ↻ A152	SCMW  ↻ A156	TCMW  ↻ A160	VCMW  ↻ A169			Flat Top(M) 
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# CLASSIFICATION





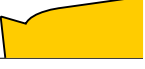















## 11° POSITIVE INSERTS WITH HOLE

TURNING INSERTS

A

Application	Tolerance	Breaker Name and Picture	Features		Cross Section Geometry	
Finish Cutting	M	<b>FV</b> 	<b>First recommendation for finish cutting of carbon, alloy, mild and stainless steels</b> Suitable for low depths of cut and low feed rates. Sharp cutting edge and low resistance design achieves excellent cutting performance.	Carbon Steel • Alloy Steel 	 18° Corner 8° Flank CPMH090304-FV	
		<b>Standard</b> 	<b>Finishing</b> Lead chipbreaker controls chip flow. Good chip control for low to medium feed rates.	Aluminium Alloy 	 25° Flank CPGT090304	
		<b>R/L-FS</b> 	<b>Chipbreaker for finish cutting of carbon, alloy and stainless steels, cast iron and aluminium alloy</b> Small wide lead chipbreaker. Sharp cutting edge gives a good surface finish.	Carbon Steel • Alloy Steel 	 15° Flank TPGH090204R-FS	
	M	G	<b>R/L-F</b> 	<b>Finishing</b> Lead chipbreaker controls chip flow. Sharp cutting edge gives a good surface finish.	Carbon Steel • Alloy Steel 	 15° Flank CPMH090304R-F
			<b>R/L-F</b> 	<b>Finishing</b> Lead chipbreaker controls chip flow. Sharp cutting edge gives a good surface finish.	Carbon Steel • Alloy Steel 	 15° Flank CPGT090304R-F
		G	<b>R/L</b> 	<b>Finishing</b> Lead chipbreaker controls chip flow. Good chip control for low to medium feed rates.	Carbon Steel • Alloy Steel 	 10° Flank TPGX090204R
			<b>L</b> 	<b>Finishing</b> Lead chipbreaker controls chip flow. Good chip control for low to medium feed rates.	Carbon Steel • Alloy Steel 	 10° Flank TPMX090204L
	E	<b>SRF</b> 	<b>Finishing</b> Lead chipbreaker controls chip flow. Sharp cutting edge gives a good surface finish.	Carbon Steel • Alloy Steel 	 15° Flank VPET080201R-SRF	
	Light Cutting	M	<b>SV</b> 	<b>First recommendation for light cutting of carbon, alloy, mild and stainless steels, and cast iron</b> Large rake angle provides sharp cutting action. A peninsular dot ensures chip control at depths of cut under 1mm.	Carbon Steel • Alloy Steel 	 18° Corner 8° Flank CPMH090304-SV




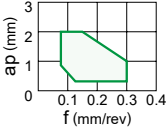
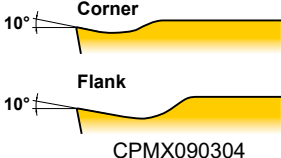


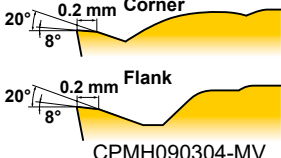

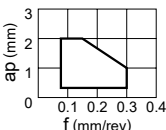
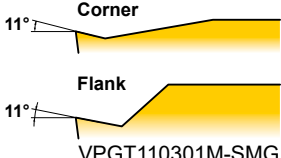

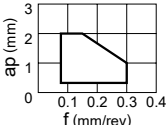


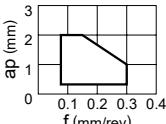

	Rhombic 80° 	Rhombic 55° 	Square 90° 	Triangular 60° 	Rhombic 35° 	Trigon 80° 	Round 	Breaker Name and Cross Section
	CPMH_FV  ➔ A146			TPMH_FV  ➔ A162				FV 
	CPGT  ➔ A146							Standard 
				TPGH_R/L-FS  ➔ A162		WPGT_R/L-FS  ➔ A174		R/L-FS 
	CPMH_R/L-F  ➔ A146							R/L-F(M) 
	CPGT_R/L-F  ➔ A146							R/L-F(G) 
				TPGX_R/L  ➔ A162				R/L 
				TPMX_L  ➔ A163				L 
					VPET_R/L-SRF  ➔ A171			SRF 
	CPMH_SV  ➔ A146			TPMH_SV  ➔ A163				SV 

# CLASSIFICATION


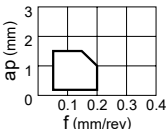
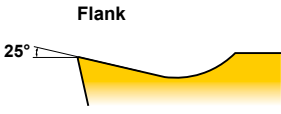
## 11° POSITIVE INSERTS WITH HOLE


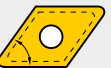














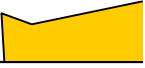





TURNING INSERTS










A

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	M	<p><b>Standard</b></p> 	<p><b>Alternative chipbreaker for medium cutting of carbon, alloy and stainless steels</b></p> <p>Standard, general purpose chipbreaker.</p>	<p>Carbon Steel • Alloy Steel</p>   <p>CPMX090304</p>
	M	<p><b>MV</b></p> 	<p><b>First recommendation for medium cutting of carbon, alloy, mild and stainless steels, and cast iron</b></p> <p>A positive insert and large rake angle achieves sharp cutting edge performance. Double breakers in the rake face achieve a wide range of chip discharge.</p>	<p>Carbon Steel • Alloy Steel</p>   <p>CPMH090304-MV</p>
	G	<p><b>SMG</b></p> 	<p><b>Medium cutting on automatic lathes</b></p> <p>3D moulded chipbreaker provides good chip control. G class insert gives sharp cutting action, allowing high precision machining. Breaker geometry appropriate for copying and back turning.</p>	<p>Carbon Steel • Alloy Steel</p>   <p>VPGT110301M-SMG</p>
For Cast Iron	M	<p><b>Flat Top</b></p> 	<p><b>Rough cutting of cast iron</b></p> <p>Most effective for unstable machining due to its high edge strength.</p>	<p>Cast Iron</p>   <p>SPMW120308</p>
	G	<p><b>Flat Top</b></p> 	<p><b>Chipbreaker for heavy cutting of cast iron</b></p> <p>Most effective for unstable machining due to its high edge strength. Can be used on workpieces requiring close tolerances due to G class insert tolerance.</p>	<p>Cast Iron</p>   <p>SPGX120308</p>

## 15° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
For Aluminium Alloy	G	<p><b>R/L</b></p> 	<p><b>For aluminium alloy cutting</b></p> <p>Lead chipbreaker. Sharp cutting edge gives a good surface finish.</p>	<p>Aluminium Alloy</p>   <p>VDGX160302R</p>


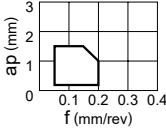
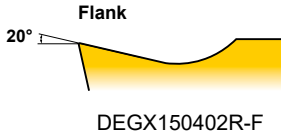
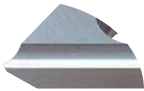
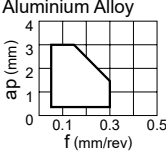
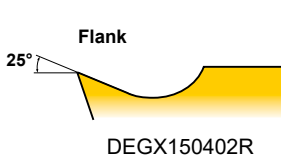
	Rhombic 80° 	Rhombic 55° 	Square 90° 	Triangular 60° 	Rhombic 35° 	Trigon 80° 	Round 	Breaker Name and Cross Section
	<b>CPMX</b>  ↻ A146		<b>SPMT</b>  ↻ A157	<b>TPMX</b>  ↻ A163				<b>Standard</b> 
	<b>CPMH_MV</b>  ↻ A146			<b>TPMH_MV</b>  ↻ A163		<b>WPMT_MV</b>  ↻ A174		<b>MV</b> 
					<b>VPGT_SMG</b>  ↻ A171			<b>SMG</b> 
			<b>SPMW</b>  ↻ A157					<b>Flat Top(M)</b> 
			<b>SPGX</b>  ↻ A157	<b>TPGX</b>  ↻ A163				<b>Flat Top(G)</b> 

	Rhombic 80° 	Rhombic 55° 	Square 90° 	Triangular 60° 	Rhombic 35° 	Trigon 80° 	Round 	Breaker Name and Cross Section
					<b>VDGX_R/L</b>  ↻ A170			<b>R/L</b> 


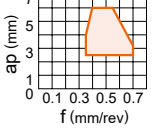
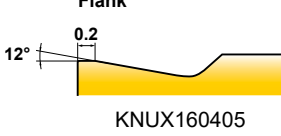

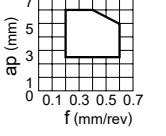
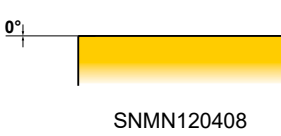

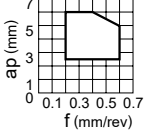
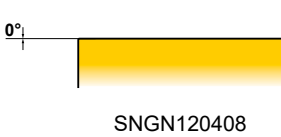
# CLASSIFICATION


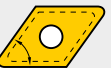





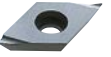




## 20° POSITIVE INSERTS WITH HOLE














TURNING INSERTS  
**A**

Application	Tolerance	Breaker Name and Picture	Features		Cross Section Geometry
For Aluminium Alloy	G	<b>R/L-F</b> 	<b>For aluminium alloy cutting</b> Lead chipbreaker. Sharp cutting edge gives a good surface finish.	Aluminium Alloy 	 Flank 20° DEGX150402R-F
		<b>R/L</b> 	<b>For aluminium alloy cutting</b> A parallel chipbreaker. Sharp cutting edge gives a good surface finish. Good chip control for medium feed rates.	Aluminium Alloy 	 Flank 25° DEGX150402R

## NEGATIVE INSERTS WITHOUT HOLE

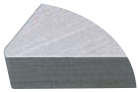
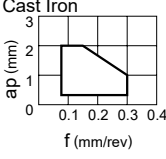

Application	Tolerance	Breaker Name and Picture	Features		Cross Section Geometry
Rough Cutting	M	<b>R/L-M1/2</b> 	<b>Rough cutting of carbon and alloy steels</b> Single sided chipbreaker. Can be used for copying. An angled chipbreaker for controlling chip flow.	Carbon Steel • Alloy Steel 	 Flank 12° 0.2 KNUX160405
For Cast Iron	M	<b>Flat Top</b> 	<b>Rough cutting of cast iron</b> Flat top. Most effective for unstable machining due to high edge strength and stable insert clamping.	Cast Iron 	 0° SNMN120408
	G	<b>Flat Top</b> 	<b>Chipbreaker for heavy cutting of cast iron</b> Flat top. Most effective for unstable machining due to high edge strength and stable insert clamping. Can be used on workpieces requiring close tolerances due to G class insert tolerance.	Cast Iron 	 0° SNGN120408

	Rhombic 80° 	Rhombic 55° 	Square 90° 	Triangular 60° 	Rhombic 35° 	Trigon 80° 	Round 	Breaker Name and Cross Section
		DEGX_R/L-F  ↻ A153						R/L-F 
		DEGX_R/L  ↻ A153		TEGX_R/L  ↻ A161				R/L 


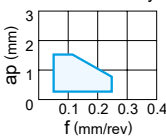
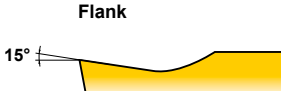

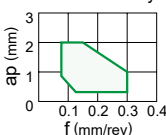
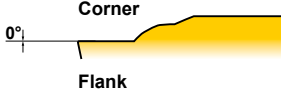

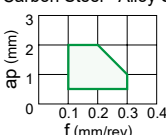
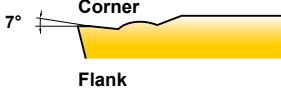

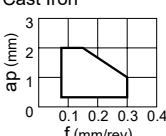


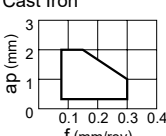

	Rhombic 80° 	Square 90° 	Triangular 60° 	Parallelogram 55° 	Breaker Name and Cross Section
				KNUX_R/L-M1/2  ↻ A135	R/L-M1/2 
	CNMN  ↻ A136	SNMN  ↻ A137	TNMN  ↻ A138		Flat Top(M) 
		SNGN  ↻ A137	TNGN  ↻ A138		Flat Top(G) 

# CLASSIFICATION

## 7° POSITIVE INSERTS WITHOUT HOLE




Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
For Cast Iron	G	<b>Flat Top</b> 	<b>Chipbreaker for heavy cutting of cast iron</b> Flat top. Most effective for unstable machining due to high edge strength and stable insert clamping. Use on workpieces requiring close tolerance inserts.	Cast Iron   TNGN160408



















## 11° POSITIVE INSERTS WITHOUT HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	G	<b>R/L</b> 	<b>Finishing</b> A parallel chipbreaker. Good chip control for low to medium feed rates.	Carbon Steel • Alloy Steel   SPGR090304R
		<b>Standard</b> 	<b>Light to medium cutting of carbon, alloy and stainless steels</b> Standard, general purpose chipbreaker.	Carbon Steel • Alloy Steel   SPMR090308
Light to Medium Cutting	M	<b>80</b> 	<b>Light to medium cutting of carbon steel, alloy steel and stainless steel</b> Large chip pocket for excellent chip evacuation. Double breakers in the rake face achieves a wide range of chip breaking.	Carbon Steel • Alloy Steel   SPMR120308
		<b>Flat Top</b> 	<b>Rough cutting of cast iron</b> Most effective for unstable machining due to high edge strength and stable insert clamping.	Cast Iron   SPMN090308
For Cast Iron	G	<b>Flat Top</b> 	<b>Chipbreaker for heavy cutting of cast iron</b> Most effective for unstable machining due to high edge strength and stable insert clamping. Can be used on workpieces requiring close tolerances due to G class insert tolerance.	Cast Iron   SPGN090308


TURNING INSERTS

A

Triangular 60° 	Breaker Name and Cross Section
TCGN  ↻ A179	<b>Flat Top</b> 

Square 90° 	Triangular 60° 	Round 	Breaker Name and Cross Section
SPGR_R  ↻ A177	TPGR_R/L  ↻ A180		<b>R/L</b> 
SPMR  ↻ A177	TPMR  ↻ A180		<b>Standard</b> 
SPMR-80  ↻ A177	TPMR-80  ↻ A180		<b>80</b> 
SPMN  ↻ A177	TPMN  ↻ A180		<b>Flat Top(M)</b> 
SPGN  ↻ A178	TPGN  ↻ A181		<b>Flat Top(G)</b> 

### SPECIAL PURPOSE INSERTS

Application	Tolerance	Tool Holder Type	Inserts
Special	G	<b>TL Type</b>	<b>RTG</b>  ↻ A176

# TURNING INSERTS

## RECOMMENDED CUTTING CONDITIONS

### NEGATIVE INSERTS

Breaker : Std : Standard Flat : Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
		Symbol	Code						
Mild Steel (St37-2, Ck10)	≤180HB	●	F	1	FY	VP25N	285-450	0.09-0.23	0.20-0.80
		●	F	2	FY	NX2525	270-385	0.09-0.23	0.20-0.80
		●	F	3	FS	NX2525	270-385	0.09-0.23	0.20-0.70
		●	L	1	SY	VP25N	260-410	0.16-0.33	0.50-1.20
		●	L	2	SY	NX2525	245-350	0.16-0.33	0.50-1.20
		●	F	1	FY	MP3025	275-425	0.09-0.23	0.20-0.80
		●	F	2	FY	NX3035	260-370	0.09-0.23	0.20-0.80
		●	F	3	FS	NX2525	270-385	0.09-0.23	0.20-0.70
		●	L	1	SY	MP3025	255-385	0.16-0.33	0.50-1.20
		●	L	2	SY	NX3035	240-340	0.16-0.33	0.50-1.20
		✚	F	1	FY	UE6020	285-465	0.09-0.23	0.20-0.80
		✚	L	1	SY	UE6020	260-425	0.16-0.33	0.50-1.20
Carbon Steel • Alloy Steel (Ck45, 42CrMo4)	180   280HB	●	F	1	FP	NX2525	210-300	0.08-0.25	0.10-1.00
		●	F	2	FH	AP25N	220-345	0.08-0.20	0.20-1.00
		●	F	3	FH	NX2525	210-300	0.08-0.20	0.20-1.00
		●	F	4	R/L-F	MP3025	215-330	0.05-0.15	0.10-0.50
		●	F	5	PK	NX2525	200-285	0.10-0.30	0.20-1.00
		●	L	1	LP	MC6115	250-480	0.10-0.40	0.30-2.00
		●	L	2	LP	MC6125	275-425	0.10-0.40	0.30-2.00
		●	L	3	LP	MC6015	210-360	0.10-0.40	0.30-2.00
		●	L	4	LP	UE6105	225-410	0.10-0.40	0.30-2.00
		●	L	5	SH	MC6115	250-480	0.10-0.40	0.30-2.00
		●	L	6	SH	MC6125	275-425	0.10-0.40	0.30-2.00
		●	L	7	SH	UE6105	225-410	0.10-0.40	0.30-2.00
		●	L	8	LP	MP3025	195-300	0.10-0.40	0.30-2.00
		●	L	9	SH	AP25N	200-315	0.10-0.40	0.30-2.00
		●	L	10	SH	NX2525	190-275	0.10-0.40	0.30-2.00
		●	L	11	SA	MC6115	250-480	0.10-0.40	0.30-2.00
		●	L	12	SA	MC6125	275-425	0.10-0.40	0.30-2.00
		●	L	13	SA	UE6105	225-410	0.10-0.40	0.30-2.00
		●	L	14	SA	NX2525	190-275	0.10-0.40	0.30-2.00
		●	L	15	SW	MC6115	250-480	0.10-0.50	0.30-2.50
		●	L	16	SW	MC6125	275-425	0.10-0.50	0.30-2.50
		●	L	17	SW	UE6105	225-410	0.10-0.50	0.30-2.50
		●	L	18	SW	MP3025	195-300	0.10-0.50	0.30-2.50
		●	L	19	SW	NX2525	190-275	0.10-0.50	0.30-2.50
		●	L	20	R/L-K	MP3025	195-300	0.08-0.20	0.30-1.20
		●	M	1	MP	MC6115	230-440	0.16-0.50	0.30-4.00
		●	M	2	MP	MC6125	250-390	0.16-0.50	0.30-4.00
		●	M	3	MP	MC6015	195-330	0.16-0.50	0.30-4.00
		●	M	4	MP	UE6105	205-375	0.16-0.50	0.30-4.00
		●	M	5	MP	MP3025	180-275	0.16-0.50	0.30-4.00
		●	M	6	MA	MC6115	230-440	0.20-0.50	0.30-4.00
●	M	7	MA	MC6125	250-390	0.20-0.50	0.30-4.00		
●	M	8	MA	UE6105	205-375	0.20-0.50	0.30-4.00		
●	M	9	MH	UE6105	205-375	0.20-0.55	1.00-4.00		
●	M	10	Std	MC6115	230-440	0.25-0.60	1.50-5.00		
●	M	11	Std	MC6125	250-390	0.25-0.60	1.50-5.00		

CUTTING CONDITIONS : ● : Stable Cutting ● : General Cutting ✚ : Unstable Cutting

CUTTING AREA : F : Finish Cutting L : Light Cutting M : Medium Cutting R : Rough Cutting H : Heavy Cutting



Work Material	Hardness	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)		
P	Carbon Steel • Alloy Steel (Ck45, 42CrMo4)	180   280HB	●	M	12	Std	UE6105	205–375	0.25–0.60	1.50–5.00
			●	M	13	Std	MP3025	180–275	0.25–0.60	1.50–5.00
			●	M	14	Std	NX2525	175–250	0.25–0.60	1.50–5.00
			●	M	15	Std	UTi20T	90–130	0.25–0.60	1.50–5.00
			●	M	16	MW	MC6115	230–440	0.20–0.60	0.90–4.00
			●	M	17	MW	MC6125	250–390	0.20–0.60	0.90–4.00
			●	M	18	MW	UE6105	205–375	0.20–0.60	0.90–4.00
			●	M	19	R/L	MP3025	180–275	0.15–0.32	0.40–2.00
			●	R	1	RP	MC6115	215–415	0.25–0.60	1.50–6.00
			●	R	2	RP	MC6125	235–370	0.25–0.60	1.50–6.00
			●	R	3	RP	MC6015	185–310	0.25–0.60	1.50–6.00
			●	R	4	RP	UE6105	190–355	0.25–0.60	1.50–6.00
			●	R	5	GH	MC6115	215–415	0.25–0.60	1.50–6.00
			●	R	6	GH	MC6125	235–370	0.25–0.60	1.50–6.00
			●	R	7	GH	UE6105	190–355	0.25–0.60	1.50–6.00
			●	H	1	HX	MC6025	165–265	0.50–1.26	3.00–11.00
			●	H	2	HX	UE6110	165–280	0.50–1.26	3.00–11.00
			●	H	3	HV	MC6025	135–220	0.70–1.30	4.00–12.00
			●	H	4	HV	UE6110	135–230	0.70–1.30	4.00–12.00
			●	H	5	HZ	MC6025	165–265	0.40–1.20	2.00–10.00
			●	H	6	HZ	UE6110	165–280	0.40–1.20	2.00–10.00
			●	H	7	HL	MC6025	165–265	0.40–1.00	1.50–8.00
			●	H	8	HL	UE6110	165–280	0.40–1.00	1.50–8.00
			●	H	9	HM	MC6025	165–265	0.50–1.10	2.00–10.00
			●	H	10	HM	UE6110	165–280	0.50–1.10	2.00–10.00
			●	F	1	FP	MP3025	215–330	0.08–0.25	0.10–1.00
			●	F	2	FH	MP3025	215–330	0.08–0.20	0.20–1.00
			●	F	3	FH	NX3035	200–285	0.08–0.20	0.20–1.00
			●	F	4	FH	UE6110	230–395	0.08–0.20	0.20–1.00
			●	L	1	LP	MC6115	250–480	0.10–0.40	0.30–2.00
			●	L	2	LP	MC6125	275–425	0.10–0.40	0.30–2.00
			●	L	3	LP	MC6015	210–360	0.10–0.40	0.30–2.00
			●	L	4	SH	MC6115	250–480	0.10–0.40	0.30–2.00
			●	L	5	SH	MC6125	275–425	0.10–0.40	0.30–2.00
			●	L	6	SH	MC6015	210–360	0.10–0.40	0.30–2.00
			●	L	7	SA	MC6115	250–480	0.10–0.40	0.30–2.00
			●	L	8	SA	MC6125	275–425	0.10–0.40	0.30–2.00
			●	L	9	SA	MC6015	210–360	0.10–0.40	0.30–2.00
			●	L	10	LP	UE6110	210–360	0.10–0.40	0.30–2.00
			●	L	11	SH	UE6110	210–360	0.10–0.40	0.30–2.00
●	L	12	SA	UE6110	210–360	0.10–0.40	0.30–2.00			
●	L	13	LP	MP3025	195–300	0.10–0.40	0.30–2.00			
●	L	14	SH	NX3035	185–260	0.10–0.40	0.30–2.00			
●	L	15	SA	NX3035	185–260	0.10–0.40	0.30–2.00			
●	L	16	SW	MC6115	250–480	0.10–0.50	0.30–2.50			
●	L	17	SW	MC6125	275–425	0.10–0.50	0.30–2.50			
●	L	18	SW	MC6015	210–360	0.10–0.50	0.30–2.50			
●	L	19	SW	UE6110	210–360	0.10–0.50	0.30–2.50			

A

TURNING INSERTS

# TURNING INSERTS

## RECOMMENDED CUTTING CONDITIONS

### NEGATIVE INSERTS

Breaker : Std : Standard Flat : Flat Top

Work Material	Hardness	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	
P Carbon Steel • Alloy Steel (Ck45, 42CrMo4)	180   280HB	●	L	20	SW	NX3035	185–260	0.10–0.50	0.30–2.50
		●	M	1	MP	MC6125	250–390	0.16–0.50	0.30–4.00
		●	M	2	MP	MC6115	230–440	0.16–0.50	0.30–4.00
		●	M	3	MP	MC6015	195–330	0.16–0.50	0.30–4.00
		●	M	4	MA	MC6125	250–390	0.20–0.50	0.30–4.00
		●	M	5	MA	MC6115	230–440	0.20–0.50	0.30–4.00
		●	M	6	MA	MC6015	195–330	0.20–0.50	0.30–4.00
		●	M	7	MH	MC6125	250–390	0.20–0.55	1.00–4.00
		●	M	8	MH	MC6115	230–440	0.20–0.55	1.00–4.00
		●	M	9	MH	MC6015	195–330	0.20–0.55	1.00–4.00
		●	M	10	Std	MC6125	250–390	0.25–0.60	1.50–5.00
		●	M	11	Std	MC6115	230–440	0.25–0.60	1.50–5.00
		●	M	12	Std	MC6015	195–330	0.25–0.60	1.50–5.00
		●	M	13	MP	UE6110	195–330	0.16–0.50	0.30–4.00
		●	M	14	MA	UE6110	195–330	0.20–0.50	0.30–4.00
		●	M	15	MA	NX3035	170–240	0.20–0.50	0.30–4.00
		●	M	16	MH	UE6110	195–330	0.20–0.55	1.00–4.00
		●	M	17	Std	UE6110	195–330	0.25–0.60	1.50–5.00
		●	M	18	Std	NX3035	170–240	0.25–0.60	1.50–5.00
		●	M	19	MW	MC6125	250–390	0.20–0.60	0.90–4.00
		●	M	20	MW	MC6115	230–440	0.20–0.60	0.90–4.00
		●	M	21	MW	MC6015	195–330	0.20–0.60	0.90–4.00
		●	M	22	MW	UE6110	195–330	0.20–0.60	0.90–4.00
		●	R	1	RP	MC6125	235–370	0.25–0.60	1.50–6.00
		●	R	2	RP	MC6115	215–415	0.25–0.60	1.50–6.00
		●	R	3	RP	MC6015	185–310	0.25–0.60	1.50–6.00
		●	R	4	RP	UE6110	185–310	0.25–0.60	1.50–6.00
		●	R	5	GH	MC6125	235–370	0.25–0.60	1.50–6.00
		●	R	6	GH	MC6115	215–415	0.25–0.60	1.50–6.00
		●	R	7	GH	UE6110	185–310	0.25–0.60	1.50–6.00
		●	H	1	HX	MC6025	165–265	0.50–1.26	3.00–11.00
		●	H	2	HV	MC6025	135–220	0.70–1.30	4.00–12.00
		●	H	3	HZ	MC6025	165–265	0.40–1.20	2.00–10.00
		●	H	4	HL	MC6025	165–265	0.40–1.00	1.50–8.00
		●	H	5	HM	MC6025	165–265	0.50–1.10	2.00–10.00
		●	H	6	HR	MC6025	135–220	0.70–1.30	3.00–12.00
		●	H	7	HZ	UE6110	165–280	0.40–1.20	2.00–10.00
		✦	F	1	FP	MC6025	230–375	0.08–0.25	0.10–1.00
		✦	F	2	FP	MC6015	230–395	0.08–0.25	0.10–1.00
		✦	F	3	FH	UE6110	230–395	0.08–0.20	0.20–1.00
		✦	L	1	LP	MC6125	275–425	0.10–0.40	0.30–2.00
		✦	L	2	LP	MC6025	210–345	0.10–0.40	0.30–2.00
✦	L	3	LP	MC6035	185–260	0.10–0.40	0.30–2.00		
✦	L	4	SH	MC6125	275–425	0.10–0.40	0.30–2.00		
✦	L	5	SH	MC6025	210–345	0.10–0.40	0.30–2.00		
✦	L	6	SA	MC6125	275–425	0.10–0.40	0.30–2.00		
✦	L	7	SA	MC6025	210–345	0.10–0.40	0.30–2.00		
✦	L	8	SA	UE6020	200–330	0.10–0.40	0.30–2.00		

CUTTING CONDITIONS : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

CUTTING AREA : F : Finish Cutting L : Light Cutting M : Medium Cutting R : Rough Cutting H : Heavy Cutting

Work Material	Hardness	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	
P Carbon Steel • Alloy Steel (Ck45, 42CrMo4)	180   280HB	✚	M	1	MP	MC6125	250–390	0.16–0.50	0.30–4.00
		✚	M	2	MP	MC6025	195–315	0.16–0.50	0.30–4.00
		✚	M	3	MP	MC6035	170–240	0.16–0.50	0.30–4.00
		✚	M	4	MA	MC6125	250–390	0.20–0.50	0.30–4.00
		✚	M	5	MA	MC6025	195–315	0.20–0.50	0.30–4.00
		✚	M	6	MA	MC6035	170–240	0.20–0.50	0.30–4.00
		✚	M	7	MH	MC6125	250–390	0.20–0.55	1.00–4.00
		✚	M	8	MH	MC6025	195–315	0.20–0.55	1.00–4.00
		✚	M	9	MH	MC6035	170–240	0.20–0.55	1.00–4.00
		✚	M	10	Std	MC6125	250–390	0.25–0.60	1.50–5.00
		✚	M	11	Std	MC6025	195–315	0.25–0.60	1.50–5.00
		✚	M	12	Std	MC6035	170–240	0.25–0.60	1.50–5.00
		✚	M	13	MW	MC6125	250–390	0.20–0.60	0.90–4.00
		✚	M	14	MW	MC6025	195–315	0.20–0.60	0.90–4.00
		✚	R	1	RP	MC6125	235–370	0.25–0.60	1.50–6.00
		✚	R	2	RP	MC6025	185–295	0.25–0.60	1.50–6.00
		✚	R	3	RP	MC6035	160–225	0.25–0.60	1.50–6.00
		✚	R	4	GH	MC6125	235–370	0.25–0.60	1.50–6.00
		✚	H	1	HX	MC6035	140–200	0.50–1.26	3.00–11.00
		✚	H	2	HX	UH6400	140–195	0.50–1.26	3.00–11.00
		✚	H	3	HV	MC6035	115–165	0.70–1.30	4.00–12.00
		✚	H	4	HV	UH6400	115–160	0.70–1.30	4.00–12.00
		✚	H	5	HZ	MC6035	140–200	0.40–1.20	2.00–10.00
		✚	H	6	HZ	UH6400	140–195	0.40–1.20	2.00–10.00
		✚	H	7	HL	MC6035	140–200	0.40–1.00	1.50–8.00
		✚	H	8	HM	MC6035	140–200	0.50–1.10	2.00–10.00
		✚	H	9	HR	MC6035	115–165	0.70–1.30	3.00–12.00

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TURNING INSERTS

# TURNING INSERTS

## RECOMMENDED CUTTING CONDITIONS

### NEGATIVE INSERTS

Breaker : Std : Standard Flat : Flat Top

Work Material	Hardness	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	
Austenitic Stainless Steel (X5CrNi189, X5CrNiMo1810)	≤200HB	●	L	1	LM	MC7015	180-285	0.10-0.30	0.30-2.00
		●	L	2	SH	US735	95-185	0.10-0.40	0.30-2.00
		●	L	3	SH	NX2525	65-135	0.10-0.40	0.30-2.00
		●	M	1	MM	MC7015	165-260	0.15-0.45	0.70-5.00
		●	M	2	GM	MC7015	165-260	0.16-0.50	0.50-4.00
		●	R	1	RM	MC7015	155-245	0.25-0.55	1.50-6.00
		●	H	1	HL	US735	75-140	0.40-1.00	1.50-8.00
		●	H	2	HL	US735	75-140	0.40-1.00	1.50-8.00
		●	L	1	LM	MC7025	165-220	0.10-0.30	0.30-2.00
		●	L	2	SH	US735	95-185	0.10-0.40	0.30-2.00
		●	M	1	MM	MC7025	150-200	0.15-0.45	0.70-5.00
		●	M	2	GM	MC7025	150-200	0.16-0.50	0.50-4.00
		●	M	3	MA	MC7025	150-200	0.20-0.50	0.30-4.00
		●	M	4	MS	US735	90-170	0.16-0.50	0.50-4.00
		●	M	5	MA	US735	90-170	0.20-0.50	0.30-4.00
		●	R	1	RM	MC7025	140-190	0.25-0.55	1.50-6.00
		●	R	2	GH	US735	85-160	0.25-0.60	1.50-6.00
		●	H	1	HL	US735	75-140	0.40-1.00	1.50-8.00
		●	H	2	HM	US735	75-140	0.50-1.10	2.00-10.00
		●	L	1	LM	MP7035	95-155	0.10-0.30	0.30-2.00
		●	L	2	SH	US735	95-185	0.10-0.40	0.30-2.00
		●	M	1	MM	MP7035	90-145	0.15-0.45	0.70-5.00
		●	M	2	GM	MP7035	90-145	0.16-0.50	0.50-4.00
		●	M	3	MA	MP7035	90-145	0.20-0.50	0.30-4.00
		●	M	4	MS	US735	90-170	0.16-0.50	0.50-4.00
		●	M	5	MS	VP15TF	80-135	0.16-0.50	0.50-4.00
		●	M	6	MS	UP20M	100-150	0.16-0.50	0.50-4.00
		●	M	7	MS	UTi20T	80-115	0.16-0.50	0.50-4.00
		●	M	8	MA	VP15TF	80-135	0.20-0.50	0.30-4.00
		●	M	9	Std	VP15TF	80-135	0.25-0.60	1.50-5.00
		●	R	1	RM	MP7035	85-135	0.25-0.55	1.50-6.00
		●	R	2	GH	US735	85-160	0.25-0.60	1.50-6.00
		●	H	1	HL	US735	75-140	0.40-1.00	1.50-8.00
●	H	2	HM	US735	75-140	0.50-1.10	2.00-10.00		
Austenitic Stainless Steel (X2CrNiN1810, X2CrNiMoN1813)	>200HB	●	L	1	LM	MC7015	150-240	0.10-0.30	0.30-2.00
		●	L	2	SH	US735	80-155	0.10-0.40	0.30-2.00
		●	L	3	SH	NX2525	55-115	0.10-0.40	0.30-2.00
		●	M	1	MM	MC7015	135-215	0.15-0.45	0.70-5.00
		●	M	2	GM	MC7015	135-215	0.16-0.50	0.50-4.00
		●	R	1	RM	MC7015	130-205	0.25-0.55	1.50-6.00
		●	H	1	HL	US735	60-120	0.40-1.00	1.50-8.00
		●	H	2	HM	US735	60-120	0.50-1.10	2.00-10.00
		●	L	1	LM	MC7025	135-180	0.10-0.30	0.30-2.00
		●	L	2	SH	US735	80-155	0.10-0.40	0.30-2.00
		●	M	1	MM	MC7025	125-165	0.15-0.45	0.70-5.00
		●	M	2	GM	MC7025	125-165	0.16-0.50	0.50-4.00
		●	M	3	MA	MC7025	125-165	0.20-0.50	0.30-4.00
		●	M	4	MS	US735	75-140	0.16-0.50	0.50-4.00

CUTTING CONDITIONS : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

CUTTING AREA : F : Finish Cutting L : Light Cutting M : Medium Cutting R : Rough Cutting H : Heavy Cutting

Work Material	Hardness	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	
Austenitic Stainless Steel (X2CrNiN1810, X2CrNiMoN1813)	>200HB	●	M	5	MA	US735	75—140	0.20—0.50	0.30—4.00
		●	R	1	RM	MC7025	115—155	0.25—0.55	1.50—6.00
		●	R	2	GH	US735	70—135	0.25—0.60	1.50—6.00
		●	H	1	HL	US735	60—120	0.40—1.00	1.50—8.00
		●	H	2	HM	US735	60—120	0.50—1.10	2.00—10.00
		⊕	L	1	LM	MP7035	80—130	0.10—0.30	0.30—2.00
		⊕	L	2	SH	US735	80—155	0.10—0.40	0.30—2.00
		⊕	M	1	MM	MP7035	75—120	0.15—0.45	0.70—5.00
		⊕	M	2	GM	MP7035	75—120	0.16—0.50	0.50—4.00
		⊕	M	3	MA	MP7035	75—120	0.20—0.50	0.30—4.00
		⊕	M	4	MS	US735	75—140	0.16—0.50	0.50—4.00
		⊕	M	5	MS	VP15TF	65—110	0.16—0.50	0.50—4.00
		⊕	M	6	MS	UP20M	80—125	0.16—0.50	0.50—4.00
		⊕	M	7	MS	UTi20T	65—95	0.16—0.50	0.50—4.00
		⊕	M	8	MA	VP15TF	65—110	0.20—0.50	0.30—4.00
		⊕	M	9	Std	VP15TF	65—110	0.25—0.60	1.50—5.00
		⊕	R	1	RM	MP7035	70—115	0.25—0.55	1.50—6.00
		⊕	R	2	GH	US735	70—135	0.25—0.60	1.50—6.00
⊕	H	1	HL	US735	60—120	0.40—1.00	1.50—8.00		
⊕	H	2	HM	US735	60—120	0.50—1.10	2.00—10.00		
M Two-phase Stainless Steel (X3CrNiCu1894)	≤280HB	●	L	1	LM	MC7015	120—190	0.10—0.30	0.30—2.00
		●	L	2	SH	US735	65—125	0.10—0.40	0.30—2.00
		●	L	3	SH	NX2525	40—90	0.10—0.40	0.30—2.00
		●	M	1	MM	MC7015	110—175	0.15—0.45	0.70—5.00
		●	M	2	GM	MC7015	110—175	0.16—0.50	0.50—4.00
		●	R	1	RM	MC7015	105—165	0.25—0.55	1.50—6.00
		●	H	1	HL	US735	50—95	0.40—1.00	1.50—8.00
		●	H	2	HM	US735	50—95	0.50—1.10	2.00—10.00
		●	L	1	LM	MC7025	110—145	0.10—0.30	0.30—2.00
		●	L	2	SH	US735	65—125	0.10—0.40	0.30—2.00
		●	M	1	MM	MC7025	100—135	0.15—0.45	0.70—5.00
		●	M	2	GM	MC7025	100—135	0.16—0.50	0.50—4.00
		●	M	3	MA	MC7025	100—135	0.20—0.50	0.30—4.00
		●	M	4	MS	US735	60—115	0.16—0.50	0.50—4.00
		●	M	5	MA	US735	60—115	0.20—0.50	0.30—4.00
		●	R	1	RM	MC7025	95—125	0.25—0.55	1.50—6.00
		●	R	2	GH	US735	55—105	0.25—0.60	1.50—6.00
		●	H	1	HL	US735	50—95	0.40—1.00	1.50—8.00
		●	H	2	HM	US735	50—95	0.50—1.10	2.00—10.00
		⊕	L	1	LM	MP7035	65—105	0.10—0.30	0.30—2.00
		⊕	L	2	SH	US735	65—125	0.10—0.40	0.30—2.00
		⊕	M	1	MM	MP7035	60—95	0.15—0.45	0.70—5.00
		⊕	M	2	GM	MP7035	60—95	0.16—0.50	0.50—4.00
		⊕	M	3	MA	MP7035	60—95	0.20—0.50	0.30—4.00
		⊕	M	4	MS	US735	60—115	0.16—0.50	0.50—4.00
		⊕	M	5	MS	VP15TF	50—90	0.16—0.50	0.50—4.00
		⊕	M	6	MS	UP20M	65—100	0.16—0.50	0.50—4.00
		⊕	M	7	MS	UTi20T	50—75	0.16—0.50	0.50—4.00

# TURNING INSERTS

## RECOMMENDED CUTTING CONDITIONS

### NEGATIVE INSERTS

Breaker : Std : Standard Flat : Flat Top

Work Material	Hardness	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	
Two-phase Stainless Steel (X3CrNiCu1894)	≤280HB	✚	M	8	MA	VP15TF	50-90	0.20-0.50	0.30-4.00
		✚	M	9	Std	VP15TF	50-90	0.25-0.60	1.50-5.00
		✚	R	1	RM	MP7035	55-90	0.25-0.55	1.50-6.00
		✚	R	2	GH	US735	55-105	0.25-0.60	1.50-6.00
		✚	H	1	HL	US735	50-95	0.40-1.00	1.50-8.00
		✚	H	2	HM	US735	50-95	0.50-1.10	2.00-10.00
Ferritic and Martensitic Stainless Steel (X10Cr13, X8Cr17)	≤200HB	●	L	1	LM	MC7015	180-285	0.10-0.30	0.30-2.00
		●	L	2	SH	US735	95-185	0.10-0.40	0.30-2.00
		●	L	3	SH	NX2525	65-135	0.10-0.40	0.30-2.00
		●	M	1	MM	MC7015	165-260	0.15-0.45	0.70-5.00
		●	M	2	GM	MC7015	165-260	0.16-0.50	0.50-4.00
		●	R	1	RM	MC7015	155-245	0.25-0.55	1.50-6.00
		●	H	1	HL	US735	75-140	0.40-1.00	1.50-8.00
		●	H	2	HM	US735	75-140	0.50-1.10	2.00-10.00
		●	L	1	LM	MC7025	165-220	0.10-0.30	0.30-2.00
		●	L	2	SH	US735	95-185	0.10-0.40	0.30-2.00
		●	M	1	MM	MC7025	150-200	0.15-0.45	0.70-5.00
		●	M	2	GM	MC7025	150-200	0.16-0.50	0.50-4.00
		●	M	3	MA	MC7025	150-200	0.20-0.50	0.30-4.00
		●	M	4	MA	US735	90-170	0.20-0.50	0.30-4.00
		●	M	5	MS	US735	90-170	0.16-0.50	0.50-4.00
		●	R	1	RM	MC7025	140-190	0.25-0.55	1.50-6.00
		●	R	2	GH	US735	85-160	0.25-0.60	1.50-6.00
		●	H	1	HL	US735	75-140	0.40-1.00	1.50-8.00
		●	H	2	HM	US735	75-140	0.50-1.10	2.00-10.00
		✚	L	1	LM	MP7035	95-155	0.10-0.30	0.30-2.00
		✚	L	2	SH	US735	95-185	0.10-0.40	0.30-2.00
		✚	M	1	MM	MP7035	90-145	0.15-0.45	0.70-5.00
		✚	M	2	GM	MP7035	90-145	0.16-0.50	0.50-4.00
		✚	M	3	MA	MP7035	90-145	0.20-0.50	0.30-4.00
		✚	M	4	MS	US735	90-170	0.16-0.50	0.50-4.00
		✚	M	5	MS	VP15TF	80-135	0.16-0.50	0.50-4.00
		✚	M	6	MS	UP20M	100-150	0.16-0.50	0.50-4.00
		✚	M	7	MS	UTi20T	80-115	0.16-0.50	0.50-4.00
		✚	M	8	MA	VP15TF	80-135	0.20-0.50	0.30-4.00
		✚	M	9	Std	VP15TF	80-135	0.25-0.60	1.50-5.00
		✚	R	1	RM	MP7035	85-135	0.25-0.55	1.50-6.00
		✚	R	2	GH	US735	85-160	0.25-0.60	1.50-6.00
✚	H	1	HL	US735	75-140	0.40-1.00	1.50-8.00		
✚	H	2	HM	US735	75-140	0.50-1.10	2.00-10.00		
Ferritic and Martensitic Stainless Steel (X17CrNi162, X30Cr13)	>200HB	●	L	1	LM	MC7015	150-240	0.10-0.30	0.30-2.00
		●	L	2	SH	US735	80-155	0.10-0.40	0.30-2.00
		●	L	3	SH	NX2525	55-115	0.10-0.40	0.30-2.00
		●	M	1	MM	MC7015	135-215	0.15-0.45	0.70-5.00
		●	M	2	GM	MC7015	135-215	0.16-0.50	0.50-4.00
		●	R	1	RM	MC7015	130-205	0.25-0.55	1.50-6.00
		●	H	1	HL	US735	60-120	0.40-1.00	1.50-8.00
		●	H	2	HM	US735	60-120	0.50-1.10	2.00-10.00

CUTTING CONDITIONS : ● : Stable Cutting ● : General Cutting ✚ : Unstable Cutting

CUTTING AREA : F : Finish Cutting L : Light Cutting M : Medium Cutting R : Rough Cutting H : Heavy Cutting

Work Material	Hardness	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	
Ferritic and Martensitic Stainless Steel (X17CrNi162, X30Cr13)	>200HB	☉	L	1	LM	MC7025	135–180	0.10–0.30	0.30–2.00
		☉	L	2	SH	US735	80–155	0.10–0.40	0.30–2.00
		☉	M	1	MM	MC7025	125–165	0.15–0.45	0.70–5.00
		☉	M	2	MA	MC7025	125–165	0.20–0.50	0.30–4.00
		☉	M	3	MA	US735	75–140	0.20–0.50	0.30–4.00
		☉	M	4	MS	US735	75–140	0.16–0.50	0.50–4.00
		☉	R	1	RM	MC7025	115–155	0.25–0.55	1.50–6.00
		☉	R	2	GH	US735	70–135	0.25–0.60	1.50–6.00
		☉	H	1	HL	US735	60–120	0.40–1.00	1.50–8.00
		☉	H	2	HM	US735	60–120	0.50–1.10	2.00–10.00
		☉	L	1	LM	MP7035	80–130	0.10–0.30	0.30–2.00
		☉	L	2	SH	US735	80–155	0.10–0.40	0.30–2.00
		☉	M	1	MM	MP7035	75–120	0.15–0.45	0.70–5.00
		☉	M	2	GM	MP7035	75–120	0.16–0.50	0.50–4.00
		☉	M	3	MA	MP7035	75–120	0.20–0.50	0.30–4.00
		☉	M	4	MS	US735	75–140	0.16–0.50	0.50–4.00
		☉	M	5	MS	VP15TF	65–110	0.16–0.50	0.50–4.00
		☉	M	6	MS	UP20M	80–125	0.16–0.50	0.50–4.00
		☉	M	7	MS	UTi20T	65–95	0.16–0.50	0.50–4.00
		☉	M	8	MA	VP15TF	65–110	0.20–0.50	0.30–4.00
☉	M	9	Std	VP15TF	65–110	0.25–0.60	1.50–5.00		
☉	R	1	RM	MP7035	70–115	0.25–0.55	1.50–6.00		
☉	R	2	GH	US735	70–135	0.25–0.60	1.50–6.00		
☉	H	1	HL	US735	60–120	0.40–1.00	1.50–8.00		
☉	H	2	HM	US735	60–120	0.50–1.10	2.00–10.00		
Hardened Stainless Steel (X5CrNiCuNb16-4, X7CrNiAl17-7)	<450HB	●	L	1	LM	MC7015	95–130	0.10–0.30	0.30–2.00
		●	L	2	LS(M)	MP9005	125–175	0.10–0.25	0.20–0.80
		●	L	3	SH	US735	55–100	0.10–0.40	0.30–2.00
		●	L	4	SH	NX2525	35–75	0.10–0.40	0.30–2.00
		●	M	1	MM	MC7015	90–120	0.15–0.45	0.70–5.00
		●	M	2	GM	MC7015	90–120	0.16–0.50	0.50–4.00
		●	M	3	MS	MP9005	115–160	0.15–0.30	0.50–3.00
		●	R	1	RM	MC7015	85–110	0.25–0.55	1.50–6.00
		●	H	1	HL	US735	40–80	0.40–1.00	1.50–8.00
		●	H	2	HM	US735	40–80	0.50–1.10	2.00–10.00
		☉	L	1	LM	MC7025	85–110	0.10–0.30	0.30–2.00
		☉	L	2	SH	US735	55–100	0.10–0.40	0.30–2.00
		☉	L	3	LS(M)	MP9015	120–165	0.10–0.25	0.20–0.80
		☉	M	1	MM	MC7025	80–100	0.15–0.45	0.70–5.00
		☉	M	2	GM	MC7025	80–100	0.16–0.50	0.50–4.00
		☉	M	3	MA	MC7025	80–100	0.10–0.30	0.50–3.00
		☉	M	4	MS	US735	50–95	0.15–0.30	0.50–3.00
		☉	M	5	MA	US735	50–95	0.10–0.30	0.50–3.00
		☉	M	6	MS	MP9015	110–150	0.15–0.30	0.50–3.00
		☉	R	1	RM	MC7025	75–95	0.25–0.55	1.50–6.00
☉	R	2	GH	US735	45–90	0.25–0.60	1.50–6.00		
☉	R	3	RS	MP9015	100–140	0.20–0.35	1.00–4.00		
☉	H	1	HL	US735	40–80	0.40–1.00	1.50–8.00		

M

# TURNING INSERTS

## RECOMMENDED CUTTING CONDITIONS

### NEGATIVE INSERTS

Breaker : Std : Standard Flat : Flat Top

Work Material	Hardness	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	
M Hardened Stainless Steel (X5CrNiCuNb16-4, X7CrNiAl17-7)	<450HB	●	H	2	HM	US735	40-80	0.50-1.10	2.00-10.00
		✚	L	1	LM	MP7035	55-85	0.10-0.30	0.30-2.00
		✚	L	2	SH	US735	55-100	0.10-0.40	0.30-2.00
		✚	L	3	LS(M)	MP9025	80-95	0.10-0.25	0.20-0.80
		✚	M	1	MM	MP7035	50-80	0.15-0.45	0.70-5.00
		✚	M	2	GM	MP7035	50-80	0.16-0.50	0.50-4.00
		✚	M	3	MA	MP7035	50-80	0.10-0.30	0.50-3.00
		✚	M	4	MS	US735	50-95	0.15-0.30	0.50-3.00
		✚	M	5	MS	VP15TF	45-75	0.15-0.30	0.50-3.00
		✚	M	6	MS	UP20M	55-85	0.15-0.30	0.50-3.00
		✚	M	7	MS	UTi20T	45-65	0.15-0.30	0.50-3.00
		✚	M	8	MA	VP15TF	45-75	0.10-0.30	0.50-3.00
		✚	M	9	Std	VP15TF	45-75	0.25-0.60	1.50-5.00
		✚	M	10	MS	MP9025	75-90	0.15-0.30	0.50-3.00
		✚	R	1	RM	MP7035	45-75	0.25-0.55	1.50-6.00
		✚	R	2	GH	US735	45-90	0.25-0.60	1.50-6.00
		✚	R	3	RS	MP9025	70-85	0.20-0.35	1.00-4.00
		✚	H	1	HL	US735	40-80	0.40-1.00	1.50-8.00
✚	H	2	HM	US735	40-80	0.50-1.10	2.00-10.00		

TURNING INSERTS

A

CUTTING CONDITIONS : ● : Stable Cutting ● : General Cutting ✚ : Unstable Cutting

CUTTING AREA : F : Finish Cutting L : Light Cutting M : Medium Cutting R : Rough Cutting H : Heavy Cutting



Work Material	Tensile Strength	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)			
Gray Cast Iron (GG30)	≤350MPa	●	L	1	LK	MC5005	230—365	0.10—0.40	0.30—2.00		
		●	L	2	MA	MC5005	210—335	0.20—0.50	0.30—4.00		
		●	M	1	MK	MC5005	210—335	0.20—0.55	1.00—4.00		
		●	M	2	GK	MC5005	210—335	0.25—0.60	1.50—5.00		
		●	M	3	Std	NX2525	155—210	0.25—0.60	1.50—5.00		
		●	M	4	MW	MC5005	210—335	0.20—0.60	0.90—4.00		
		●	R	1	RK	MC5005	195—315	0.25—0.60	1.50—6.00		
		●	R	2	Flat	MC5005	195—315	0.20—0.60	2.50—6.00		
		●	R	3	Flat	HTi10	95—140	0.20—0.60	2.50—6.00		
		●	H	1	Flat	MC5005	195—315	0.20—0.60	2.50—6.00		
		●	L	1	LK	MC5015	205—335	0.10—0.40	0.30—2.00		
		●	L	2	MA	MC5015	190—305	0.20—0.50	0.30—4.00		
		●	L	3	SW	MC5015	205—335	0.10—0.50	0.30—2.50		
		●	M	1	MK	MC5015	190—305	0.20—0.55	1.00—4.00		
		●	M	2	GK	MC5015	190—305	0.25—0.60	1.50—5.00		
		●	M	3	Std	HTi10	105—150	0.25—0.60	1.50—5.00		
		●	M	4	MW	MC5015	190—305	0.20—0.60	0.90—4.00		
		●	R	1	RK	MC5015	180—285	0.25—0.60	1.50—6.00		
		●	R	2	Flat	MC5015	180—285	0.20—0.60	2.50—6.00		
		●	H	1	Flat	MC5015	180—285	0.20—0.60	2.50—6.00		
		⊕	L	1	LK	MC5015	205—335	0.10—0.40	0.30—2.00		
		⊕	L	2	MA	MC5015	190—305	0.20—0.50	0.30—4.00		
		⊕	M	1	MK	MC5015	190—305	0.20—0.55	1.00—4.00		
		⊕	M	2	GK	MC5015	190—305	0.25—0.60	1.50—5.00		
		⊕	M	3	Std	UTi20T	85—120	0.25—0.60	1.50—5.00		
		⊕	R	1	RK	MC5015	180—285	0.25—0.60	1.50—6.00		
		⊕	R	2	Flat	MC5015	180—285	0.20—0.60	2.50—6.00		
		⊕	R	3	Flat	UTi20T	80—110	0.20—0.60	2.50—6.00		
		⊕	H	1	Flat	MC5015	180—285	0.20—0.60	2.50—6.00		
		Ductile Cast Iron (GGG40)	≤450MPa	●	L	1	LK	MC5005	215—350	0.10—0.40	0.30—2.00
				●	L	2	MA	MC5005	195—315	0.20—0.50	0.30—4.00
				●	M	1	MK	MC5005	195—315	0.20—0.55	1.00—4.00
●	M			2	GK	MC5005	195—315	0.25—0.60	1.50—5.00		
●	M			3	Std	NX2525	145—195	0.25—0.60	1.50—5.00		
●	R			1	RK	MC5005	185—300	0.25—0.60	1.50—6.00		
●	R			2	Flat	MC5005	185—300	0.20—0.60	2.50—6.00		
●	R			3	Flat	HTi10	90—135	0.20—0.60	2.50—6.00		
●	H			1	Flat	MC5005	185—300	0.20—0.60	2.50—6.00		
●	L			1	LK	MC5015	195—315	0.10—0.40	0.30—2.00		
●	L			2	MA	MC5015	180—285	0.20—0.50	0.30—4.00		
●	L			3	SW	MC5015	195—315	0.10—0.50	0.30—2.50		
●	M			1	MK	MC5015	180—285	0.20—0.55	1.00—4.00		
●	M			2	GK	MC5015	180—285	0.25—0.60	1.50—5.00		
●	M			3	Std	HTi10	95—140	0.25—0.60	1.50—5.00		
●	R			1	RK	MC5015	170—275	0.25—0.60	1.50—6.00		
●	R			2	Flat	MC5015	170—275	0.20—0.60	2.50—6.00		
●	H			1	Flat	MC5015	170—275	0.20—0.60	2.50—6.00		
⊕	L			1	LK	MC5015	195—315	0.10—0.40	0.30—2.00		

# TURNING INSERTS

## RECOMMENDED CUTTING CONDITIONS

### NEGATIVE INSERTS

Breaker : Std : Standard Flat : Flat Top

Work Material	Tensile Strength	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	
Ductile Cast Iron (GGG40)	≤450MPa	✚	L	2	MA	MC5015	180-285	0.20-0.50	0.30-4.00
		✚	M	1	MK	MC5015	180-285	0.20-0.55	1.00-4.00
		✚	M	2	GK	MC5015	180-285	0.25-0.60	1.50-5.00
		✚	M	3	Std	UTi20T	80-110	0.25-0.60	1.50-5.00
		✚	R	1	RK	MC5015	170-275	0.25-0.60	1.50-6.00
		✚	R	2	Flat	MC5015	170-275	0.20-0.60	2.50-6.00
		✚	R	3	Flat	UTi20T	75-105	0.20-0.60	2.50-6.00
Ductile Cast Iron (GGG70)	≤800MPa	●	L	1	LK	MC5005	195-310	0.10-0.40	0.30-2.00
		●	L	2	MA	MC5005	175-280	0.20-0.50	0.30-4.00
		●	M	1	MK	MC5005	175-280	0.20-0.55	1.00-4.00
		●	M	2	GK	MC5005	175-280	0.25-0.60	1.50-5.00
		●	M	3	Std	NX2525	130-175	0.25-0.60	1.50-5.00
		●	R	1	RK	MC5005	165-270	0.25-0.60	1.50-6.00
		●	R	2	Flat	MC5005	165-270	0.20-0.60	2.50-6.00
		●	R	3	Flat	HTi10	80-120	0.20-0.60	2.50-6.00
		●	H	1	Flat	MC5005	165-270	0.20-0.60	2.50-6.00
		●	L	1	LK	MC5015	175-285	0.10-0.40	0.30-2.00
		●	L	2	MA	MC5015	160-255	0.20-0.50	0.30-4.00
		●	L	3	SW	MC5015	175-285	0.10-0.50	0.30-2.50
		●	M	1	MK	MC5015	160-255	0.20-0.55	1.00-4.00
		●	M	2	GK	MC5015	160-255	0.25-0.60	1.50-5.00
		●	M	3	Std	HTi10	85-125	0.25-0.60	1.50-5.00
		●	R	1	RK	MC5015	150-245	0.25-0.60	1.50-6.00
		●	R	2	Flat	MC5015	150-245	0.20-0.60	2.50-6.00
		●	H	1	Flat	MC5015	150-245	0.20-0.60	2.50-6.00
		✚	L	1	LK	MC5015	175-285	0.10-0.40	0.30-2.00
		✚	L	2	MA	MC5015	160-255	0.20-0.50	0.30-4.00
		✚	M	1	MK	MC5015	160-255	0.20-0.55	1.00-4.00
		✚	M	2	GK	MC5015	160-255	0.25-0.60	1.50-5.00
		✚	M	3	Std	UTi20T	70-100	0.25-0.60	1.50-5.00
		✚	R	1	RK	MC5015	150-245	0.25-0.60	1.50-6.00
		✚	R	2	Flat	MC5015	150-245	0.20-0.60	2.50-6.00
		✚	R	3	Flat	UTi20T	65-95	0.20-0.60	2.50-6.00
		✚	H	1	Flat	MC5015	150-245	0.20-0.60	2.50-6.00

CUTTING CONDITIONS : ● : Stable Cutting ● : General Cutting ✚ : Unstable Cutting

CUTTING AREA : F : Finish Cutting L : Light Cutting M : Medium Cutting R : Rough Cutting H : Heavy Cutting

Work Material	Hardness	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)			
Titanium Alloy (Ti-6Al-4V)	—	●	F	1	LS(M)	MT9015	40—85	0.10—0.25	0.20—0.80		
		●	F	2	FJ	RT9010	45—95	0.07—0.20	0.10—1.00		
		●	L	1	LS(M)	MT9015	40—85	0.10—0.25	0.20—0.80		
		●	L	2	MJ(M)	RT9010	40—85	0.07—0.25	0.40—1.50		
		●	M	1	MS	MT9015	40—80	0.15—0.30	0.50—3.00		
		●	M	2	MS	RT9010	40—80	0.15—0.30	0.50—3.00		
		●	R	1	RS	MT9015	35—75	0.20—0.35	1.00—4.00		
		●	R	2	GJ	RT9010	35—75	0.16—0.35	1.00—3.00		
		●	F	1	LS(M)	MT9015	40—85	0.10—0.25	0.20—0.80		
		●	F	2	FJ	RT9010	45—95	0.07—0.20	0.10—1.00		
		●	L	1	LS(M)	MT9015	40—85	0.10—0.25	0.20—0.80		
		●	L	2	MJ(M)	RT9010	40—85	0.07—0.25	0.40—1.50		
		●	L	3	MJ(G)	RT9010	40—85	0.07—0.25	0.40—1.50		
		●	M	1	MS	MT9015	40—80	0.15—0.30	0.50—3.00		
		●	M	2	MS	RT9010	40—80	0.15—0.30	0.50—3.00		
		●	R	1	RS	MT9015	35—75	0.20—0.35	1.00—4.00		
		●	R	2	GJ	RT9010	35—75	0.16—0.35	1.00—3.00		
		⊕	F	1	LS(M)	MT9015	40—85	0.10—0.25	0.20—0.80		
		⊕	F	2	FJ	RT9010	45—95	0.07—0.20	0.10—1.00		
		⊕	L	1	LS(M)	MT9015	40—85	0.10—0.25	0.20—0.80		
		⊕	L	2	MJ(M)	RT9010	40—85	0.07—0.25	0.40—1.50		
		⊕	L	3	MJ(G)	RT9010	40—85	0.07—0.25	0.40—1.50		
		⊕	M	1	MS	MT9015	40—80	0.15—0.30	0.50—3.00		
		⊕	R	1	RS	MT9015	35—75	0.20—0.35	1.00—4.00		
		⊕	R	2	GJ	RT9010	35—75	0.16—0.35	1.00—3.00		
		Heat Resistant Alloy (Inconel718)	—	●	F	1	LS(M)	MP9005	30—110	0.10—0.25	0.20—0.80
				●	F	2	FJ	VP10RT	30—60	0.07—0.20	0.10—1.00
				●	L	1	LS(M)	MP9005	30—110	0.10—0.25	0.20—0.80
●	L			2	MJ(M)	MP9005	30—110	0.07—0.25	0.40—1.50		
●	L			3	MJ(M)	VP05RT	30—65	0.07—0.25	0.40—1.50		
●	L			4	MJ(M)	US905	55—110	0.07—0.25	0.40—1.50		
●	L			5	MJ(G)	VP10RT	25—55	0.07—0.25	0.40—1.50		
●	M			1	MS	MP9005	30—100	0.15—0.30	0.50—3.00		
●	M			2	MS	VP05RT	30—60	0.15—0.30	0.50—3.00		
●	M			3	MS	US905	50—100	0.15—0.30	0.50—3.00		
●	R			1	RS	MP9015	20—75	0.20—0.35	1.00—4.00		
●	R			2	GJ	VP10RT	20—45	0.16—0.35	1.00—3.00		
●	R			3	GJ	US905	45—95	0.16—0.35	1.00—3.00		
●	F			1	LS(M)	MP9015	25—85	0.10—0.25	0.20—0.80		
●	F			2	FJ	VP10RT	30—60	0.07—0.20	0.10—1.00		
●	L			1	LS(M)	MP9015	25—85	0.10—0.25	0.20—0.80		
●	L			2	MJ(M)	MP9015	25—80	0.07—0.25	0.40—1.50		
●	L			3	MJ(M)	VP10RT	25—55	0.07—0.25	0.40—1.50		
●	M			1	MS	MP9015	25—80	0.15—0.30	0.50—3.00		
●	M			2	MA	MP9015	25—80	0.10—0.30	0.50—3.00		
●	M			3	MS	VP10RT	25—50	0.15—0.30	0.50—3.00		
●	R			1	RS	MP9015	20—75	0.20—0.35	1.00—4.00		
●	R			2	GJ	VP10RT	20—45	0.16—0.35	1.00—3.00		

S

# TURNING INSERTS

## RECOMMENDED CUTTING CONDITIONS

### ■ NEGATIVE INSERTS

Breaker : Std : Standard Flat : Flat Top

Work Material	Hardness	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	
Heat Resistant Alloy (Inconel718)	—	✚	F	1	LS(M)	MP9025	20–30	0.10–0.25	0.20–0.80
		✚	F	2	FJ	VP15TF	20–40	0.07–0.20	0.10–1.00
		✚	L	1	LS(M)	MP9025	20–30	0.10–0.25	0.20–0.80
		✚	L	2	MJ(G)	VP15TF	20–35	0.07–0.25	0.40–1.50
		✚	M	1	MS	MP9025	20–30	0.15–0.30	0.50–3.00
		✚	M	2	MA	MP9025	20–30	0.10–0.30	0.50–3.00
		✚	M	3	MS	VP15TF	20–35	0.15–0.30	0.50–3.00
		✚	R	1	RS	MP9025	15–25	0.20–0.35	1.00–4.00
		✚	R	2	GJ	VP15TF	15–30	0.16–0.35	1.00–3.00

TURNING INSERTS

A

CUTTING CONDITIONS : ● : Stable Cutting ● : General Cutting ✚ : Unstable Cutting

CUTTING AREA : F : Finish Cutting L : Light Cutting M : Medium Cutting R : Rough Cutting H : Heavy Cutting

7° POSITIVE INSERT TYPE

Work Material	Hardness	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	
Mild Steel (St37-2, Ck10)	≤180HB	●	F	1	FP	NX2525	225-320	0.04-0.20	0.20-0.90
		●	F	2	FV	NX2525	225-320	0.04-0.20	0.20-0.90
		●	F	3	R/L-F	MP3025	230-355	0.05-0.12	0.10-0.50
		●	L	1	LP	NX2525	225-320	0.06-0.25	0.20-1.00
		●	L	2	Std	UE6110	210-355	0.08-0.30	0.30-2.00
		●	L	3	MV	MP3025	190-295	0.08-0.30	0.30-2.00
		●	L	4	Std	MP3025	190-295	0.08-0.30	0.30-2.00
		●	M	1	MP	NX2525	185-270	0.08-0.30	0.30-2.00
		●	F	1	FP	MC6015	250-425	0.04-0.20	0.20-0.90
		●	F	2	FP	UE6110	250-425	0.04-0.20	0.20-0.90
		●	F	3	FP	MP3025	230-355	0.04-0.20	0.20-0.90
		●	F	4	FV	MP3025	230-355	0.04-0.20	0.20-0.90
		●	F	5	FV	NX3035	220-310	0.04-0.20	0.20-0.90
		●	L	1	LP	MC6015	250-425	0.06-0.25	0.20-1.00
		●	L	2	LP	UE6110	250-425	0.06-0.25	0.20-1.00
		●	L	3	LP	MP3025	230-355	0.06-0.25	0.20-1.00
		●	L	4	Std	UE6110	210-355	0.08-0.30	0.30-2.00
		●	L	5	SW	MC6015	250-425	0.06-0.24	0.20-1.50
		●	L	6	SW	MP3025	230-355	0.06-0.24	0.20-1.50
		●	M	1	MP	MC6015	210-355	0.08-0.30	0.30-2.00
		●	M	2	MP	UE6110	210-355	0.08-0.30	0.30-2.00
		●	M	3	MP	MP3025	190-295	0.08-0.30	0.30-2.00
		●	M	4	MW	MC6015	210-355	0.10-0.35	0.80-2.50
		⊕	F	1	FP	MC6025	250-405	0.04-0.20	0.20-0.90
		⊕	L	1	LP	MC6025	250-405	0.06-0.25	0.20-1.00
		⊕	L	2	SV	MC6025	250-405	0.06-0.25	0.20-1.00
		⊕	L	3	SW	MC6025	250-405	0.06-0.24	0.20-1.50
		⊕	M	1	MP	MC6025	210-340	0.08-0.30	0.30-2.00
		⊕	M	2	MW	MC6025	210-340	0.10-0.35	0.80-2.50
		Carbon Steel • Alloy Steel (Ck45, 42CrMo4)	180   280HB	●	F	1	FP	NX2525	165-240
●	F			2	FV	NX2525	165-240	0.04-0.20	0.20-0.90
●	F			3	R/L-F	MP3025	170-260	0.05-0.12	0.10-0.50
●	L			1	LP	NX2525	165-240	0.06-0.25	0.20-1.00
●	L			2	Std	UE6110	155-260	0.08-0.30	0.30-2.00
●	L			3	MV	MP3025	140-220	0.08-0.30	0.30-2.00
●	L			4	Std	MP3025	140-220	0.08-0.30	0.30-2.00
●	L			5	SV	MP3025	170-260	0.06-0.25	0.20-1.00
●	L			6	SW	MP3025	170-260	0.06-0.24	0.20-1.50
●	M			1	MP	NX2525	140-200	0.08-0.30	0.30-2.00
●	M			2	MW	MP3025	140-220	0.10-0.35	0.80-2.50
●	F			1	FP	MC6015	185-315	0.04-0.20	0.20-0.90
●	F			2	FP	UE6110	185-315	0.04-0.20	0.20-0.90
●	F			3	FP	MP3025	170-260	0.04-0.20	0.20-0.90
●	F			4	FV	MP3025	170-260	0.04-0.20	0.20-0.90
●	F			5	FV	NX3035	160-230	0.04-0.20	0.20-0.90
●	L			1	LP	MC6015	185-315	0.06-0.25	0.20-1.00

TURNING INSERTS

A

P

# TURNING INSERTS

## RECOMMENDED CUTTING CONDITIONS

### 7° POSITIVE INSERT TYPE

Breaker : Std : Standard Flat : Flat Top

Work Material	Hardness	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	
Carbon Steel • Alloy Steel (Ck45, 42CrMo4)	180   280HB	●	L	2	LP	UE6110	185–315	0.06–0.25	0.20–1.00
		●	L	3	LP	MP3025	170–260	0.06–0.25	0.20–1.00
		●	L	4	Std	UE6110	155–260	0.08–0.30	0.30–2.00
		●	L	5	SW	MC6015	185–315	0.06–0.24	0.20–1.50
		●	L	6	SW	MP3025	170–260	0.06–0.24	0.20–1.50
		●	M	1	MP	MC6015	155–260	0.08–0.30	0.30–2.00
		●	M	2	MP	UE6110	155–260	0.08–0.30	0.30–2.00
		●	M	3	MP	MP3025	140–220	0.08–0.30	0.30–2.00
		●	M	4	MW	MC6015	155–260	0.10–0.35	0.80–2.50
		✦	F	1	FP	MC6025	185–300	0.04–0.20	0.20–0.90
		✦	L	1	LP	MC6025	185–300	0.06–0.25	0.20–1.00
		✦	L	2	SV	MC6025	185–300	0.06–0.25	0.20–1.00
		✦	L	3	SW	MC6025	185–300	0.06–0.24	0.20–1.50
		✦	M	1	MP	MC6025	155–250	0.08–0.30	0.30–2.00
		✦	M	2	MW	MC6025	155–250	0.10–0.35	0.80–2.50
		Carbon Steel • Alloy Steel (40CrNiMoA)	280   350HB	●	M	1	MP	NX2525	95–140
●	M			1	MP	MC6015	110–185	0.08–0.30	0.30–2.00
●	M			2	MP	UE6110	110–185	0.08–0.30	0.30–2.00
●	M			3	MP	MP3025	100–155	0.08–0.30	0.30–2.00
✦	M			1	MP	MC6025	110–175	0.08–0.30	0.30–2.00

A

TURNING INSERTS

P

CUTTING CONDITIONS : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

CUTTING AREA : F : Finish Cutting L : Light Cutting M : Medium Cutting R : Rough Cutting H : Heavy Cutting

Work Material	Hardness	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	
Austenitic Stainless Steel (X5CrNi189, X5CrNiMo1810)	≤200HB	●	F	1	FM	VP15TF	75–125	0.04–0.20	0.20–0.90
		●	F	2	Std	US735	70–135	0.08–0.30	0.30–2.00
		●	L	1	LM	MC7025	140–190	0.06–0.25	0.20–1.00
		●	L	2	Std	US735	70–135	0.08–0.30	0.30–2.00
		●	M	1	MM	MC7025	120–160	0.08–0.30	0.30–2.00
		●	F	1	FM	VP15TF	75–125	0.04–0.20	0.20–0.90
		●	F	2	Std	US735	70–135	0.08–0.30	0.30–2.00
		●	L	1	LM	MC7025	140–190	0.06–0.25	0.20–1.00
		●	L	2	Std	US735	70–135	0.08–0.30	0.30–2.00
		●	M	1	MM	MC7025	120–160	0.08–0.30	0.30–2.00
		⊕	F	1	FM	VP15TF	75–125	0.04–0.20	0.20–0.90
		⊕	F	2	Std	US735	70–135	0.08–0.30	0.30–2.00
		⊕	L	1	LM	MP7035	85–135	0.06–0.25	0.20–1.00
		⊕	L	2	LM	VP15TF	75–125	0.06–0.25	0.20–1.00
		⊕	L	3	Std	US735	70–135	0.08–0.30	0.30–2.00
		⊕	M	1	MM	MP7035	70–115	0.08–0.30	0.30–2.00
⊕	M	2	MM	VP15TF	60–105	0.08–0.30	0.30–2.00		
Austenitic Stainless Steel (X2CrNiN1810, X2CrNiMoN1813)	>200HB	●	F	1	FM	VP15TF	60–105	0.04–0.20	0.20–0.90
		●	F	2	Std	US735	60–110	0.08–0.30	0.30–2.00
		●	L	1	LM	MC7025	120–160	0.06–0.25	0.20–1.00
		●	L	2	Std	US735	60–110	0.08–0.30	0.30–2.00
		●	M	1	MM	MC7025	100–130	0.08–0.30	0.30–2.00
		●	F	1	FM	VP15TF	60–105	0.04–0.20	0.20–0.90
		●	F	2	Std	US735	60–110	0.08–0.30	0.30–2.00
		●	L	1	LM	MC7025	120–160	0.06–0.25	0.20–1.00
		●	L	2	Std	US735	60–110	0.08–0.30	0.30–2.00
		●	M	1	MM	MC7025	100–130	0.08–0.30	0.30–2.00
		⊕	F	1	FM	VP15TF	60–105	0.04–0.20	0.20–0.90
		⊕	F	2	Std	US735	60–110	0.08–0.30	0.30–2.00
		⊕	L	1	LM	MP7035	70–115	0.06–0.25	0.20–1.00
		⊕	L	2	LM	VP15TF	60–105	0.06–0.25	0.20–1.00
		⊕	L	3	Std	US735	60–110	0.08–0.30	0.30–2.00
		⊕	M	1	MM	MP7035	60–95	0.08–0.30	0.30–2.00
⊕	M	2	MM	VP15TF	50–90	0.08–0.30	0.30–2.00		
Two-phase Stainless Steel (X3CrNiCu1894)	≤280HB	●	F	1	FM	VP15TF	50–85	0.04–0.20	0.20–0.90
		●	F	2	Std	US735	45–90	0.08–0.30	0.30–2.00
		●	L	1	LM	MC7025	95–130	0.06–0.25	0.20–1.00
		●	L	2	Std	US735	45–90	0.08–0.30	0.30–2.00
		●	M	1	MM	MC7025	80–105	0.08–0.30	0.30–2.00
		●	F	1	FM	VP15TF	50–85	0.04–0.20	0.20–0.90
		●	F	2	Std	US735	45–90	0.08–0.30	0.30–2.00
		●	L	1	LM	MC7025	95–130	0.06–0.25	0.20–1.00
		●	L	2	Std	US735	45–90	0.08–0.30	0.30–2.00
		●	M	1	MM	MC7025	80–105	0.08–0.30	0.30–2.00
		⊕	F	1	FM	VP15TF	50–85	0.04–0.20	0.20–0.90
		⊕	F	2	Std	US735	45–90	0.08–0.30	0.30–2.00
		⊕	L	1	LM	MP7035	55–90	0.06–0.25	0.20–1.00
		⊕	L	2	LM	VP15TF	50–85	0.06–0.25	0.20–1.00

M

# TURNING INSERTS

## RECOMMENDED CUTTING CONDITIONS

### 7° POSITIVE INSERT TYPE

Breaker : Std : Standard Flat : Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
		Symbol	Area						
Two-phase Stainless Steel (X3CrNiCu1894)	≤280HB	✚	L	3	Std	US735	45-90	0.08-0.30	0.30-2.00
		✚	M	1	MM	MP7035	45-75	0.08-0.30	0.30-2.00
		✚	M	2	MM	VP15TF	40-70	0.08-0.30	0.30-2.00
Ferritic and Martensitic Stainless Steel (X10Cr13, X8Cr17)	≤200HB	●	F	1	FM	VP15TF	75-125	0.04-0.20	0.20-0.90
		●	F	2	Std	US735	70-135	0.08-0.30	0.30-2.00
		●	L	1	LM	MC7025	140-190	0.06-0.25	0.20-1.00
		●	L	2	Std	US735	70-135	0.08-0.30	0.30-2.00
		●	M	1	MM	MC7025	120-160	0.08-0.30	0.30-2.00
		●	F	1	FM	VP15TF	75-125	0.04-0.20	0.20-0.90
		●	F	2	Std	US735	70-135	0.08-0.30	0.30-2.00
		●	L	1	LM	MC7025	140-190	0.06-0.25	0.20-1.00
		●	L	2	Std	US735	70-135	0.08-0.30	0.30-2.00
		●	M	1	MM	MC7025	120-160	0.08-0.30	0.30-2.00
		✚	F	1	FM	VP15TF	75-125	0.04-0.20	0.20-0.90
		✚	F	2	Std	US735	70-135	0.08-0.30	0.30-2.00
		✚	L	1	LM	MP7035	85-135	0.06-0.25	0.20-1.00
		✚	L	2	LM	VP15TF	75-125	0.06-0.25	0.20-1.00
		✚	L	3	Std	US735	70-135	0.08-0.30	0.30-2.00
		Ferritic and Martensitic Stainless Steel (X17CrNi162, X30Cr13)	>200HB	●	F	1	FM	VP15TF	60-105
●	F			2	Std	US735	60-110	0.08-0.30	0.30-2.00
●	L			1	LM	MC7025	120-160	0.06-0.25	0.20-1.00
●	L			2	Std	US735	60-110	0.08-0.30	0.30-2.00
●	M			1	MM	MC7025	100-130	0.08-0.30	0.30-2.00
●	F			1	FM	VP15TF	60-105	0.04-0.20	0.20-0.90
●	F			2	Std	US735	60-110	0.08-0.30	0.30-2.00
●	L			1	LM	MC7025	120-160	0.06-0.25	0.20-1.00
●	L			2	Std	US735	60-110	0.08-0.30	0.30-2.00
●	M			1	MM	MC7025	100-130	0.08-0.30	0.30-2.00
✚	F			1	FM	VP15TF	60-105	0.04-0.20	0.20-0.90
✚	F			2	Std	US735	60-110	0.08-0.30	0.30-2.00
✚	L			1	LM	MP7035	70-115	0.06-0.25	0.20-1.00
✚	L			2	LM	VP15TF	60-105	0.06-0.25	0.20-1.00
✚	L			3	Std	US735	60-110	0.08-0.30	0.30-2.00
Hardened Stainless Steel (X5CrNiCuNb16-4, X7CrNiAl17-7)	<450HB			●	F	1	FM	VP15TF	40-70
		●	F	2	FS	MP9005	110-150	0.04-0.12	0.20-1.40
		●	F	3	Std	US735	40-75	0.08-0.25	0.30-2.00
		●	L	1	LM	MC7025	75-95	0.06-0.20	0.20-1.00
		●	L	2	LS(G)	MP9015	105-140	0.04-0.15	0.30-3.00
		●	L	3	LS(M)	MP9015	105-140	0.06-0.20	0.20-1.00
		●	L	4	Std	US735	40-75	0.08-0.25	0.30-2.00
		●	M	1	MM	MC7025	60-80	0.08-0.25	0.30-2.00
		●	M	2	MS	MP9015	85-120	0.08-0.25	0.30-2.00
		●	M	3	RCMT-Std	MP9015	85-120	0.25-0.45	1.50-3.00
		●	F	1	FM	VP15TF	40-70	0.04-0.20	0.20-0.90

CUTTING CONDITIONS : ● : Stable Cutting ● : General Cutting ✚ : Unstable Cutting

CUTTING AREA : F : Finish Cutting L : Light Cutting M : Medium Cutting R : Rough Cutting H : Heavy Cutting



Work Material	Hardness	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	
M Hardened Stainless Steel (X5CrNiCuNb16-4, X7CrNiAl17-7)	<450HB	●	F	2	FS	MP9015	105–140	0.04–0.12	0.20–1.40
		●	F	3	Std	US735	40–75	0.08–0.25	0.30–2.00
		●	L	1	LM	MC7025	75–95	0.06–0.20	0.20–1.00
		●	L	2	LS(G)	MP9015	105–140	0.04–0.15	0.30–3.00
		●	L	3	LS(M)	MP9015	105–140	0.06–0.20	0.20–1.00
		●	L	4	Std	US735	40–75	0.08–0.25	0.30–2.00
		●	M	1	MM	MC7025	60–80	0.08–0.25	0.30–2.00
		●	M	2	MS	MP9015	85–120	0.08–0.25	0.30–2.00
		●	M	3	RCMT-Std	MP9015	85–120	0.25–0.45	1.50–3.00
		⊕	F	1	FM	VP15TF	40–70	0.04–0.20	0.20–0.90
		⊕	F	2	Std	US735	40–75	0.08–0.25	0.30–2.00
		⊕	L	1	LM	MP7035	45–75	0.06–0.20	0.20–1.00
		⊕	L	2	LS(M)	MP9025	70–85	0.06–0.20	0.20–1.00
		⊕	L	3	LM	VP15TF	40–70	0.06–0.20	0.20–1.00
		⊕	L	4	Std	US735	40–75	0.08–0.25	0.30–2.00
		⊕	M	1	MM	MP7035	40–60	0.08–0.25	0.30–2.00
		⊕	M	2	MS	MP9025	60–70	0.08–0.25	0.30–2.00
		⊕	M	3	MM	VP15TF	35–60	0.08–0.25	0.30–2.00
		⊕	M	4	RCMT-Std	MP9025	60–70	0.25–0.45	1.50–3.00

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TURNING INSERTS

# TURNING INSERTS

## RECOMMENDED CUTTING CONDITIONS

### 7° POSITIVE INSERT TYPE

Breaker : Std : Standard Flat : Flat Top

Work Material	Tensile Strength	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
		●	F						
Gray Cast Iron (GG30)	≤350MPa	●	F	1	MK	MC5005	165-265	0.08-0.30	0.30-2.00
		●	L	1	MK	MC5005	165-265	0.08-0.30	0.30-2.00
		●	M	1	Flat	MC5005	165-265	0.08-0.30	0.30-2.00
		●	F	1	MK	MC5015	150-240	0.08-0.30	0.30-2.00
		●	L	1	MK	MC5015	150-240	0.08-0.30	0.30-2.00
		●	M	1	Flat	MC5015	150-240	0.08-0.30	0.30-2.00
		✚	F	1	MK	MC5015	150-240	0.08-0.30	0.30-2.00
		✚	L	1	MK	MC5015	150-240	0.08-0.30	0.30-2.00
		✚	M	1	Flat	MC5015	150-240	0.08-0.30	0.30-2.00
Ductile Cast Iron (GGG40)	≤450MPa	●	F	1	MK	MC5005	155-250	0.08-0.30	0.30-2.00
		●	L	1	MK	MC5005	155-250	0.08-0.30	0.30-2.00
		●	M	1	Flat	MC5005	155-250	0.08-0.30	0.30-2.00
		●	F	1	MK	MC5015	140-230	0.08-0.30	0.30-2.00
		●	L	1	MK	MC5015	140-230	0.08-0.30	0.30-2.00
		●	M	1	Flat	MC5015	140-230	0.08-0.30	0.30-2.00
		✚	F	1	MK	MC5015	140-230	0.08-0.30	0.30-2.00
		✚	L	1	MK	MC5015	140-230	0.08-0.30	0.30-2.00
		✚	M	1	Flat	MC5015	140-230	0.08-0.30	0.30-2.00
Ductile Cast Iron (GGG70)	≤800MPa	●	F	1	MK	MC5005	140-225	0.08-0.30	0.30-2.00
		●	L	1	MK	MC5005	140-225	0.08-0.30	0.30-2.00
		●	M	1	Flat	MC5005	140-225	0.08-0.30	0.30-2.00
		●	F	1	MK	MC5015	125-205	0.08-0.30	0.30-2.00
		●	L	1	MK	MC5015	125-205	0.08-0.30	0.30-2.00
		●	M	1	Flat	MC5015	125-205	0.08-0.30	0.30-2.00
		✚	F	1	MK	MC5015	125-205	0.08-0.30	0.30-2.00
		✚	L	1	MK	MC5015	125-205	0.08-0.30	0.30-2.00
		✚	M	1	Flat	MC5015	125-205	0.08-0.30	0.30-2.00

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TURNING INSERTS

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CUTTING CONDITIONS : ● : Stable Cutting ● : General Cutting ✚ : Unstable Cutting

CUTTING AREA : F : Finish Cutting L : Light Cutting M : Medium Cutting R : Rough Cutting H : Heavy Cutting

Work Material	Hardness	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)		
N	Aluminium Alloy (A6061, A7075)	●	F	1	AZ	HTi10	300–700	0.10–0.40	0.20–3.00	
		◐	F	1	AZ	HTi10	300–700	0.10–0.40	0.20–3.00	
		⊕	F	1	AZ	HTi10	300–700	0.10–0.40	0.20–3.00	
	Aluminium Alloy (AC4B)	5% ≤ Si ≤ 10%	●	F	1	AZ	HTi10	300–700	0.10–0.40	0.20–3.00
			◐	F	1	AZ	HTi10	300–700	0.10–0.40	0.20–3.00
			⊕	F	1	AZ	HTi10	300–700	0.10–0.40	0.20–3.00
	Aluminium Alloy (ADC12, A390)	Si > 10%	●	F	1	AZ	HTi10	300–700	0.10–0.40	0.20–3.00
			◐	F	1	AZ	HTi10	300–700	0.10–0.40	0.20–3.00
			⊕	F	1	AZ	HTi10	300–700	0.10–0.40	0.20–3.00

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TURNING INSERTS

# TURNING INSERTS

## RECOMMENDED CUTTING CONDITIONS

### 7° POSITIVE INSERT TYPE

Breaker : Std : Standard Flat : Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
		●	●						
Titanium Alloy (Ti-6Al-4V)	—	●	F	1	FS-P	MT9005	40-80	0.04-0.12	0.20-1.40
		●	F	2	FJ	RT9010	35-75	0.04-0.12	0.20-1.40
		●	L	1	LS-P	MT9005	40-80	0.04-0.15	0.30-3.00
		●	L	2	LS(M)	MT9005	40-80	0.06-0.20	0.20-1.00
		●	M	1	MS	MT9005	35-65	0.08-0.25	0.30-2.00
		●	M	2	RCMT-Std	MT9005	35-65	0.25-0.45	1.50-3.00
		●	F	1	FS-P	MT9005	40-80	0.04-0.12	0.20-1.40
		●	F	2	FJ	RT9010	35-75	0.04-0.12	0.20-1.40
		●	L	1	LS-P	MT9005	40-80	0.04-0.15	0.30-3.00
		●	L	2	LS(M)	MT9005	40-80	0.06-0.20	0.20-1.00
		●	M	1	MS	MT9005	35-65	0.08-0.25	0.30-2.00
		●	M	2	RCMT-Std	MT9005	35-65	0.25-0.45	1.50-3.00
		●	F	1	FS-P	MT9005	40-80	0.04-0.12	0.20-1.40
		●	F	2	FJ	RT9010	35-75	0.04-0.12	0.20-1.40
		●	L	1	LS-P	MT9005	40-80	0.04-0.15	0.30-3.00
		●	L	2	LS(M)	MT9005	40-80	0.06-0.20	0.20-1.00
		●	M	1	MS	MT9005	35-65	0.08-0.25	0.30-2.00
		●	M	2	RCMT-Std	MT9015	30-60	0.25-0.45	1.50-3.00
Heat Resistant Alloy (Inconel718)	—	●	F	1	FS	MP9005	25-95	0.04-0.12	0.20-1.40
		●	F	2	FJ	VP10RT	20-45	0.04-0.12	0.20-1.40
		●	L	1	LS(G)	MP9005	25-95	0.04-0.15	0.30-3.00
		●	L	2	LS(M)	MP9005	25-95	0.06-0.20	0.20-1.00
		●	M	1	MS	MP9005	20-80	0.08-0.25	0.30-2.00
		●	M	2	RCMT-Std	MP9005	20-80	0.25-0.45	1.50-3.00
		●	F	1	FS	MP9015	20-75	0.04-0.12	0.20-1.40
		●	F	2	FJ	VP10RT	20-45	0.04-0.12	0.20-1.40
		●	L	1	LS(G)	MP9015	20-75	0.04-0.15	0.30-3.00
		●	L	2	LS(M)	MP9015	20-75	0.06-0.20	0.20-1.00
		●	M	1	MS	MP9015	20-60	0.08-0.25	0.30-2.00
		●	M	2	RCMT-Std	MP9015	20-60	0.25-0.45	1.50-3.00
		●	F	1	FJ	VP10RT	20-45	0.04-0.12	0.20-1.40
		●	L	1	LS(M)	MP9025	15-25	0.06-0.20	0.20-1.00
		●	M	1	MS	MP9025	15-20	0.08-0.25	0.30-2.00
		●	M	2	RCMT-Std	MP9025	15-20	0.25-0.45	1.50-3.00

CUTTING CONDITIONS : ● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting

CUTTING AREA : F : Finish Cutting L : Light Cutting M : Medium Cutting R : Rough Cutting H : Heavy Cutting

11° POSITIVE INSERT TYPE

Work Material	Hardness	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	
Mild Steel (St37-2, Ck10)	≤180HB	●	F	1	R-R/L	NX2525	225-320	0.05-0.12	0.20-0.60
		●	L	1	R-Std	NX2525	185-270	0.08-0.30	0.30-2.00
		●	M	1	R-Std	NX2525	185-270	0.08-0.30	0.30-2.00
		●	F	1	R-R/L	NX2525	225-320	0.05-0.12	0.20-0.60
		●	L	1	R-Std	UE6110	210-355	0.08-0.30	0.30-2.00
		●	L	2	R-Std	MP3025	190-295	0.08-0.30	0.30-2.00
		●	L	3	R-Std	NX3035	180-255	0.08-0.30	0.30-2.00
		●	M	1	R-Std	UE6110	210-355	0.08-0.30	0.30-2.00
		●	M	2	R-Std	MP3025	190-295	0.08-0.30	0.30-2.00
		●	M	3	R-Std	NX3035	180-255	0.08-0.30	0.30-2.00
		⊕	F	1	R-R/L	UTi20T	115-165	0.05-0.12	0.20-0.60
		⊕	L	1	N-Flat	UP20M	105-160	0.08-0.30	0.30-2.00
		⊕	M	1	N-Flat	UP20M	105-160	0.08-0.30	0.30-2.00
		Carbon Steel • Alloy Steel (Ck45, 42CrMo4)	180   280HB	●	F	1	R-R/L	NX2525	165-240
●	L			1	R-Std	NX2525	140-200	0.08-0.30	0.30-2.00
●	M			1	R-Std	NX2525	140-200	0.08-0.30	0.30-2.00
●	F			1	R-R/L	NX2525	165-240	0.05-0.12	0.20-0.60
●	L			1	R-Std	UE6110	155-260	0.08-0.30	0.30-2.00
●	L			2	R-Std	MP3025	140-220	0.08-0.30	0.30-2.00
●	L			3	R-Std	NX3035	135-190	0.08-0.30	0.30-2.00
●	M			1	R-Std	UE6110	155-260	0.08-0.30	0.30-2.00
●	M			2	R-Std	MP3025	140-220	0.08-0.30	0.30-2.00
●	M			3	R-Std	NX3035	135-190	0.08-0.30	0.30-2.00
⊕	F			1	R-R/L	UTi20T	85-120	0.05-0.12	0.20-0.60
⊕	L			1	N-Flat	UP20M	80-120	0.08-0.30	0.30-2.00
⊕	M			1	N-Flat	UP20M	80-120	0.08-0.30	0.30-2.00

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TURNING INSERTS

# TURNING INSERTS

## RECOMMENDED CUTTING CONDITIONS

■ 11° POSITIVE INSERT TYPE

Breaker : Std : Standard Flat : Flat Top

Work Material	Tensile Strength	Cutting Mode	Priority	Breaker	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	
Gray Cast Iron (GG30)	≤350MPa	●	F	1	R-R/L	NX2525	145-200	0.05-0.12	0.20-0.60
		●	L	1	N-Flat	MC5005	165-265	0.08-0.30	0.30-2.00
		●	L	2	N-Flat	NX2525	120-165	0.08-0.30	0.30-2.00
		●	L	3	R-Std	NX2525	120-165	0.08-0.30	0.30-2.00
		●	M	1	N-Flat	MC5005	165-265	0.08-0.30	0.30-2.00
		●	M	2	N-Flat	NX2525	120-165	0.08-0.30	0.30-2.00
		●	M	3	R-Std	NX2525	120-165	0.08-0.30	0.30-2.00
		●	F	1	R-R/L	NX2525	145-200	0.05-0.12	0.20-0.60
		●	F	2	R-R/L	HTi10	100-140	0.05-0.12	0.20-0.60
		●	L	1	N-Flat	MC5015	150-240	0.08-0.30	0.30-2.00
		●	L	2	N-Flat	UE6110	125-200	0.08-0.30	0.30-2.00
		●	M	1	N-Flat	MC5015	150-240	0.08-0.30	0.30-2.00
		●	M	2	N-Flat	UE6110	125-200	0.08-0.30	0.30-2.00
		✦	F	1	R-R/L	UTi20T	80-115	0.05-0.12	0.20-0.60
		✦	L	1	N-Flat	VP15TF	115-160	0.08-0.30	0.30-2.00
✦	M	1	N-Flat	VP15TF	115-160	0.08-0.30	0.30-2.00		
Ductile Cast Iron (GGG40)	≤450MPa	●	F	1	R-R/L	NX2525	140-190	0.05-0.12	0.20-0.60
		●	L	1	N-Flat	MC5005	155-250	0.08-0.30	0.30-2.00
		●	L	2	N-Flat	NX2525	115-155	0.08-0.30	0.30-2.00
		●	L	3	R-Std	NX2525	115-155	0.08-0.30	0.30-2.00
		●	M	1	N-Flat	MC5005	155-250	0.08-0.30	0.30-2.00
		●	M	2	N-Flat	NX2525	115-155	0.08-0.30	0.30-2.00
		●	M	3	R-Std	NX2525	115-155	0.08-0.30	0.30-2.00
		●	F	1	R-R/L	NX2525	140-190	0.05-0.12	0.20-0.60
		●	F	2	R-R/L	HTi10	95-135	0.05-0.12	0.20-0.60
		●	L	1	N-Flat	MC5015	140-230	0.08-0.30	0.30-2.00
		●	L	2	N-Flat	UE6110	120-190	0.08-0.30	0.30-2.00
		●	M	1	N-Flat	MC5015	140-230	0.08-0.30	0.30-2.00
		●	M	2	N-Flat	UE6110	120-190	0.08-0.30	0.30-2.00
		✦	F	1	R-R/L	UTi20T	75-105	0.05-0.12	0.20-0.60
		✦	L	1	N-Flat	VP15TF	110-150	0.08-0.30	0.30-2.00
✦	M	1	N-Flat	VP15TF	110-150	0.08-0.30	0.30-2.00		
Ductile Cast Iron (GGG70)	≤800MPa	●	F	1	R-R/L	NX2525	125-170	0.05-0.12	0.20-0.60
		●	L	1	N-Flat	MC5005	140-225	0.08-0.30	0.30-2.00
		●	L	2	N-Flat	NX2525	105-140	0.08-0.30	0.30-2.00
		●	L	3	R-Std	NX2525	105-140	0.08-0.30	0.30-2.00
		●	M	1	N-Flat	MC5005	140-225	0.08-0.30	0.30-2.00
		●	M	2	N-Flat	NX2525	105-140	0.08-0.30	0.30-2.00
		●	M	3	R-Std	NX2525	105-140	0.08-0.30	0.30-2.00
		●	F	1	R-R/L	NX2525	125-170	0.05-0.12	0.20-0.60
		●	F	2	R-R/L	HTi10	85-120	0.05-0.12	0.20-0.60
		●	L	1	N-Flat	MC5015	125-205	0.08-0.30	0.30-2.00
		●	L	2	N-Flat	UE6110	105-170	0.08-0.30	0.30-2.00
		●	M	1	N-Flat	MC5015	125-205	0.08-0.30	0.30-2.00
		●	M	2	N-Flat	UE6110	105-170	0.08-0.30	0.30-2.00
		✦	F	1	R-R/L	UTi20T	65-95	0.05-0.12	0.20-0.60
		✦	L	1	N-Flat	VP15TF	95-135	0.08-0.30	0.30-2.00
✦	M	1	N-Flat	VP15TF	95-135	0.08-0.30	0.30-2.00		

CUTTING CONDITIONS : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

CUTTING AREA : F : Finish Cutting L : Light Cutting M : Medium Cutting R : Rough Cutting H : Heavy Cutting

# Memo

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A series of horizontal dashed lines for writing.

# TURNING INSERTS [NEGATIVE]

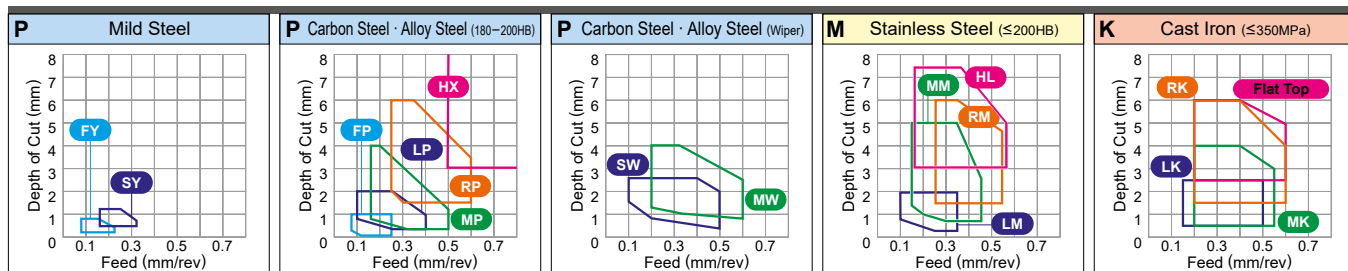
## 80° CN TYPE INSERTS WITH HOLE

### CNMG 12 04 02- FP

Size Thickness Corner Radius Chipbreaker  
\* Please refer to page A002.

#### CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting..... Light Cutting..... Medium Cutting..... Rough Cutting..... Heavy Cutting.....



Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

Work Material	Shape	Order Number	RE (mm)	Coated														Cermet	Coated Cermets	Carbide	Applicable Holder / Page																
				UE6105	UE6110	UE6020	MC6115 NEW	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	US905					MC5005	MC5015	MH515 NEW	MP9005	MP9015	MP9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UT120T
P Steel	FP	CNMG120402-FP	0.2																																		C008
		CNMG120404-FP	0.4																																		C009
		CNMG120408-FP	0.8																																		E015
		CNMG120412-FP	1.2																																		E038
M Stainless Steel (≤200HB)	FH	CNMG120402-FH	0.2	★																							★	★							C008		
		CNMG120404-FH	0.4	●																							●	●	★							C009	
		CNMG120408-FH	0.8	●																							●	●								E015	
		CNMG120412-FH	1.2																								●	★								E038	
K Cast Iron (≤350MPa)	FS	CNMG120404-FS	0.4																							●									C008		
		CNMG120408-FS	0.8																							●									C009		
P Mild Steel	FY	CNMG120404-FY	0.4	●																							●	★	●							C008	
		CNMG120408-FY	0.8	●																							●	★	●							C009	
																																				E015	
																																					E038
P Carbon Steel - Alloy Steel (180-200HB)	FJ	CNGG1204V5-FJ	0.05																																C008		
		CNGG120401-FJ	0.1																																	C009	
		CNGG120402-FJ	0.2																																		E015
		CNGG120404-FJ	0.4																																		E038
P Carbon Steel - Alloy Steel (Wiper)	LP	CNMG120404-LP	0.4	●●	●●	●●	●●																				●									C008	
		CNMG120408-LP	0.8	●●	●●	●●	●●																				●									C009	
		CNMG120412-LP	1.2	●★	●●	●●	●●																														E015
																																					E038
M Stainless Steel (≤200HB)	LM	CNMG120404-LM	0.4																																	C008	
		CNMG120408-LM	0.8																																	C009	
		CNMG120412-LM	1.2																																		E015
																																					E038

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.

□ : Non stock, produced to order only.

A

TURNING INSERTS

NEG

WITH HOLE

C

D

R

S









T

V

W



Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting

Work Material	P	Steel	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	Applicable Holder Page															
	M	Stainless Steel	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●	●●●●●●●●●●●●																
Shape	Order Number	RE (mm)	Coated															Cermet	Coated Cermet	Carbide																
			UE6105	UE6110	UE6020	MC6115 NEW	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	US905	MC5005	MC5015	MH515 NEW	MP9005	MP9015	MP9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UT120T	HT110	RT9010	MT9015	
 Light Cutting	CNMG120404-LK	0.4														●	●																			
	CNMG120408-LK	0.8														●	●	★																		
	CNMG120412-LK	1.2														●	●	★																		
 Light Cutting	CNMG090304-LS	0.4																●	●	●																
	CNMG090308-LS	0.8																●	●	●																
	CNMG120402-LS	0.2																●	●	●																●
	CNMG120404-LS	0.4																●	●	●																●
	CNMG120408-LS	0.8																●	●	●																●
 Light Cutting	CNMG09T304-SH	0.4	●													●																				
	CNMG09T308-SH	0.8	●													●																				
	CNMG09T312-SH	1.2																	□																	
	CNMG120404-SH	0.4	★●	★	★	★	★									●										●★		★								
	CNMG120408-SH	0.8	●●	★	★	★	★								●											●★		★								
	CNMG120412-SH	1.2	●★	★	★	★	★												□																	
 Light Cutting	CNMG120404-SA	0.4	●●	★	★	★	★																		★★											
	CNMG120408-SA	0.8	●●	★	★	●	★																		★★											
	CNMG120412-SA	1.2	●●	★	★	★	★																			★										
*  Light Cutting (Wiper)	CNMG120404-SW	0.4	●●	●	★	●									★●										●★	★										
	CNMG120408-SW	0.8	●●	●	★	●									★●										●★	●										
	CNMG120412-SW	1.2	●●	●	★	●																			●★	★										
 Light Cutting	CNMG120404-SY	0.4		★																					●	★	●									
	CNMG120408-SY	0.8		●																					●	★	●									
 Light Cutting	CNMG120404-MJ	0.4													●			●	●																●	
	CNMG120408-MJ	0.8													●			●	●																●	
	CNMG120412-MJ	1.2													●			●	●																●	
	CNMG120416-MJ	1.6													●			●	●	★	●														●	
 Light Cutting	CNGG120404-MJ	0.4																							●●										●●	
	CNGG120408-MJ	0.8																								●●									●●	

\* Please refer to page A028 before using the SW breaker (wiper insert).

● = NEW

# TURNING INSERTS [NEGATIVE]



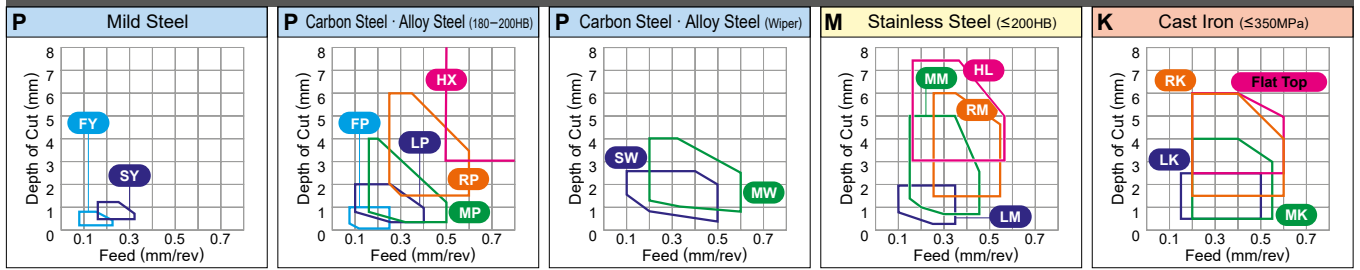
## 80° CN TYPE INSERTS WITH HOLE

**CNMG 12 04 04- MP**

 Size Thickness Corner Radius Chipbreaker  
 \* Please refer to page A002.

**CHIP CONTROL RANGE FOR WORK MATERIALS**

Finish Cutting..... Light Cutting..... Medium Cutting..... Rough Cutting..... Heavy Cutting.....


**Cutting Conditions (Guide) :** ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

Work Material	P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	S Heat-resistant Alloy, Titanium Alloy	Coated																Cermet	Coated Cermet	Carbide	Applicable Holder / Page													
						UE6105	UE6110	UE6020	NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	US905	MC5005					MC5015	NEW MH515	MP9005	NEW MP9015	NEW MP9025	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N
<b>MP</b> 	<b>CNMG120404-MP</b>	0.4	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●																							
	<b>CNMG120408-MP</b>	0.8	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●													★									C008	
	<b>CNMG120412-MP</b>	1.2	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●																							C009
	<b>CNMG120416-MP</b>	1.6	★	★	★	★	★	★	★	★	★	★	★	★	★																							E015
	<b>CNMG160608-MP</b>	0.8	★	●	★	●	●	●	●	●	●	●	●	●	●																						E038	
	<b>CNMG160612-MP</b>	1.2	●	●	★	●	●	●	●	●	●	●	●	●	●																						H006	
	<b>CNMG160616-MP</b>	1.6	●	★	★	●	●	●	●	●	●	●	●	●	●																					-008		
<b>MM</b> 	<b>CNMG120408-MM</b>	0.8									●●	●●	●●																								C008	
	<b>CNMG120412-MM</b>	1.2									●●	●●	●●																								C009	
	<b>CNMG120416-MM</b>	1.6									●●	●●	●●																								E015	
	<b>CNMG160608-MM</b>	0.8									●●	●●	●●																								E038	
	<b>CNMG160612-MM</b>	1.2									●●	●●	●●																								H006	
	<b>CNMG160616-MM</b>	1.6									●●	●●	●●																								-008	
	<b>CNMG190608-MM</b>	0.8									●●	●●	●●																									
<b>MK</b> 	<b>CNMG120404-MK</b>	0.4																			●●																C008	
	<b>CNMG120408-MK</b>	0.8																			●●																C009	
	<b>CNMG120412-MK</b>	1.2																			●●																E015	
	<b>CNMG120416-MK</b>	1.6																			★	●															E038	
	<b>CNMG160608-MK</b>	0.8																			★	●															H006	
	<b>CNMG160612-MK</b>	1.2																			●	●															-008	
	<b>CNMG160616-MK</b>	1.6																			●	●																
<b>* MS</b> 	<b>CNMG090304-MS</b>	0.4																			●●	●●															C008	
	<b>CNMG090308-MS</b>	0.8																			●●	●●															C009	
	<b>CNMG120404-MS</b>	0.4																			●	●															E015	
	<b>CNMG120408-MS</b>	0.8																			●	●															E038	
	<b>CNMG120412-MS</b>	1.2																			●	●															H006	
	<b>CNMG160612-MS</b>	1.2																			★	●															-008	
	<b>CNMG160616-MS</b>	1.6																			★	★																

\*Newly designed breakers : MP9005, MP9015, MP9025, MT9015

● = NEW

 ● : Inventory maintained. ★ : Inventory maintained in Japan.  
 □ : Non stock, produced to order only.



# TURNING INSERTS [NEGATIVE]

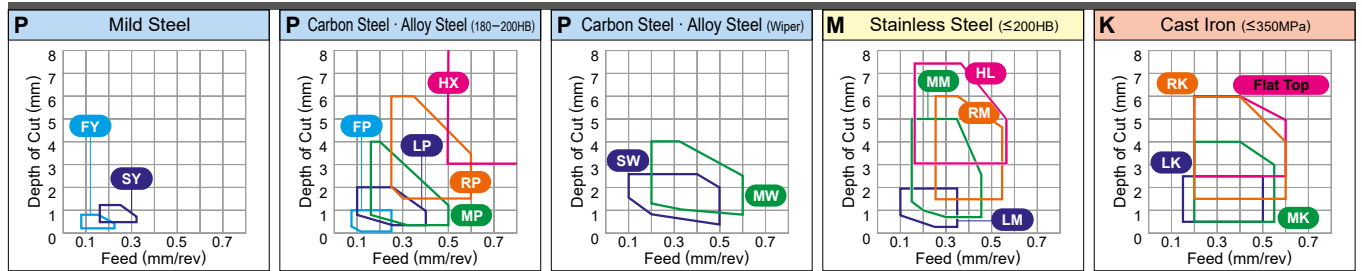
## 80° CN TYPE INSERTS WITH HOLE

CNMG 09 03 08

Size Thickness Corner Radius  
\* Please refer to page A002.

### CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting..... Light Cutting..... Medium Cutting..... Rough Cutting..... Heavy Cutting.....



Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ☆ : Unstable Cutting

Work Material	P	Steel	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																			
	M	Stainless Steel	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																			
Work Material	K	Cast Iron	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																			
	N	Non-ferrous Metal	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																			
Work Material	S	Heat-resistant Alloy, Titanium Alloy	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																			
	Shape	Order Number	RE (mm)	Coated Cermet Coated Cermet Carbide															Applicable Holder Page			
Standard		CNMG090308	0.8	★																		
		CNMG09T304	0.4	●																		
		CNMG09T308	0.8	●																		
		CNMG120404	0.4	● ●	● ●																	
		CNMG120408	0.8	● ●	● ●	● ●																C008
		CNMG120412	1.2	● ●	● ●	● ●	● ●															C009
		CNMG120416	1.6	★ ★	● ●	● ●	● ●															E015
		CNMG160608	0.8	● ★	● ●	● ●	● ●															E038
		CNMG160612	1.2	★ ●	● ●	● ●	● ●															H006
		CNMG160616	1.6	★ ★	● ●	● ●	● ●															—008
		CNMG190608	0.8	★ ●	● ●	● ●	● ●															
		CNMG190612	1.2	★ ★	● ●	● ●	● ●															
		Medium Cutting	CNMG190616	1.6	● ★	● ●	● ●															
* MW		CNMG120408-MW	0.8	● ●	● ●	● ●					● ●									C008		
		CNMG120412-MW	1.2	● ●	● ●	● ●					● ●									C009		
RP		CNMG120408-RP	0.8	● ●	● ●	● ●														C008		
		CNMG120412-RP	1.2	● ●	● ●	● ●														C009		
		CNMG120416-RP	1.6	★ ★	● ●	● ●	● ●														E015	
		CNMG160612-RP	1.2	● ★	● ●	● ●	● ●														E038	
		CNMG160616-RP	1.6	● ★	● ●	● ●	● ●														H006	
		CNMG190612-RP	1.2	★ ★	● ●	● ●	● ●														—008	
Rough Cutting	CNMG190616-RP	1.6	★ ●	● ●	● ●																	
RM		CNMG120408-RM	0.8				● ● ●													C008		
		CNMG120412-RM	1.2				● ● ●													C009		
		CNMG120416-RM	1.6				● ● ●													E015		
		CNMG160612-RM	1.2				● ● ●													E038		
		CNMG160616-RM	1.6				● ● ●													H006		
		CNMG190612-RM	1.2				● ● ●													—008		
Rough Cutting	CNMG190616-RM	1.6				● ● ●																

\* Please refer to page A028 before using the MW breaker (wiper insert).

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.

□ : Non stock, produced to order only.

















# TURNING INSERTS [NEGATIVE]

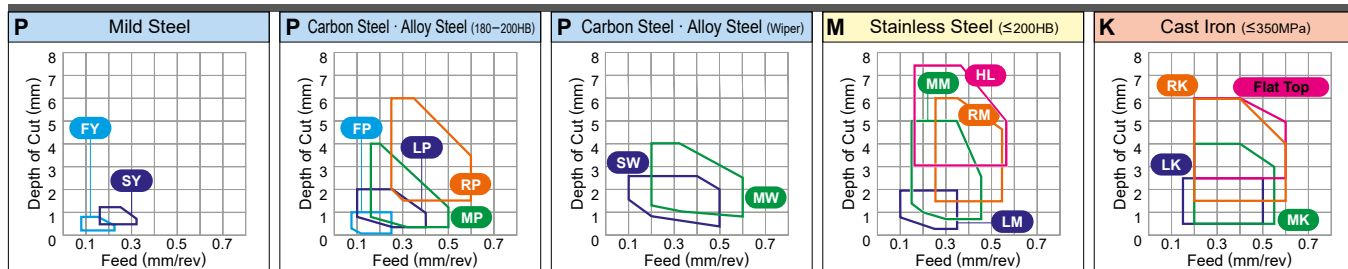
## 55° DN TYPE INSERTS WITH HOLE

### DNMG 15 04 08- RM

Size Thickness Corner Radius Chipbreaker  
\* Please refer to page A002.

#### CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting..... Light Cutting..... Medium Cutting..... Rough Cutting..... Heavy Cutting.....



Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

Work Material	P Steel		M Stainless Steel		K Cast Iron		N Non-ferrous Metal		S Heat-resistant Alloy, Titanium Alloy																																	
	Coated										Cermet	Coated Cermet	Carbide		Applicable Holder Page																											
	Shape	Order Number	RE (mm)	UE6105	UE6110	UE6020	MC6115 NEW	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025		MP7035	US735	US905	MC5005	MC5015	MH515 NEW	MP9005	MP9015	MP9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UT120T	HT110	RT9010	MT9015					
RM	DNMG150408-RM	0.8											●●●																													
	DNMG150412-RM	1.2											★●●																													C011
	DNMG150416-RM	1.6											★★★																													E015
Rough Cutting	DNMG150608-RM	0.8											★★●																												E038	
	DNMG150612-RM	1.2											★★★																												-040	
	DNMG150616-RM	1.6											★★★																												H009	
	DNMG150616-RM	1.6											★★★																												-011	
RK	DNMG150408-RK	0.8																●●																							C010	
	DNMG150412-RK	1.2																●●																							C011	
Rough Cutting	DNMG150608-RK	0.8																●●																								E015
	DNMG150612-RK	1.2																●●																							E038	
	DNMG150612-RK	1.2																●●																							-040	
	DNMG150612-RK	1.2																●●																							H009	
	DNMG150612-RK	1.2																●●																							-011	
RS	DNMG150408-RS	0.8																						●●																	●	C010
	DNMG150412-RS	1.2																						●●																	●	C011
Rough Cutting	DNMG150608-RS	0.8																						●●																	★	E015
	DNMG150612-RS	1.2																						●●																●	E038	
	DNMG150616-RS	1.6																						●●																●	-040	
	DNMG150616-RS	1.6																						●●																★	H009	
	DNMG150616-RS	1.6																						●●																★	-011	
GH	DNMG150408-GH	0.8	★●	★●										●																											C010	
	DNMG150412-GH	1.2	★●	★★									★																												C011	
Rough Cutting	DNMG150608-GH	0.8	●●	★●									●																												E015	
	DNMG150612-GH	1.2	●●	★●									●																											E038		
	DNMG150612-GH	1.2	●●	★●									●																												-040	
	DNMG150612-GH	1.2	●●	★●									●																												H009	
	DNMG150612-GH	1.2	●●	★●									●																												-011	
GJ	DNMG150408-GJ	0.8											★											●●																	C010	
	DNMG150412-GJ	1.2											★											★●																	C011	
Rough Cutting	DNMG150608-GJ	0.8											★											★★																	E015	
	DNMG150612-GJ	1.2											★											●●																	E038	
	DNMG150616-GJ	1.6											★											●																	-040	
	DNMG150612-GJ	1.2											★											★																	H009	
	DNMG150616-GJ	1.6											★											●																	-011	
HL	DNMM150408-HL	0.8										★★			★																										C010	
	DNMM150412-HL	1.2										★★			★																										C011	
Heavy Cutting	DNMM150608-HL	0.8	●										●●		●																										E015	
	DNMM150612-HL	1.2	●										●●		●																										E038	
	DNMM150612-HL	1.2	●										●●		●																										-040	
	DNMM150612-HL	1.2	●										●●		●																										H009	
	DNMM150612-HL	1.2	●										●●		●																										-011	

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.  
□ : Non stock, produced to order only.

TURNING INSERTS

NEG WITH HOLE

C

D

R




S

T

V

W

Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting

Work Material	P	Steel	● ● ✱ ✱ ✱ ✱ ✱ ✱ ✱ ●							✱ ✱ ✱ ✱ ● ● ● ●																														
	M	Stainless Steel						● ● ● ● ●																																
K	N	S	Cast Iron							● ● ● ● ●																														
			Non-ferrous Metal																																					
			Heat-resistant Alloy, Titanium Alloy																																					
Shape	Order Number	RE (mm)	Coated														Cermet	Coated Cermet	Carbide	Applicable Holder Page																				
			UE6105	UE6110	UE6020	<b>MC6115</b> NEW	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	US905	MC5005	MC5015		<b>MH515</b> NEW	MP9005	MP9015	<b>MP9025</b> NEW	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi10	RT9010	MT9015			
<b>HZ</b>  Heavy Cutting	DNMM150408-HZ	0.8																																						C010 C011 E015 E038 -040 H009 -011
	DNMM150412-HZ	1.2																																						
	DNMM150608-HZ	0.8	✱																																					
	DNMM150612-HZ	1.2	✱																																					
<b>Flat Top</b> 	DNMA150404	0.4														● ●																						C010 C011 E015 E038 -040 H009 -011		
	DNMA150408	0.8														● ●											✱													
	DNMA150412	1.2														● ●																								
	DNMA150604	0.4														● ●																								
	DNMA150608	0.8														● ●																								
<b>Flat Top</b> 	DNGA150404	0.4																																					C010 C011 E015 E038 -040 H009 -011	
	DNGA150408	0.8																																						
	DNGA150604	0.4																																						
	DNGA150608	0.8																																						

● = NEW

A

TURNING INSERTS

NEG

WITH HOLE

C

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V

W

CHIPBREAKERS > A042  
 GRADES > A030  
 IDENTIFICATION > A002

A111


# TURNING INSERTS [NEGATIVE]

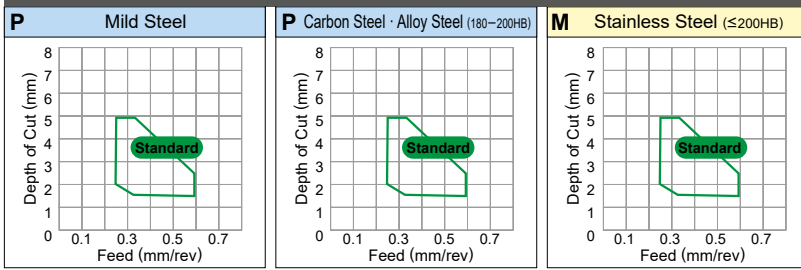
## RN TYPE INSERTS WITH HOLE

**RNMG 12 04 00**

Size Thickness Corner Radius  
\* Please refer to page A002.

### CHIP CONTROL RANGE FOR WORK MATERIALS


Medium Cutting..... 



A

TURNING INSERTS

Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

Work Material	P	Steel	● ●																																			
	M	Stainless Steel	● ● ● ● ● ● ● ● ● ● ● ●										● ● ● ● ● ● ● ● ● ● ● ●						● ● ● ● ● ● ● ● ● ● ● ●																			
Shape	Order Number	IC (mm)	Coated																				Cermet	Coated Cermet		Carbide			Applicable Holder Page									
			UE6105	UE6110	UE6020	MC6115 <span style="background-color: yellow;">NEW</span>	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	US905	MC5005	MC5015	MH515 <span style="background-color: yellow;">NEW</span>	MP9005	MP9015	MP9025 <span style="background-color: yellow;">NEW</span>		VP05RT	VP10RT	VP15TF	UP20M	NX2525		NX3035	MP3025	AP25N	VP25N	UTi20T	HTi10	RT9010	MT9015	-
			Standard	RNMG120400	12.7	★	★ ●																															
																																						

 = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.

NEG

WITH HOLE

C

D

R

S

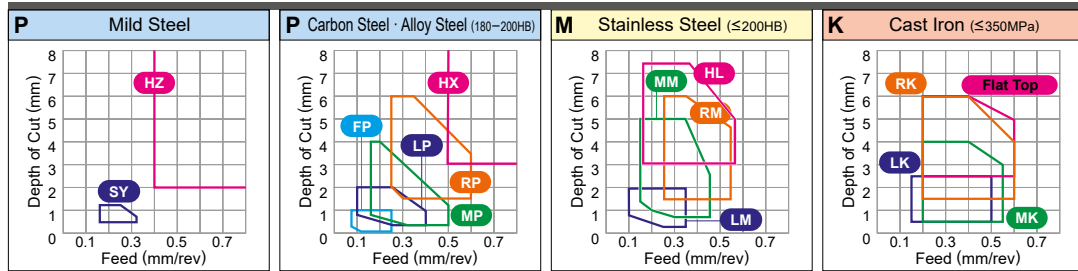
T

V

W

**CHIP CONTROL RANGE FOR WORK MATERIALS**

Finish Cutting..... Light Cutting..... Medium Cutting..... Rough Cutting..... Heavy Cutting.....



Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✚ : Unstable Cutting

Work Material	Order Number		RE (mm)	Coated															Cermets	Coated Cermets		Carbides			Applicable Holder Page																		
	P Steel	M Stainless Steel		K Cast Iron	N Non-ferrous Metal	S Heat-resistant Alloy, Titanium Alloy	UE6105	UE6110	UE6020	MC6115 NEW	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035		US735	US905	MC5005	MC5015	MH515 NEW		MP9005	MP9015	MP9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UT120T	HT110	RT9010	MT9015		
FP 	SNMG120404-FP	0.4																																									
	SNMG120408-FP	0.8		●●																																						C012 -015 E016 E037	
	SNMG120412-FP	1.2		●●																																							
FH 	SNMG090304-FH	0.4																																									
	SNMG090308-FH	0.8																																									
	SNMG120404-FH	0.4	★																																								
	SNMG120408-FH	0.8	★																																								
FS 	SNMG120408-FS	0.8																																									
LP 	SNMG120404-LP	0.4	★★		●●●●●																																						
	SNMG120408-LP	0.8	★★		●●●●●																																						
	SNMG120412-LP	1.2	★★		●●●●●																																						
LM 	SNMG120404-LM	0.4												●●●																													
	SNMG120408-LM	0.8												●●●																													
LK 	SNMG120408-LK	0.8																				●●																					
	SNMG120412-LK	1.2																				●●																					
SH 	SNMG120404-SH	0.4	★																																								
	SNMG120408-SH	0.8	●●	★●																																							
	SNMG120412-SH	1.2	★																																								

● = NEW

A

TURNING INSERTS

NEG

WITH HOLE

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# TURNING INSERTS [NEGATIVE]

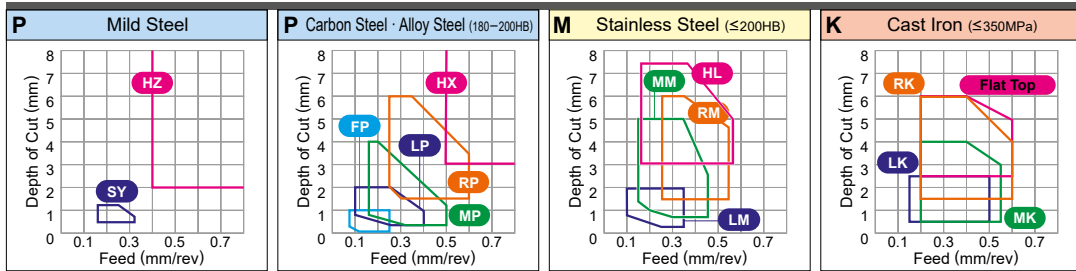
## 90° SN TYPE INSERTS WITH HOLE

### SNMG 12 04 04- SA

Size Thickness Corner Radius Chipbreaker  
\* Please refer to page A002.

#### CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting..... Light Cutting..... Medium Cutting..... Rough Cutting..... Heavy Cutting.....



Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✪ : Unstable Cutting

Work Material	Shape	Order Number	RE (mm)	Coated															Cermet	Coated Cermet	Carbide	Applicable Holder Page																		
				UE6105	UE6110	UE6020	NEW MC6115	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	US905	MC5005					MC5015	NEW MH515	MP9005	NEW MP9015	NEW MP9025	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UT120T	HT110	RT9010	MT9015
				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
P Steel	SA	SNMG120404-SA	0.4	●																																				
M Stainless Steel	SA	SNMG120408-SA	0.8	●	●																																			
K Cast Iron	SA	SNMG120412-SA	1.2	●																																				
N Non-ferrous Metal	SY	SNMG120408-SY	0.8	●																																				
S Heat-resistant Alloy, Titanium Alloy	MP	SNMG120404-MP	0.4	●	●	●	●	●																																
	MP	SNMG120408-MP	0.8	●	●	●	●	●																																
	MP	SNMG120412-MP	1.2	●	●	●	●	●																																
	MM	SNMG120408-MM	0.8						●	●	●																													
	MM	SNMG120412-MM	1.2						●	●	●																													
	MM	SNMG120416-MM	1.6						●	●	●																													
	MM	SNMG150608-MM	0.8						●	●	●																													
	MM	SNMG150612-MM	1.2						●	●	●																													
	MM	SNMG150616-MM	1.6						●	●	●																													
	MM	SNMG190612-MM	1.2						●	●	●																													
	MM	SNMG190616-MM	1.6						●	●	●																													
	MK	SNMG120408-MK	0.8									●	●																											
	MK	SNMG120412-MK	1.2									●	●																											
	MK	SNMG150612-MK	1.2									●	●																											
	MK	SNMG150616-MK	1.6									●	●																											
	MK	SNMG190612-MK	1.2									●	●																											
	MK	SNMG190616-MK	1.6									●	●																											
	* MS	SNMG120404-MS	0.4																		●	●	●																	
	* MS	SNMG120408-MS	0.8																		●	●	●																	
	* MS	SNMG120412-MS	1.2																		●	●	●																	
	* MS	SNMG150612-MS	1.2																		●	●	●																	
	* MS	SNMG150616-MS	1.6																		●	●	●																	
	* MS	SNMG190612-MS	1.2																		●	●	●																	

\*Newly designed breakers : MP9005, MP9015, MP9025, MT9015

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.

□ : Non stock, produced to order only.





# TURNING INSERTS [NEGATIVE]

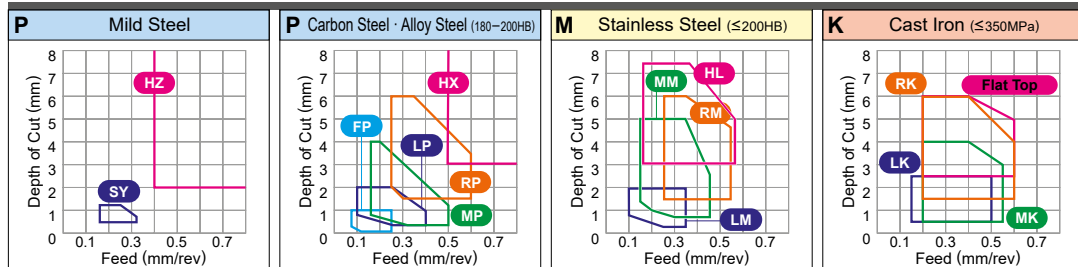


**SNGG 09 03 04 R**

Size Thickness Corner Radius R/L  
\* Please refer to page A002.

## CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting..... Light Cutting..... Medium Cutting..... Rough Cutting..... Heavy Cutting.....



Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

Work Material	P Steel		M Stainless Steel		K Cast Iron		N Non-ferrous Metal		S Heat-resistant Alloy, Titanium Alloy		Coated	Cermets	Coated Cermets	Carbide	Applicable Holder Page																																			
	● ● ✦	● ● ✦	● ● ✦	● ● ✦	● ● ✦	● ● ✦	● ● ✦	● ● ✦	● ● ✦	● ● ✦																																								
Shape	Order Number	RE (mm)											UE6105	UE6110	UE6020	MC6115 NEW	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	US905	MC5005	MC5015	MH515 NEW	MP9005	MP9015	MP9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UT120T	HT110	RT9010	MT9015					
	R/L	SNGG090304R	0.4												★ ●																																			
	SNGG090304L	0.4													★ ★																																			
	SNGG090308R	0.8													★ ★																																			
	SNGG090308L	0.8													★ ★																																			
Medium Cutting	SNGG120404R	0.4													★ ★ ●																																			
	SNGG120404L	0.4													★ ★ ★																																			
	SNGG120408R	0.8													★ ★ ★																																			
	SNGG120408L	0.8													★ ★ ★																																			
Rough Cutting	RP	SNMG120408-RP	0.8	★ ★	● ● ● ●																																													
		SNMG120412-RP	1.2	★ ●	● ● ● ●																																													
		SNMG120416-RP	1.6	★ ★	● ● ● ●																																													
		SNMG150612-RP	1.2	★ ★	● ● ● ●																																													
		SNMG150616-RP	1.6	● ★	● ● ● ●																																													
		SNMG190612-RP	1.2	★ ★	● ● ● ●																																													
	SNMG190616-RP	1.6	★ ●	● ● ● ●																																														
Rough Cutting	RM	SNMG120408-RM	0.8							★ ● ●																																								
		SNMG120412-RM	1.2							★ ● ●																																								
		SNMG120416-RM	1.6							★ ★ ●																																								
		SNMG150612-RM	1.2							● ★ ●																																								
		SNMG150616-RM	1.6							★ ★ ★																																								
		SNMG190612-RM	1.2							★ ● ★																																								
	SNMG190616-RM	1.6							● ● ●																																									
Rough Cutting	RK	SNMG120408-RK	0.8												● ●																																			
		SNMG120412-RK	1.2												● ●																																			
		SNMG120416-RK	1.6												● ●																																			
		SNMG150612-RK	1.2												★ ●																																			
		SNMG150616-RK	1.6												★ ●																																			
		SNMG190612-RK	1.2												★ ●																																			
	SNMG190616-RK	1.6												★ ●																																				
Rough Cutting	RS	SNMG120408-RS	0.8																																															
		SNMG120412-RS	1.2																																															
		SNMG120416-RS	1.6																																															
		SNMG150616-RS	1.6													★ ●																																		
		SNMG190612-RS	1.2													● ●																																		
		SNMG190616-RS	1.6												● ●																																			

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.  
□ : Non stock, produced to order only.







# TURNING INSERTS [NEGATIVE]



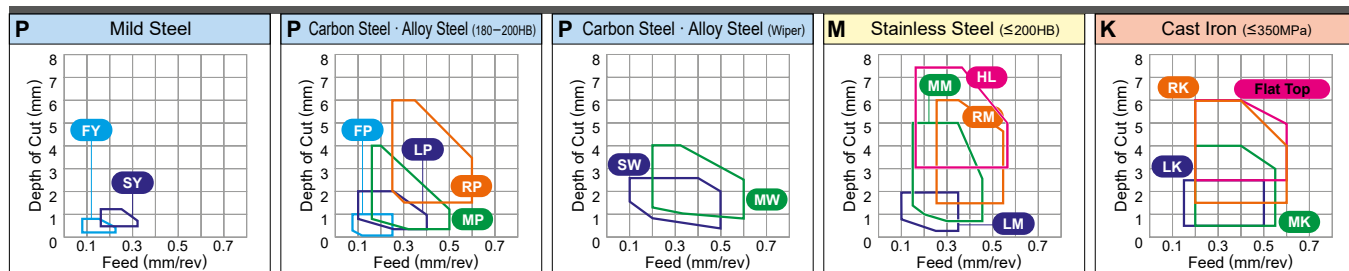
## TN TYPE INSERTS WITH HOLE

**TNMG 16 04 04- LP**

Size Thickness Corner Radius Chipbreaker  
\* Please refer to page A002.

### CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting..... Light Cutting..... Medium Cutting..... Rough Cutting..... Heavy Cutting.....



Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✳ : Unstable Cutting

Shape	Order Number	RE (mm)	Coated										Cermet	Coated Cermet		Carbide		Applicable Holder / Page																			
			UE6105	UE6110	UE6020	NEW MC6115	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015		MC7025	MP7035	US735	US905		MC5005	MC5015	NEW MH515	MP9005	MP9015	NEW MP9025	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi10	RT9010	MT9015
<b>LP</b>  Light Cutting	TNMG160404-LP	0.4	●	★	●	●	●	●	●	●																											
	TNMG160408-LP	0.8	●	●	●	●	●	●																				●									C016
	TNMG160412-LP	1.2	●	★	●	●	●	●																				●									-018
	TNMG220408-LP	0.8	★	★	●	●	●	●																				★									E016
TNMG220412-LP	1.2	★	★	●	●	●	●																													E037	
<b>LM</b>  Light Cutting	TNMG160404-LM	0.4								●	●	●																								C016	
	TNMG160408-LM	0.8								★	●	●																									-018
	TNMG160412-LM	1.2								★	★	★																									E016
																																					E037
<b>LK</b>  Light Cutting	TNMG160404-LK	0.4													●	●																				C016	
	TNMG160408-LK	0.8													●	●																					-018
	TNMG160412-LK	1.2													★	●																					E016
																																					E037
<b>LS</b>  Light Cutting	TNMG160402-LS	0.2															●	●	●																●	C016	
	TNMG160404-LS	0.4															●	●	●																	●	-018
	TNMG160408-LS	0.8															●	●	●																	●	E016
																																					E037
<b>SH</b>  Light Cutting	TNMG160404-SH	0.4	●	●	★	★	★	★						●												●	●	★								C016	
	TNMG160408-SH	0.8	★	●	★	★	★	★						●													●	●	★								-018
	TNMG220408-SH	0.8	●	★	★	★								★																							E016
																																					E037
<b>SA</b>  Light Cutting	TNMG160404-SA	0.4	●	●	★	★	★	★																			★	●								C016	
	TNMG160408-SA	0.8	●	●	★	★	★	★																				★	●								-018
	TNMG160412-SA	1.2	●	●	★	●																						★									E016
	TNMG220408-SA	0.8	★	●	●	★																															E037
	TNMG220412-SA	1.2	●																																		
<b>* SW</b>  Light Cutting (Wiper)	TNMX160404-SW	0.4	●	★																						●	★	●								C017	
	TNMX160408-SW	0.8	●	●																							●	★	★							-018	

\* Please refer to page A028 before using the SW breaker (wiper insert).

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.

TURNING INSERTS

NEG WITH HOLE

C

D

R

S

T

V

W



# TURNING INSERTS [NEGATIVE]



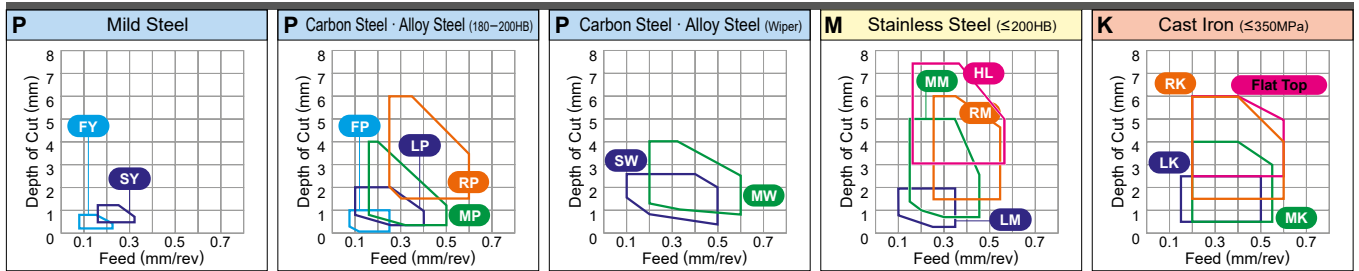
# TN TYPE INSERTS WITH HOLE

## TNMG 16 04 04- GM

Size Thickness Corner Radius Chipbreaker  
\* Please refer to page A002.

### CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting..... Light Cutting..... Medium Cutting..... Rough Cutting..... Heavy Cutting.....



Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

Work Material	P Mild Steel		P Carbon Steel · Alloy Steel (180-200HB)		P Carbon Steel · Alloy Steel (Wiper)		M Stainless Steel (≤200HB)		K Cast Iron (≤350MPa)		Applicable Holder Page																												
	●	●	●	●	●	●	●	●	●	●																													
Work Material	<b>P</b> Steel	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																													
	<b>M</b> Stainless Steel				● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●		● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●		● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																														
	<b>K</b> Cast Iron					● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																													
	<b>N</b> Non-ferrous Metal																																						
	<b>S</b> Heat-resistant Alloy, Titanium Alloy						● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																																
Shape	Order Number	RE (mm)	Coated										Cermet	Coated Cermet	Carbide	Applicable Holder Page																							
			UE6105	UE6110	UE6020	MC6115 NEW	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015					MC7025	MP7035	US735	US905	MC5005	MC5015	MH515 NEW	MP9005	MP9015	MP9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UT120T	HT110	RT9010	MT9015
<b>GM</b> Medium Cutting	TNMG160404-GM	0.4							● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																														
	TNMG160408-GM	0.8							● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																														
	TNMG160412-GM	1.2							★ ● ★																														
	TNMG220408-GM	0.8							★ ★ ★																														
	TNMG220412-GM	1.2							★ ★ ★																														
<b>MA</b> Medium Cutting	TNMG160404-MA	0.4	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●									● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					★																
	TNMG160408-MA	0.8	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●									● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					★																
	TNMG160412-MA	1.2	★ ● ★	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					★ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●									★ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					★																
	TNMG220408-MA	0.8	★ ● ★	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					★ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●									★ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					★																
	TNMG220416-MA	1.6	★ ● ★	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					★ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●									★ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					★																
	TNMG270608-MA	0.8	★ ★	★ ★					□																														
	TNMG270612-MA	1.2	★ ★	★ ★					●																														
	TNMG270616-MA	1.6	★ ★	★ ★																				● ● ●															
TNMG330924-MA	2.4																						● ● ●																
<b>MH</b> Medium Cutting	TNMG160404-MH	0.4	★ ★	★ ●																																			
	TNMG160408-MH	0.8	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●									● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					★																
	TNMG160412-MH	1.2	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●									● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					★																
	TNMG220408-MH	0.8	★ ● ★	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					★ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●									★ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					★																
	TNMG220412-MH	1.2	★ ● ★	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					★ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●									★ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					★																
	<b>Standard</b> Medium Cutting	TNMG110304	0.4	●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																																		
		TNMG110308	0.8	★	★ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																																		
		TNMG160304	0.4	★	★ ★ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																																		
		TNMG160308	0.8	★	★ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																																		
		TNMG160404	0.4	★ ● ★	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																				★	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●													
		TNMG160408	0.8	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					●															★	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●													
		TNMG160412	1.2	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																				●	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●													
		TNMG160416	1.6	★	★ ★ ★																				★	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●													
		TNMG220404	0.4	★ ● ★	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																				★	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●													
TNMG220408		0.8	★ ● ★	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																				★ ★	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●														
TNMG220412	1.2	★ ● ★	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●					●																● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●															
TNMG220416	1.6	★	★ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●																					● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●															
TNMG270608	0.8	★	★ ★ ★																																				
TNMG270612	1.2	★	★ ★ ★																																				
TNMG270616	1.6	★																																					
TNMG330924	2.4																																						

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.  
□ : Non stock, produced to order only.





# TURNING INSERTS [NEGATIVE]

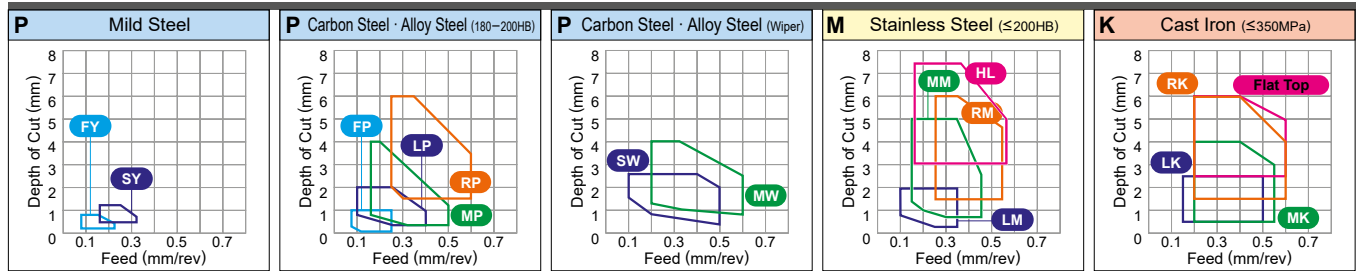


## TNMG 16 04 08- RK

Size Thickness Corner Radius Chipbreaker  
 \* Please refer to page A002.

### CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting..... Light Cutting..... Medium Cutting..... Rough Cutting..... Heavy Cutting.....



Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

Work Material	Coated		Cermet		Coated Cermet		Carbide		Applicable Holder Page		
	UE6105	UE6110	UE620	MC6115	MC6015	MC6025	UH6400	MS6015			
Steel	●	●	●	●	●	●	●	●			
Stainless Steel	●	●	●	●	●	●	●	●			
Cast Iron	●	●	●	●	●	●	●	●			
Non-ferrous Metal	●	●	●	●	●	●	●	●			
Heat-resistant Alloy, Titanium Alloy	●	●	●	●	●	●	●	●			
Shape	Order Number	RE (mm)	Coated					Cermet	Coated Cermet	Carbide	Applicable Holder Page
			UE6105	UE6110	UE620	MC6115	MC6015	MC6025	UH6400	MS6015	
<b>RK</b>  Rough Cutting	TNMG160408-RK	0.8									
	TNMG160412-RK	1.2									C016
	TNMG160416-RK	1.6									-018
	TNMG220408-RK	0.8									E016
	TNMG220412-RK	1.2									E037
TNMG220416-RK	1.6										
<b>RS</b>  Rough Cutting	TNMG160408-RS	0.8									●
	TNMG160412-RS	1.2									●
	TNMG220408-RS	0.8									★
	TNMG220412-RS	1.2									★
<b>GH</b>  Rough Cutting	TNMG160408-GH	0.8	★●	★★				●			
	TNMG160412-GH	1.2	★●	★★				●			
	TNMG220408-GH	0.8	★★	★★				●			
	TNMG220412-GH	1.2	★●	★★				●			
	TNMG220416-GH	1.6	★●	★★				●			
	TNMG270612-GH	1.2	★★	★★				★			
TNMG270616-GH	1.6	★★	★★								
<b>HL</b>  Heavy Cutting	TNMM160408-HL	0.8	●		●●		★				
	TNMM160412-HL	1.2	●		●●		★				
	TNMM220408-HL	0.8	●		●●		●				
	TNMM220412-HL	1.2	●		●●		●				
	TNMM220416-HL	1.6	●		●●		●				
<b>HZ</b>  Heavy Cutting	TNMM160408-HZ	0.8	★		★★						
	TNMM160412-HZ	1.2			★★						
	TNMM220408-HZ	0.8	★								
	TNMM220412-HZ	1.2	★								
TNMM220416-HZ	1.6	★									

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.

TURNING INSERTS

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Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

Work Material	P	Steel	●	●	✦	✦	✦	✦	✦	●																																								
	M	Stainless Steel								●	●	✦	✦																																					
Shape	K	Cast Iron									●	●	●	●	●	●	●	●	●	●	●	●																												
	N	Non-ferrous Metal																					●	●																										
	S	Heat-resistant Alloy, Titanium Alloy								●													●	●																										
Order Number	RE (mm)	Coated													Cermet	Coated Cermet	Carbide	Applicable Holder Page																																
		UE6105	UE6110	UE6020	<b>MC6115 NEW</b>	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	US905	MC5005	MC5015		<b>MH515 NEW</b>	MP9005	MP9015	<b>MP9025 NEW</b>	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi10	RT9010	MT9015															
<b>Flat Top</b> 	TNMA160404	0.4													●	●																																		
	TNMA160408	0.8														●	●																	●																
	TNMA160412	1.2														●	●																																	
	TNMA160416	1.6														●	●																																	
	TNMA160420	2.0														★	★																																	
	TNMA220404	0.4																																																
	TNMA220408	0.8														●	●											★								★	●													
	TNMA220412	1.2														●	●																																	
TNMA220416	1.6														●	●																			★															
<b>Flat Top</b> 	TNGA110304	0.4																																																
	TNGA110308	0.8																																																
	TNGA160402	0.2																																																
	TNGA160404	0.4																																																
	TNGA220404	0.4																																																

● = NEW

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TURNING INSERTS

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# TURNING INSERTS [NEGATIVE]



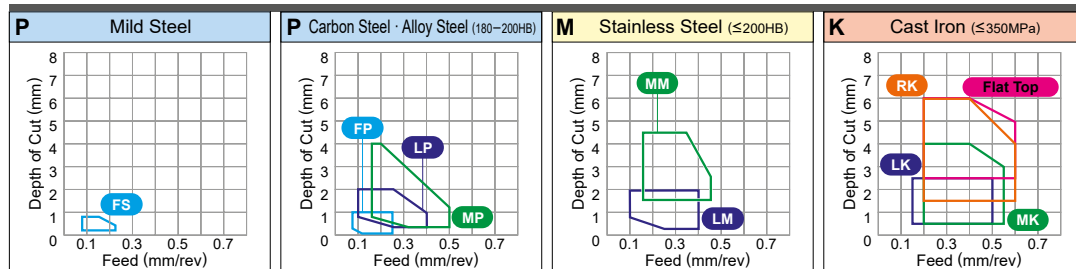
## 35° VN TYPE INSERTS WITH HOLE

VNMG 16 04 04- MS

Size Thickness Corner Radius Chipbreaker  
\* Please refer to page A002.

### CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting..... Light Cutting..... Medium Cutting..... Rough Cutting..... Heavy Cutting.....



TURNING INSERTS

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Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

Work Material	Shape	Order Number	RE (mm)	Coated		Cermets		Coated Cermets		Carbide		Applicable Holder Page									
				UE6105	UE6110	NX2525	NX3035	MP3025	AP25N	VP25N	HT110		RT9010	MT9015							
				UE620	MC6115 NEW	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015		MC7025	MP7035	US735	US905	MC5005	MC5015	MH515 NEW	MP9005	MP9015
Steel	* MS	VNMG160404-MS	0.4																		
		VNMG160408-MS	0.8																		
Stainless Steel	MS	VNMG160404-MS	0.4	●																	
		VNMG160408-MS	0.8	★								●									
Cast Iron	GK	VNMG160404-GK	0.4																		
		VNMG160408-GK	0.8																		
		VNMG160412-GK	1.2																		
Non-ferrous Metal	GM	VNMG160404-GM	0.4																		
		VNMG160408-GM	0.8																		
Heat-resistant Alloy, Titanium Alloy	MA	VNMG160404-MA	0.4	●●	●●	●●	●●	●●	●●	●●	●●	●●									
		VNMG160408-MA	0.8	●●	●●	●●	●●	●●	●●	●●	●●	●●									
	MH	VNMG160404-MH	0.4	★●	★★																
		VNMG160408-MH	0.8	●★	●●●●★																
	Standard	VNMG160404	0.4	●●	●●	●●	●●	●●	●●	●●	●●	●●									
		VNMG160408	0.8	●●	●●	●●	●●	●●	●●	●●	●●	●●									
		VNMG160412	1.2	●●	●●	●●	●●	●●	●●	●●	●●	●●									

\*Newly designed breakers : MP9005, MP9015, MP9025, MT9015

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.



# TURNING INSERTS [NEGATIVE]



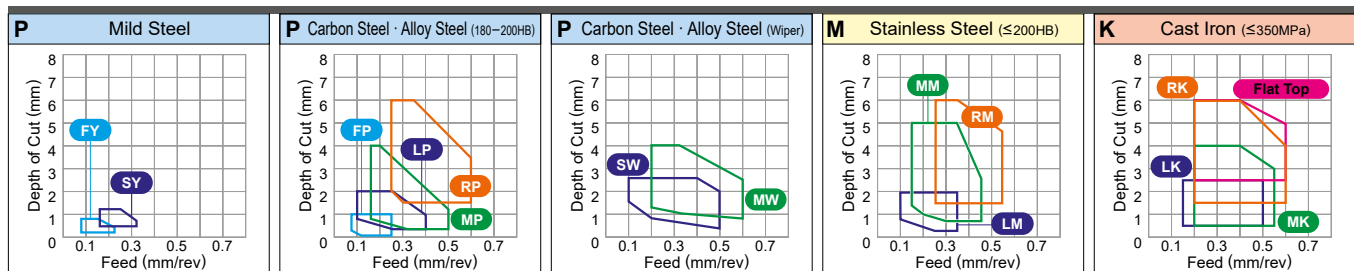
## WN TYPE INSERTS WITH HOLE

### WNMG 08 04 02- FP

Size Thickness Corner Radius Chipbreaker  
\* Please refer to page A002.

### CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting..... Light Cutting..... Medium Cutting..... Rough Cutting..... Heavy Cutting.....



Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

Work Material	P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	S Heat-resistant Alloy, Titanium Alloy	Coated															Cermat	Coated Cermat	Carbide	Applicable Holder Page																
						UE6105	UE6110	UE6020	NEW MC6115	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	US905	MC5005					MC5015	NEW MH515	NEW MP9005	NEW MP9015	NEW MP9025	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UT120T	HT110
<b>FP</b>  Finish Cutting	WNMG080402-FP	0.2																																						
	WNMG080404-FP	0.4			●●																				●	●													C022	
	WNMG080408-FP	0.8			●●																				●	●													C023	
	WNMG080412-FP	1.2			●●																				●	●												E017		
<b>FH</b>  Finish Cutting	WNMG080404-FH	0.4	★																						●	★														
	WNMG080408-FH	0.8	★																						●	★★													C022	
<b>FS</b>  Finish Cutting	WNMG080404-FS	0.4																								●													C022	
	WNMG080408-FS	0.8																							●													C023		
<b>LP</b>  Light Cutting	WNMG060404-LP	0.4	★★		●●●																																			
	WNMG060408-LP	0.8	●★		●●●																																			
	WNMG06T304-LP	0.4	★★		●●●																																			
	WNMG06T308-LP	0.8	★★		●●●																																			
<b>LM</b>  Light Cutting	WNMG080404-LP	0.4	●●	●●●	●●●																																			
	WNMG080408-LP	0.8	★●	●●●	●●●																																			
	WNMG080404-LM	0.4	★★		●●●																																			
	WNMG080408-LM	0.8	★★		●●●																																			

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.





# TURNING INSERTS [NEGATIVE]



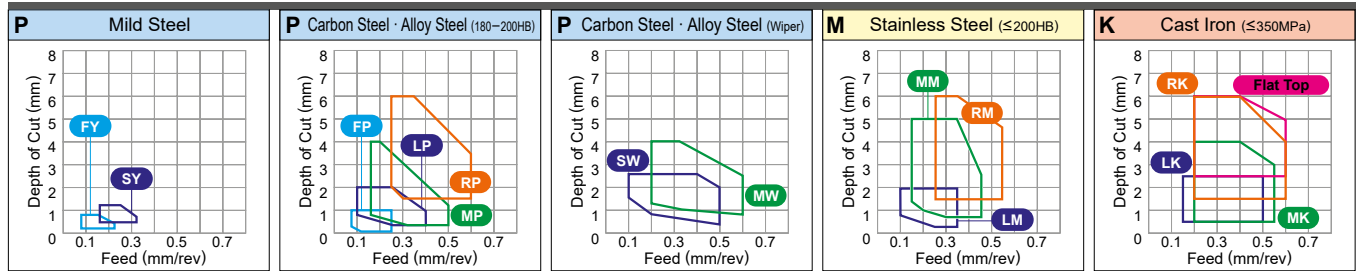
## WN TYPE INSERTS WITH HOLE

### WNMG 06 04 04- MP

Size Thickness Corner Radius Chipbreaker  
\* Please refer to page A002.

#### CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting..... Light Cutting..... Medium Cutting..... Rough Cutting..... Heavy Cutting.....



Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

Work Material	Shape	Order Number	RE (mm)	Coated															Cermet	Coated Cermet		Carbide			Applicable Holder / Page															
				UE6105	UE6110	UE6020	NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	US905		MC5005	MC5015	NEW MH515	NEW MP9005	NEW MP9015		NEW MP9025	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UT120T	HT110	RT9010	MT9015	
P Mild Steel		WNMG060404-MP	0.4	●●																																				
		WNMG060408-MP	0.8	●●																																				
		WNMG060412-MP	1.2	●★																																				
		WNMG06T304-MP	0.4	★●																																				
		WNMG06T308-MP	0.8	★●																																				
		WNMG06T312-MP	1.2	★★																																				
		WNMG080404-MP	0.4	★●	●●	●●	●●																																	
		WNMG080408-MP	0.8	●●	●●	●●	●●																																	
		WNMG080412-MP	1.2	●●	●●	●●	●●																																	
		WNMG080416-MP	1.6	●★	●●	●●	●●																																	
MM Medium Cutting		WNMG060408-MM	0.8							★●●																														
		WNMG060412-MM	1.2							★●●																														
		WNMG080408-MM	0.8							●●●																														
		WNMG080412-MM	1.2							●●●																														
MK Medium Cutting		WNMG080404-MK	0.4													●●																								
		WNMG080408-MK	0.8													●●																								
		WNMG080412-MK	1.2													●●																								
		WNMG080416-MK	1.6													★●																								
* MS Medium Cutting		WNMG080404-MS	0.4													●●●																						●		
		WNMG080408-MS	0.8													●●●																					●			
		WNMG080412-MS	1.2													●●●																					★			
MS Medium Cutting		WNMG060404-MS	0.4	★											●																									
		WNMG060408-MS	0.8	★												●																								
		WNMG06T304-MS	0.4	●												●																								
		WNMG06T308-MS	0.8	★												●																								
		WNMG080404-MS	0.4	●												●																								
		WNMG080408-MS	0.8	●												●●																								
WNMG080412-MS	1.2	★												●●																										

\*Newly designed breakers : MP9005, MP9015, MP9025, MT9015

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.  
□ : Non stock, produced to order only.





















# TURNING INSERTS [POSITIVE]

## 80° CC TYPE INSERTS WITH HOLE

### CCGT 06 02 V3 R-SS

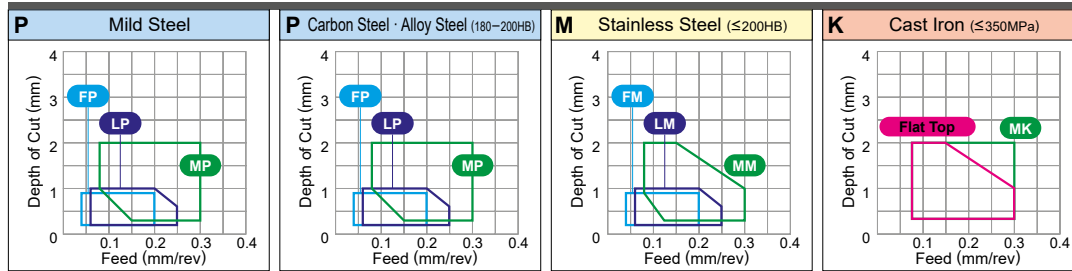
Size Thickness Corner Radius R/L Chipbreaker  
\* Please refer to page A002.

#### CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting.....

Light Cutting.....

Medium Cutting.....



Cutting Conditions (Guide) : ●: Stable Cutting ●: General Cutting ✦: Unstable Cutting

Work Material	Steel		Stainless Steel		Cast Iron		Non-ferrous Metal		Heat-resistant Alloy, Titanium Alloy																															
	P	M	M	M	K	K	N	N	S	S																														
Shape	Order Number	RE (mm)	Coated						Cermets	Coated Cermets	Carbides	Applicable Holder Page																												
			UE6105	UE6110	MC6015	MC6025	UH6400	MS6015					MC7025	MP7035	US735	US905	MC5005	MC5015	MH515	MP9005	MP9015	MP9025	MS9025	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi10	RT9010	MT9005	MT9015		
R/L-SS	CCGT0602V3R-SS	0.03																																						
	CCGT0602V3L-SS	0.03																																						
	CCGT060201R-SS	0.1																																						
	CCGT060201L-SS	0.1																																						
	CCGT060202R-SS	0.2																																						
	CCGT060202L-SS	0.2																																						
	CCGT09T3V3R-SS	0.03																																						
	CCGT09T3V3L-SS	0.03																																						
	CCGT09T301R-SS	0.1																																						
	CCGT09T301L-SS	0.1																																						
	CCGT09T302R-SS	0.2																																						
	CCGT09T302L-SS	0.2																																						
	CCGT060201MR-SS	0.08								●																														
	NEW CCGT060201ML-SS	0.08								●																														
	CCGT060202MR-SS	0.18								●																														
	NEW CCGT060202ML-SS	0.18								●																														
	CCGT09T301MR-SS	0.08								●																														
	NEW CCGT09T301ML-SS	0.08								●																														
	CCGT09T302MR-SS	0.18								●																														
	NEW CCGT09T302ML-SS	0.18								●																														
CCGT09T304MR-SS	0.38								●																															
NEW CCGT09T304ML-SS	0.38								●																															
MP	CCMT060204-MP	0.4	●	●	●																●	●																		
	CCMT060208-MP	0.8	●	●	●																	★	★																	
	CCMT09T304-MP	0.4	●	●	●																	●	●																	
	CCMT09T308-MP	0.8	●	●	●																	●	●																	
	CCMT120404-MP	0.4	●	●	●																	★	●																	
	CCMT120408-MP	0.8	●	●	●																	●	★																	
Medium Cutting	CCMT120412-MP	1.2	★	●	●																★	★																		
MM	CCMT060204-MM	0.4						●	●												●																			
	CCMT060208-MM	0.8						●	●												●																			
	CCMT09T304-MM	0.4						●	●												●																			
	CCMT09T308-MM	0.8						●	●												●																			
	CCMT120404-MM	0.4						●	●												●																			
	CCMT120408-MM	0.8						●	●												●																			
	Medium Cutting	CCMT120412-MM	1.2					●	★												●																			

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.



# TURNING INSERTS [POSITIVE]



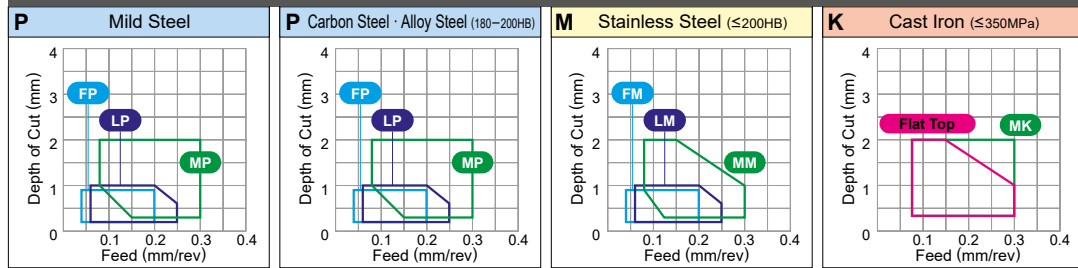
**CCET 06 02 04 R-SR**  
 Size Thickness Corner Radius R/L Chipbreaker  
 \* Please refer to page A002.

## CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting.....

Light Cutting.....

Medium Cutting.....



Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

Work Material	P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	S Heat-resistant Alloy, Titanium Alloy	Coated																		Cermet	Coated Cermet	Carbide	Applicable Holder Page															
						UE6105	UE6110	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US735	US905	MC5005	MC5015	MH515	MP9005	MP9015	MP9025	MS9025	VP05RT					VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTI20T	HT110	RT9010	MT9005	MT9015	
R/L-SR	CCET060204R-SR	0.4																																								
	CCET060204L-SR	0.4																																								
	CCET09T3V3R-SR	0.03																																								
	CCET09T3V3L-SR	0.03																																								
	CCET09T301R-SR	0.1																																								
	CCET09T301L-SR	0.1																																								
	CCET09T302R-SR	0.2																																								
	CCET09T302L-SR	0.2																																								
	CCET09T304R-SR	0.4																																								
	CCET09T304L-SR	0.4																																								
R/L-SN	CCGT0602V3R-SN	0.03																																								
	CCGT060201R-SN	0.1																																								
	CCGT060201L-SN	0.1																																								
	CCGT060202R-SN	0.2																																								
	CCGT060202L-SN	0.2																																								
	CCGT09T3V3R-SN	0.03																																								
	CCGT09T3V3L-SN	0.03																																								
	CCGT09T301R-SN	0.1																																								
	CCGT09T301L-SN	0.1																																								
	CCGT09T302R-SN	0.2																																								
CCGT09T302L-SN	0.2																																									
CCGT09T304R-SN	0.4																																									
CCGT09T304L-SN	0.4																																									
CCGT060201MR-SN	0.08																																									
NEW CCGT060201ML-SN	0.08																																									
CCGT060202MR-SN	0.18																																									
NEW CCGT060202ML-SN	0.18																																									
CCGT09T301MR-SN	0.08																																									
NEW CCGT09T301ML-SN	0.08																																									
CCGT09T302MR-SN	0.18																																									
NEW CCGT09T302ML-SN	0.18																																									
CCGT09T304MR-SN	0.38																																									
NEW CCGT09T304ML-SN	0.38																																									

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.  
 □ : Non stock, produced to order only.



















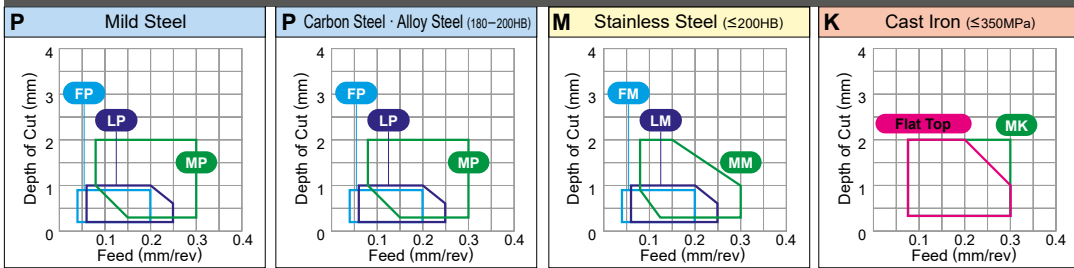






CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting..... Light Cutting..... Medium Cutting.....



Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

Work Material	Shape	Order Number	RE (mm)	Coated													Cermet	Coated Cermet		Carbide				Applicable Holder Page																	
				UE6105	UE6110	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US735	US905	MC5005	MC5015	MH515		MP9005	MP9015	MP9025	MS9025	VP05RT	VP10RT		VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UT120T	HT110	RT9010	MT9005	MT9015				
P Steel	FP	SCMT09T304-FP	0.4	★ ● ●																																					
		SCMT09T308-FP	0.8	★ ● ●																																					
M Stainless Steel	FM	SCMT09T304-FM	0.4																																						
		SCMT09T308-FM	0.8																																						
K Cast Iron	FV	SCMT09T304-FV	0.4																																						
P Steel	LP	SCMT09T304-LP	0.4	● ● ●																																					
		SCMT09T308-LP	0.8	★ ● ●																																					
M Stainless Steel	LM	SCMT09T304-LM	0.4																																						
		SCMT09T308-LM	0.8																																						
P Steel	MP	SCMT09T304-MP	0.4	★ ● ●																																					
		SCMT09T308-MP	0.8	● ● ●																																					
		SCMT120404-MP	0.4	★ ● ●																																					
		SCMT120408-MP	0.8	★ ● ●																																					
M Stainless Steel	MM	SCMT09T304-MM	0.4																																						
		SCMT09T308-MM	0.8																																						
		SCMT120404-MM	0.4																																						
		SCMT120408-MM	0.8																																						

● = NEW

A  
 TURNING INSERTS

POSITION

WITH HOLE

C

D

R

S

T

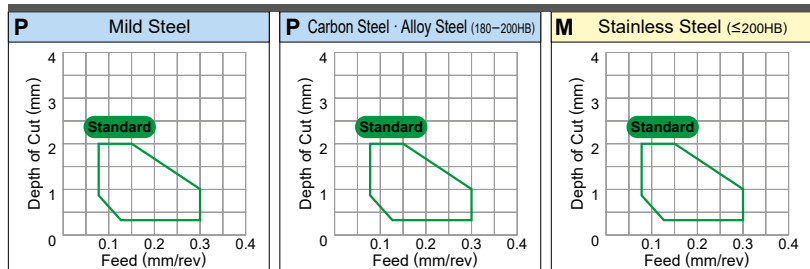
V

W



### CHIP CONTROL RANGE FOR WORK MATERIALS

Medium Cutting.....



Cutting Conditions (Guide) : ●: Stable Cutting ●: General Cutting ✨: Unstable Cutting

Work Material	P Steel M Stainless Steel K Cast Iron N Non-ferrous Metal S Heat-resistant Alloy, Titanium Alloy	Cutting Conditions																																			
		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●																			
Shape	Order Number	RE (mm)	Coated										Cermet	Coated Cermet		Carbide			Applicable Holder Page																		
			UE6105	UE6110	MC6015	UH6400	MS6015	MC7025	MP7035	US735	US905	MC5005	MC5015	MH515	NEW	MP9005	MP9015	NEW		MP9025	MS9025	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTI20T	HT110	RT9010	MT9005	MT9015	
Standard	SPMT090304	0.4																						★													
	SPMT090308	0.8																							★												
	SPMT120308	0.8																							●												
Medium Cutting																																					
	Flat Top	SPMW090304	0.4																						★	●					●	●					
		SPMW090308	0.8																							★	●	★				●	●				
		SPMW120304	0.4																							★	●					●	●				
SPMW120308	0.8																							★	●					●	●						
Flat Top																																					
	SPGX090304	0.4																							★									★			
	SPGX090308	0.8																																		★	
	SPGX120304	0.4																																		★	
SPGX120308	0.8																																			★	

● = NEW

TURNING INSERTS

POSI 11°

WITH HOLE











60°

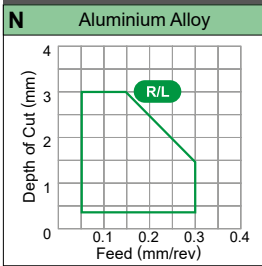
# TE TYPE INSERTS WITH HOLE

## TEGX 16 03 02 R

Size Thickness Corner Radius R/L  
\* Please refer to page A002.

### CHIP CONTROL RANGE FOR WORK MATERIALS

Medium Cutting.....



Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

Work Material	P	Steel	●	●	●	✦	✦	●																												
	M	Stainless Steel					●	✦	✦																											
Shape	K	Cast Iron						●	●	●																										
	N	Non-ferrous Metal																																		
S	S	Heat-resistant Alloy, Titanium Alloy						●			●	●	✦	●																						
			Coated	Cermet										Coated Cermet	Carbide		Applicable Holder Page																			
Order Number	RE (mm)	UE6105	UE6110	MC6015	UH6400	MS6015	MC7025	MP7035	US735	US905	MC5005	MC5015	MH515	MP9005	MP9015	MP9025	MS9025	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UTI20T	HT110	RT9010	MT9005	MT9015				
<b>R/L</b>  Medium Cutting (For Aluminium Alloy)	TEGX160302R	0.2																																		
	TEGX160302L	0.2																																		
	TEGX160304R	0.4																																		
	TEGX160304L	0.4																																		

● = NEW

A

TURNING INSERTS

POSI 20°

WITH HOLE

C

D

R

S

T

V

W

# TURNING INSERTS [POSITIVE]



## TP TYPE INSERTS WITH HOLE

**TPMH 08 02 02- FV**

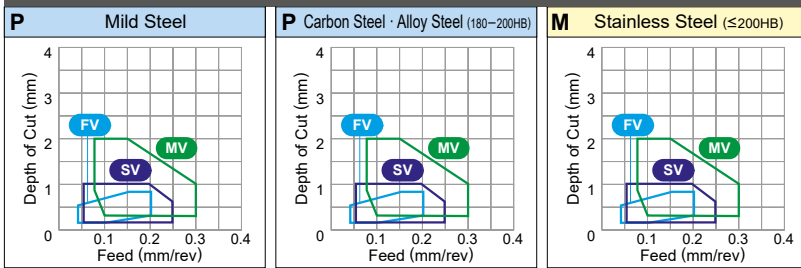
Size Thickness Corner Radius Chipbreaker  
\* Please refer to page A002.

### CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting.....

Light Cutting.....

Medium Cutting.....



Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting

Work Material	Shape	Order Number	RE (mm)	Coated																			Cermet	Coated Cermet		Carbide		Applicable Holder Page									
				UE6105	UE6110	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US735	US905	MC5005	MC5015	MH515	MP9005	MP9015	MP9025	MS9025	VP05RT	VP10RT		VP15TF	UP20M	NX2525	NX3035		MP3025	AP25N	VP25N	VP45N	UTI20T	HT110	RT9010	MT9005	MT9015
				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●	●	●	●	●	●	●	●
Steel	FV	TPMH080202-FV	0.2																				●	●	●												
		TPMH080204-FV	0.4																					●	●	●											
		TPMH090202-FV	0.2																					●	●	●	●										
		TPMH090204-FV	0.4																					●	●	●	●										
		TPMH110302-FV	0.2																					●	●	●	●										
		TPMH110304-FV	0.4																					●	●	●	●										
		TPMH110308-FV	0.8																					●	●	●	●										
		TPMH160302-FV	0.2																					●	●	●	●										
Cast Iron	Finish Cutting	TPMH160304-FV	0.4																				●	●	●	●											
		TPMH160308-FV	0.8																					●	●	●	●										
Non-ferrous Metal	R/L-FS	TPGH080202R-FS	0.2																				●	●	●								●				
		TPGH080202L-FS	0.2																					●	●	●	●							●			
		TPGH080204R-FS	0.4																					●	●	●								●			
		TPGH080204L-FS	0.4																					●	●	●	●							●			
		TPGH090202R-FS	0.2																					●	●	●								●			
		TPGH090202L-FS	0.2																					●	●	●	●							●			
		TPGH090204R-FS	0.4																					●	●	●								●			
		TPGH090204L-FS	0.4																					●	●	●	●							●			
		TPGH090208R-FS	0.8																					●	●	●								●			
		TPGH090208L-FS	0.8																					●	●	●	●							●			
		TPGH110302R-FS	0.2																					●	●	●								●			
		TPGH110302L-FS	0.2																					●	●	●	●							●			
		TPGH110304R-FS	0.4																					●	●	●								●			
		TPGH110304L-FS	0.4																					●	●	●	●							●			
		TPGH160304R-FS	0.4																					●	●	●								●			
		TPGH160304L-FS	0.4																					●	●	●	●							●			
		Steel	R/L	TPGX080202R	0.2																				●	●	●										
				TPGX080202L	0.2																					●	●	●							●	●	
TPGX080204R	0.4																							●	●	●								●	●		
TPGX080204L	0.4																							●	●	●								●	●		
TPGX090202R	0.2																							●	●	●											
TPGX090202L	0.2																								●	●	●	●							●	●	
TPGX090204R	0.4																							●	●	●											
TPGX090204L	0.4																							●	●	●											
TPGX090208R	0.8																								●	●	●										
TPGX090208L	0.8																							●	●	●											

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.









































# TURNING INSERTS [POSITIVE]



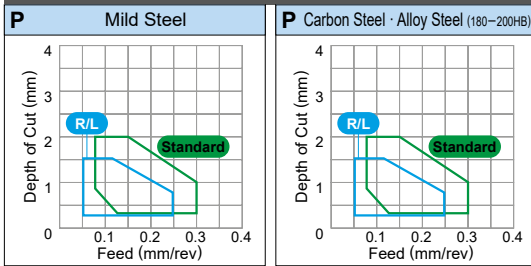
**TPGR 11 03 04 R**

Size Thickness Corner Radius R/L  
\* Please refer to page A002.

## CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting.....

Medium Cutting.....



Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting

Work Material	P	Steel	● ● ● ● ✦ ●	Coated										Cermet	Coated Cermet	Carbide	Applicable Holder Page																							
	M	Stainless Steel	● ● ● ● ✦ ●	UE6105	UE6110	MC6015	MC6025	UH6400	MS6015	MC7025	MP7035	US735	US905	MC5005	MC5015	MH515		MP9005	MP9015	MP9025	MS9025	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	VP45N	UT120T	HT110	RT9010	MT9005	MT9015				
Shape	Order Number	RE (mm)		Coated										Cermet	Coated Cermet	Carbide																								
R/L	TPGR110304R	0.4																																						
	TPGR110304L	0.4																																						
	TPGR160304R	0.4																																						
	TPGR160304L	0.4																																						
	TPGR160308R	0.8																																						
80 Breaker	TPMR110304-80	0.4	●																																					
	TPMR110308-80	0.8	●																																					
	TPMR160304-80	0.4	●																																					
	TPMR160308-80	0.8	●																																					
Standard	TPMR090202	0.2																								★	★													
	TPMR090204	0.4																								●	★	●												
	TPMR090208	0.8																									★													
	TPMR110302	0.2																								●	★	★												
	TPMR110304	0.4	●																							●	●	●												
	TPMR110308	0.8	●																							●	●	●												
	TPMR160304	0.4	●																							●	●	●												
	TPMR160308	0.8	●																							●	★	●												
Flat Top	TPMR160312	1.2	●																						★	●														
	TPMN110208	0.8																																						
	TPMN110304	0.4	●											★	●										●	●														
	TPMN110308	0.8	★											●	●											★														
	TPMN160304	0.4	●											●	●										★	★	●													
	TPMN160308	0.8	●											●	●										★	●	●													
	TPMN160312	1.2	★											★	●											●														
	TPMN160320	2.0																																						
	TPMN220404	0.4	★																																					
TPMN220408	0.8	★																							★	●														
TPMN220408T	0.8																								●															
TPMN220412	1.2	★																																						

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.



# Memo

---

A series of horizontal dashed lines for writing, spanning the width of the page.

# Memo

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A series of horizontal dashed lines for writing, spanning the width of the page.

# HOW TO READ THE STANDARD OF PCBN&PCD TURNING INSERTS

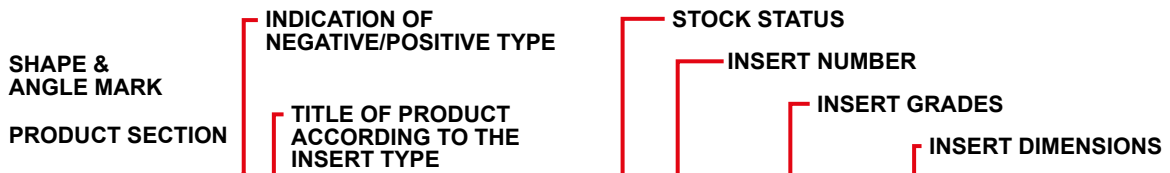
## ● How this section page is organised

- ① Organised according to turning insert shape.  
(Refer to the index on the next page.)
- ② Inserts are arranged in order of :
  - Negative inserts (with hole→without hole)
  - Positive inserts (with hole→without hole)

### GRADE APPLICATION RECOMMENDED FOR EACH WORK MATERIAL

Cutting conditions suitable for each type of work material is shown as a general guide to select the grade.

● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting



**PCBN TURNING INSERTS [NEGATIVE]**

**80° CN TYPE INSERTS WITH HOLE**

Work Material	Shape	Order Number	Coated PCBN	PCBN	Dimensions (mm)					Geometry	Applicable Holder Page
					IC	S	RE	D1	LE		
K Cast Iron	NEW PETIT CO	NP-CNGA120404GS4	●●●●●	●●●●●	12.74.76	0.4	1.8	5.16			
		NP-CNGA120404GS4	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120412GS4	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			
		NP-CNGA120404GA4	●●●●●	●●●●●	12.74.76	0.4	1.8	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120408GA4	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
		NP-CNGA120412GA4	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120408GH4	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
		NP-CNGA120412GH4	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120404VA4	●●●●●	●●●●●	12.74.76	0.4	1.8	5.16			
		NP-CNGA120408VA4	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120412VA4	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			
		NP-CNGA120404FS4	●●●●●	●●●●●	12.74.76	0.4	1.8	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120408FS4	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
		NP-CNGA120412FS4	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120404TS4	●●●●●	●●●●●	12.74.76	0.4	1.8	5.16			
		NP-CNGA120408TS4	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120412TS4	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			
		NP-CNGA120404TA4	●●●●●	●●●●●	12.74.76	0.4	1.8	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120408TA4	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
		NP-CNGA120412TA4	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120404TH4	●●●●●	●●●●●	12.74.76	0.4	1.8	5.16			
		NP-CNGA120408TH4	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120412TH4	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			
		NP-CNGA120404SW54	●●●●●	●●●●●	12.74.76	0.4	1.8	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120408SW54	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
		NP-CNGA120412SW54	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			

**PCBN TURNING INSERTS [POSITIVE]**

Work Material	Shape	Order Number	Coated PCBN	PCBN	Dimensions (mm)					Geometry	Applicable Holder Page
					IC	S	RE	D1	LE		
K Cast Iron	NEW PETIT CO	NP-CNGA120402GS2	●●●●●	●●●●●	12.74.76	0.2	1.7	5.16			
		NP-CNGA120404GS2	●●●●●	●●●●●	12.74.76	0.4	1.8	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120408GS2	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
		NP-CNGA120412GS2	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120402GA2	●●●●●	●●●●●	12.74.76	0.2	1.7	5.16			
		NP-CNGA120404GA2	●●●●●	●●●●●	12.74.76	0.4	1.8	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120408GA2	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
		NP-CNGA120412GA2	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120402GH2	●●●●●	●●●●●	12.74.76	0.2	1.7	5.16			
		NP-CNGA120404GH2	●●●●●	●●●●●	12.74.76	0.4	1.8	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120408GH2	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
		NP-CNGA120412GH2	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120404VA2	●●●●●	●●●●●	12.74.76	0.4	1.8	5.16			
		NP-CNGA120408VA2	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120412VA2	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			
		NP-CNGA120402FS2	●●●●●	●●●●●	12.74.76	0.2	1.7	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120404FS2	●●●●●	●●●●●	12.74.76	0.4	1.8	5.16			
		NP-CNGA120408FS2	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120412FS2	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			
		NP-CNGA120404TS2	●●●●●	●●●●●	12.74.76	0.4	1.8	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120408TS2	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
		NP-CNGA120412TS2	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120404TA2	●●●●●	●●●●●	12.74.76	0.4	1.8	5.16			
		NP-CNGA120408TA2	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120412TA2	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			
		NP-CNGA120404TH2	●●●●●	●●●●●	12.74.76	0.4	1.8	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120408TH2	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
		NP-CNGA120412TH2	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120404SF2	●●●●●	●●●●●	12.74.76	0.4	1.8	5.16			
		NP-CNGA120408SF2	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120412SF2	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			
		NP-CNGA120404SE2	●●●●●	●●●●●	12.74.76	0.4	1.8	5.16			
S High-Speed Alloy, Titanium Alloy	NEW PETIT CO	NP-CNGA120408SE2	●●●●●	●●●●●	12.74.76	0.8	2.0	5.16			
		NP-CNGA120412SE2	●●●●●	●●●●●	12.74.76	1.2	2.2	5.16			

● : Inventory maintained. \* : Inventory maintained in Japan.

GRADES → B004 IDENTIFICATION → B002

**LEGEND FOR STOCK STATUS MARK**  
Is shown on the left hand page of each double-page spread.

**PHOTO OF INSERT**

**PRODUCT NAME**

**PAGE REFERENCE**  
· CHIPBREAKERS  
· GRADES  
· TECHNICAL DATA  
Indicates reference pages, on the right hand page of each double-page spread.

**APPLICABLE HOLDER PAGE**  
Indicates reference pages for details of applicable holders.

**FIGURE SHOWING THE INSERT GEOMETRY**  
IC: Diameter of Inscribed Circle  
S: Thickness  
RE: Corner Radius  
D1: Diameter of Hole  
LE: Cutting Edge Effective Length  
Dimensions are detailed in the "Dimensions" column.

# TURNING TOOLS

# PCBN & PCD INSERT STANDARDS

# PCBN & PCD INSERT GRADES

IDENTIFICATION .....	B002
CLASSIFICATION OF PCBN & PCD GRADES ..	B004
CBN (CUBIC BORON NITRIDE) .....	B006
PCD (SINTERED DIAMOND) .....	B028
CLASSIFICATION OF PCBN & PCD INSERTS .....	B030

## STANDARD OF PCBN TURNING INSERTS

### NEGATIVE INSERTS WITH HOLE

CN TYPE ... RHOMBIC 80° .....	B036
DN TYPE ... RHOMBIC 55° .....	B039
SN TYPE ... SQUARE 90° .....	B043
TN TYPE ... TRIANGULAR 60° ...	B044
VN TYPE ... RHOMBIC 35° .....	B046
WN TYPE ... TRIGON 80° .....	B048

### NEGATIVE INSERTS WITHOUT HOLE

CN TYPE ... RHOMBIC 80° .....	B049
DN TYPE ... RHOMBIC 55° .....	B049
RN TYPE ... ROUND .....	B049
SN TYPE ... SQUARE 90° .....	B050
TN TYPE ... TRIANGULAR 60° ...	B050

### POSITIVE INSERTS WITH HOLE

CC TYPE ... RHOMBIC 80° .....	B051
CP TYPE ... RHOMBIC 80° .....	B053
DC TYPE ... RHOMBIC 55° .....	B054
TC TYPE ... TRIANGULAR 60° ...	B056
TP TYPE ... TRIANGULAR 60° ...	B057
VB TYPE ... RHOMBIC 35° .....	B059
VC TYPE ... RHOMBIC 35° .....	B060
WC TYPE ... TRIGON 80° .....	B060

### POSITIVE INSERTS WITHOUT HOLE

SP TYPE ... SQUARE 90° .....	B061
TB TYPE ... TRIANGULAR 60° ...	B062
TP TYPE ... TRIANGULAR 60° ...	B062
GY TYPE .....	B063

## STANDARD OF PCD TURNING INSERTS

### NEGATIVE INSERTS WITH HOLE

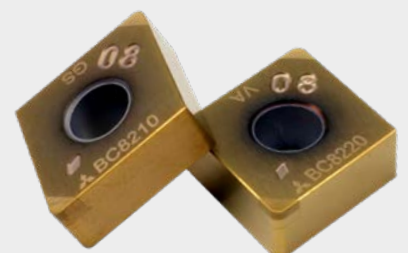
CN TYPE ... RHOMBIC 80° .....	B064
DN TYPE ... RHOMBIC 55° .....	B064
SN TYPE ... SQUARE 90° .....	B065
TN TYPE ... TRIANGULAR 60° ...	B065
VN TYPE ... RHOMBIC 35° .....	B066

### POSITIVE INSERTS WITH HOLE

CC TYPE ... RHOMBIC 80° .....	B067
CP TYPE ... RHOMBIC 80° .....	B067
DC TYPE ... RHOMBIC 55° .....	B068
SP TYPE ... SQUARE 90° .....	B068
TC TYPE ... TRIANGULAR 60° ...	B069
TP TYPE ... TRIANGULAR 60° ...	B070
VB TYPE ... RHOMBIC 35° .....	B071
VC TYPE ... RHOMBIC 35° .....	B071
WC TYPE ... TRIGON 80° .....	B072
WP TYPE ... TRIGON 80° .....	B072
DE TYPE ... RHOMBIC 55° .....	B073
TE TYPE ... TRIANGULAR 60° ...	B073
VD TYPE ... RHOMBIC 35° .....	B074

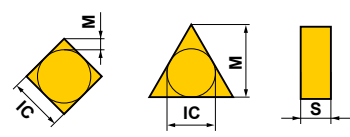
### POSITIVE INSERTS WITHOUT HOLE

SP TYPE ... SQUARE 90° .....	B075
TP TYPE ... TRIANGULAR 60° ...	B075



# IDENTIFICATION

B



Symbol	Tolerance of Nose Height <b>M</b> (mm)	Tolerance of Inscribed Circle <b>IC</b> (mm)	Tolerance of Thickness <b>S</b> (mm)
<b>G</b>	±0.025	±0.025	±0.13
<b>M*</b>	±0.08–±0.18	±0.05–±0.15	±0.13

Inserts marked with \* are sintered.

Detail of M Class Insert Tolerance

● Tolerance of Nose Height **M** (mm)

D.I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
<b>6.35</b>	±0.08	±0.08	±0.08	±0.11	±0.16	—
<b>9.525</b>	±0.08	±0.08	±0.08	±0.11	±0.16	—
<b>12.70</b>	±0.13	±0.13	±0.13	±0.15	—	—

● Tolerance of Inscribed Circle **IC** (mm)








D.I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
<b>6.35</b>	±0.05	±0.05	±0.05	±0.05	±0.05	—
<b>9.525</b>	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
<b>12.70</b>	±0.08	±0.08	±0.08	±0.08	—	±0.08

<b>BM</b>	With Breaker
<b>BF</b>	With Breaker
<b>NP</b>	New Petit Cut
<b>No mark</b>	Standard Type







① Insert Geometry

**NP** - **D** **N** **G** **A**








② Insert Shape

Symbol	Insert Shape
<b>C</b>	Rhombic 80° 
<b>D</b>	Rhombic 55° 
<b>R</b>	Round 
<b>S</b>	Square 
<b>T</b>	Triangular 
<b>V</b>	Rhombic 35° 
<b>W</b>	Trigon 

③ Normal Clearance

Symbol	Normal Clearance
<b>B</b>	5° 
<b>C</b>	7° 
<b>D</b>	15° 
<b>E</b>	20° 
<b>N</b>	0° 
<b>P</b>	11° 

⑤ Fixing and/or for Chipbreaker

Metric				
Symbol	Hole	Hole Configuration	Chip Breaker	Figure
<b>W</b>	With Hole	Cylindrical Hole +	No	
<b>T/V</b>	With Hole	One Countersink (40–60°)	One Sided	
<b>B</b>	With Hole	Cylindrical Hole +	No	
<b>H</b>	With Hole	One Countersink (70–90°)	One Sided	
<b>A</b>	With Hole	Cylindrical Hole	No	
<b>M</b>	With Hole	Cylindrical Hole	One Sided	
<b>N</b>	Without Hole	—	No	
<b>X</b>	—	—	—	Special Design



Diameter of Inscribed Circle (mm)	Symbol						
3.97		<b>02</b>		<b>04</b>	<b>03</b>	<b>03</b>	<b>06</b>
4.76		<b>L3</b>	<b>08</b>	<b>05</b>	<b>04</b>	<b>04</b>	<b>08</b>
5.56		<b>03</b>	<b>09</b>	<b>06</b>	<b>05</b>	<b>05</b>	<b>09</b>
6.35		<b>04</b>	<b>11</b>	<b>07</b>	<b>06</b>	<b>06</b>	<b>11</b>
7.94		<b>05</b>	<b>13</b>	<b>09</b>	<b>08</b>	<b>07</b>	<b>13</b>
9.525	<b>09</b>	<b>06</b>	<b>16</b>	<b>11</b>	<b>09</b>	<b>09</b>	<b>16</b>
12.70	<b>12</b>	<b>08</b>	<b>22</b>	<b>15</b>	<b>12</b>	<b>12</b>	<b>22</b>

**⑥ Insert Size**

\*Thickness is from the bottom of the insert to the top of the cutting edge.

Symbol	Thickness (mm)
<b>S1</b>	1.39
<b>01</b>	1.59
<b>T0</b>	1.79
<b>02</b>	2.38
<b>T2</b>	2.78
<b>03</b>	3.18
<b>T3</b>	3.97
<b>04</b>	4.76

**⑦ Insert Thickness**

Symbol	Corner Radius (mm)
<b>02</b>	0.2
<b>04</b>	0.4
<b>08</b>	0.8
<b>12</b>	1.2
<b>16</b>	1.6

**⑧ Insert Corner Configuration**



**⑨ Application (Honing)**

Symbol	Honing
<b>GS</b> <b>GA</b> <b>GB</b> <b>GH</b>	General Cutting
<b>VA</b>	For High Speed, High Feed Cutting
<b>FS</b> <b>FA</b> <b>FB</b>	Continuous Cutting
<b>TS</b> <b>TA</b> <b>TH</b>	Interrupted Cutting
<b>SF</b> <b>SE</b>	Sintered Alloys Cutting

**⑩ Wiper**

<b>WS</b>	For High Rigidity Workpiece Material
<b>WL</b>	For Deflection and Vibration Prevention
<b>No mark</b>	Without Wiper

**⑪ Number of Teeth**

<b>2</b>	2
<b>3</b>	3
<b>4</b>	4
<b>6</b>	6
<b>No mark</b>	1

**⑫ Cutting Edge Angle**

<b>F</b>	91°
<b>J</b>	93°
<b>No mark</b>	Non Restriction

Please pay special attention when using wiper inserts.

**⑬ Cutting Direction**

Figure	Hand	Symbol
	Right	<b>R</b>
	Left	<b>L</b>
	Neutral	<b>N</b>

Please refer to page B021 for further information.

# CLASSIFICATION OF PCBN & PCD GRADES

## FEATURES

### NON-COATED PCBN MATERIALS

PCBN sintered material base cutting tools are produced by binding CBN (cubic Boron Nitride) and ceramic having hardness next to diamond and sintering them under ultra-high pressure and at high temperature.

PCBN has lower affinity to iron than diamond. The low affinity and high hardness properties means that sintered PCBN delivers a superior cutting performance especially during high speed machining of materials such hardened steel, cast iron and sintered alloys.

B

### COATED PCBN MATERIALS

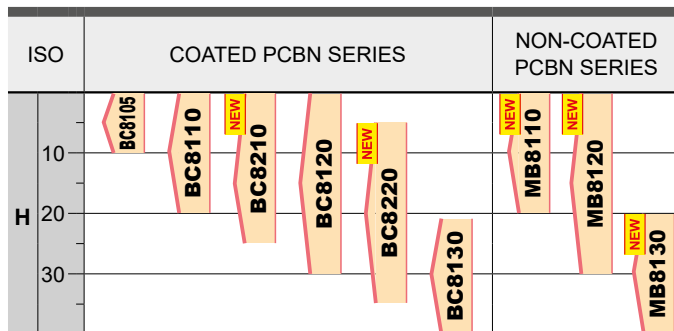
To achieve longer tool life, MITSUBISHI MATERIALS uses a unique "Particle-activated Sintering Method", combined with increased cutting edge strength. With high crater wear resistance PCBN grades, plus a wear resistant ceramic coating, longer tool life and improved machine efficiency are obtained.

### PCD MATERIALS (Sintered Diamond)

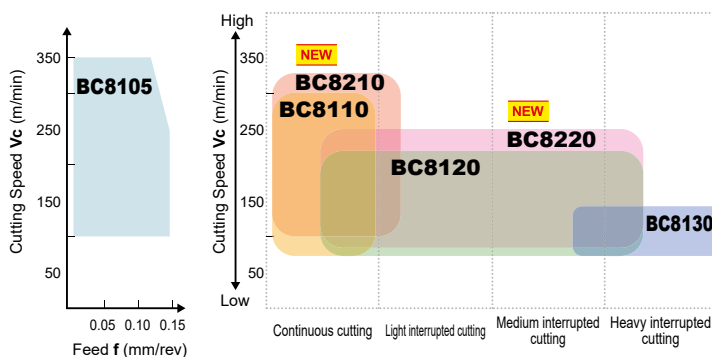
Suitable for cutting materials such as nonferrous metals and fibre reinforced plastics (FRP) including aluminium alloys. It supports ultra high speed finish machining.

## ■ Work materials for turning grades/application area

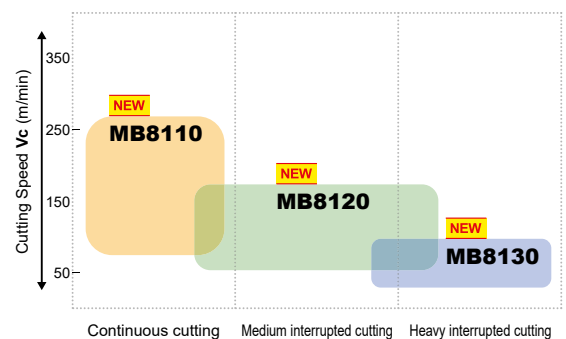
### ● Hardened Steel



### COATED PCBN MATERIALS



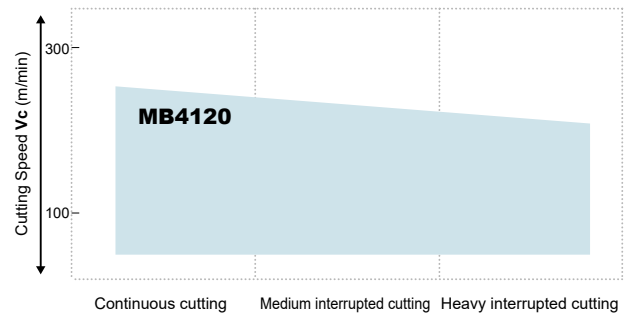
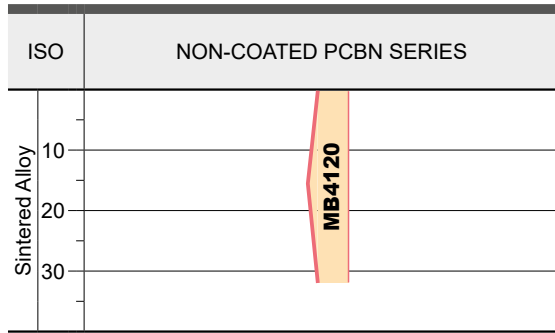
### NON-COATED PCBN MATERIALS



Suitable for finishing with surface roughness Ra 0.6 μm or Rz 2.4 μm or less.

Coated PCBN Grade BC8100/BC8200 and non-coated PCBN Grade MB8100 for high-hardness steel processing are available in a wide range of areas from finishing to continuous cutting of hardened steels and strongly interrupted machining.

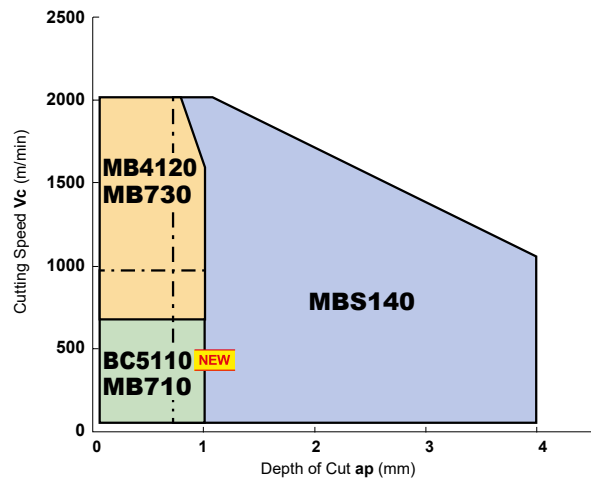
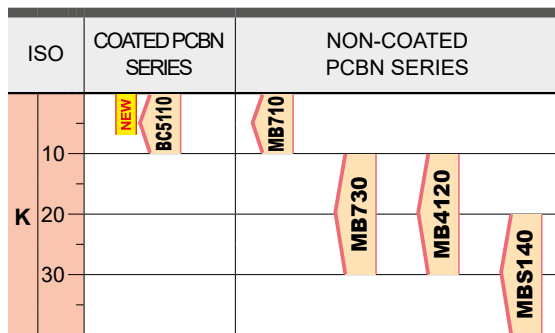
## ● Sintered Alloy



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The PCBN grade "MB4120" for cutting sintered alloys and cast iron can be used over a wide range of applications from continuous to interrupted machining of cast iron and sintered alloy components such as oil pumps and valve mechanisms.

## ● Cast Iron

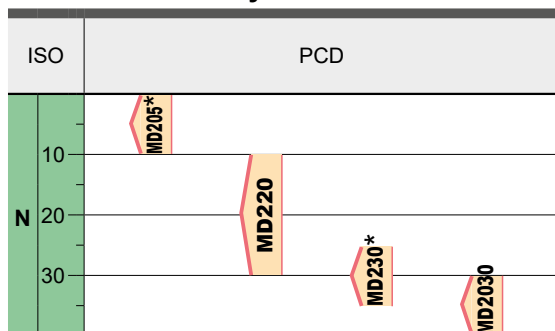


### BC5110

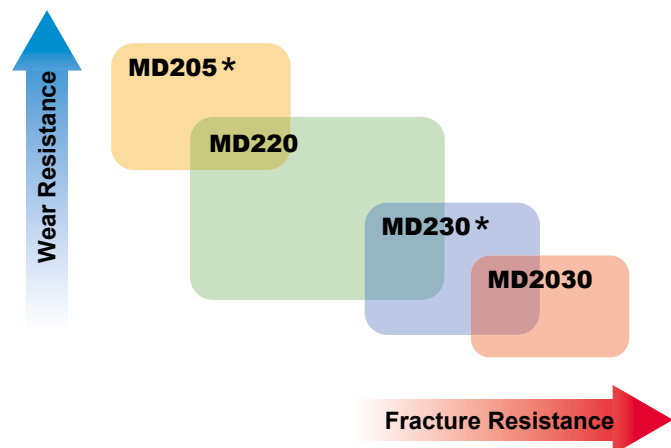
Tough substrate with a high hardness coating provides excellent chipping and wear resistance.

Range of grades available for general to higher depths of cut to enable high efficiency machining.

## ● Aluminium Alloy



\* MD205, MD230 : Non-Standard



Suitable for cutting materials such as nonferrous metals and fiber reinforced plastics (FRP) including aluminium alloys. It supports ultra high speed finish cutting.

# COATED PCBN SERIES

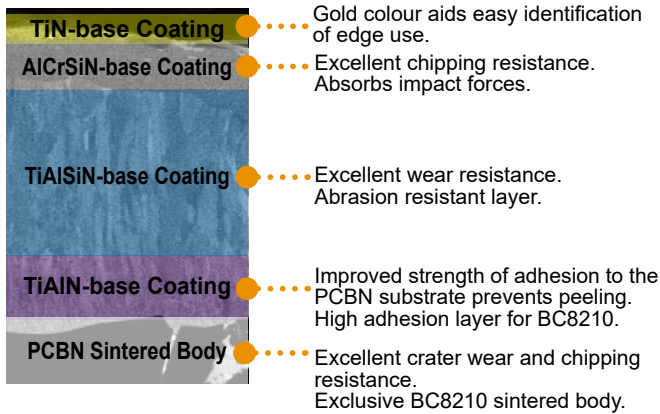
## BC8200 series for machining of hardened steel

### FEATURES

#### ■ A Newly Developed Special Ceramic PVD Coating

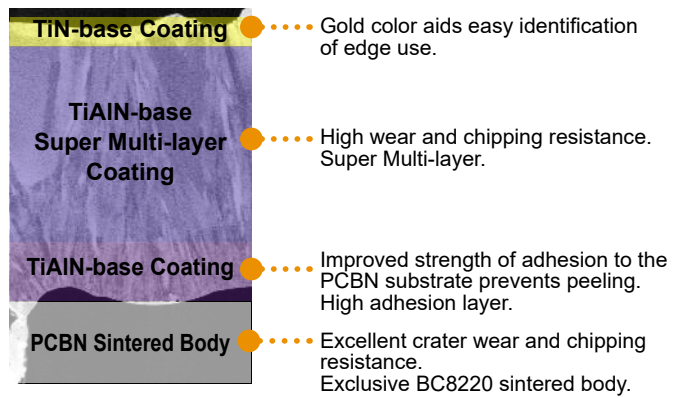
##### BC8210

**NEW**



##### BC8220

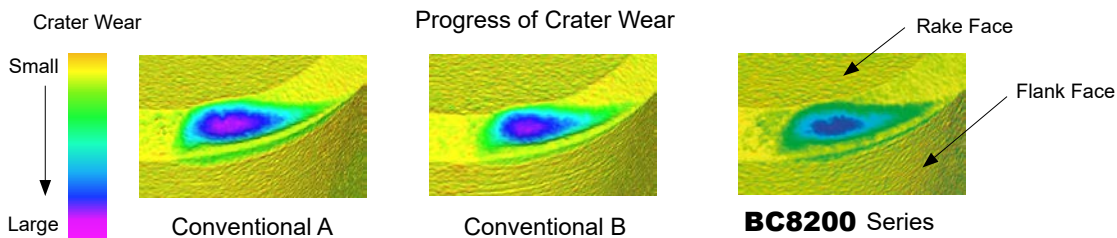
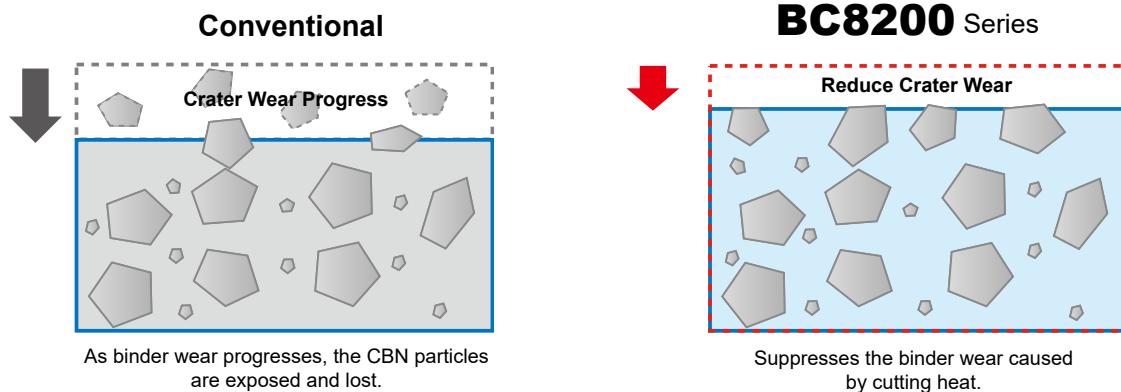
**NEW**



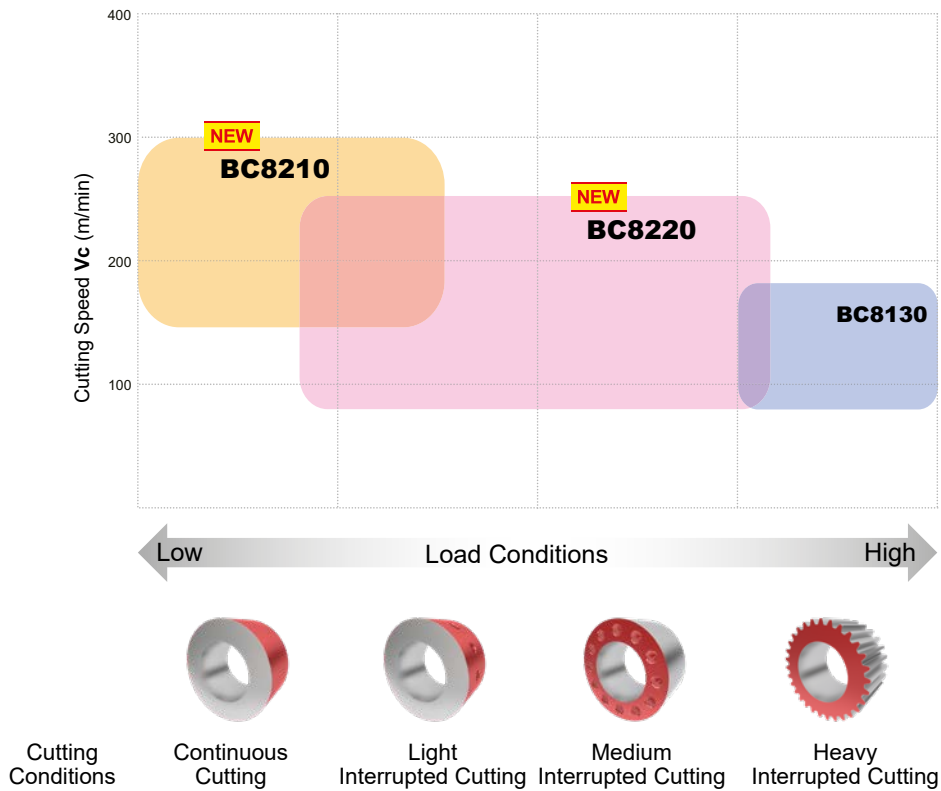
#### ■ Ultra Micro-Particle and Heat Resistant Binder Technology

### Positive Effect of the Newly Developed Heat Resistant Binder

The progress of crater wear is greatly reduced due to the use of a heat resistant binder. This suppresses chipping, crater wear and fracturing.



## Application range



B

## Recommended Cutting Conditions

### BC8210

Workpiece Material	Machining Methods	Cutting Speed $V_c$ (m/min)					Feed per Rev. $f$ (mm/rev)	Depth of Cut $a_p$ (mm)	Cutting Mode
		100	150	200	250	300			
Hardened Steels	Continuous Cutting	[Red bar from 150 to 250]					$\leq 0.2$	$\leq 0.35$	Dry, Wet
	Light Interrupted Cutting	[Red bar from 100 to 200]					$\leq 0.2$	$\leq 0.35$	Dry, Wet

### BC8220

Workpiece Material	Machining Methods	Cutting Speed $V_c$ (m/min)					Feed per Rev. $f$ (mm/rev)	Depth of Cut $a_p$ (mm)	Cutting Mode
		100	150	200	250	300			
Hardened Steels	Continuous Cutting	[Red bar from 150 to 200]					$\leq 0.2$	$\leq 0.5$	Dry, Wet
	Light to Medium Interrupted Cutting	[Red bar from 100 to 150]					$\leq 0.2$	$\leq 0.3$	Dry, Wet

# COATED PCBN SERIES

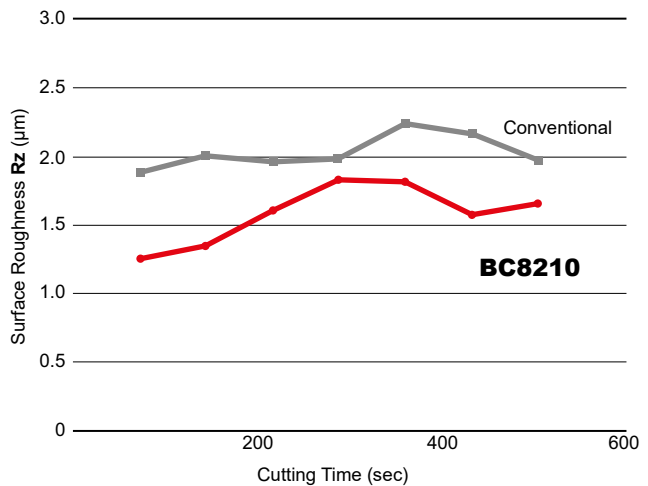
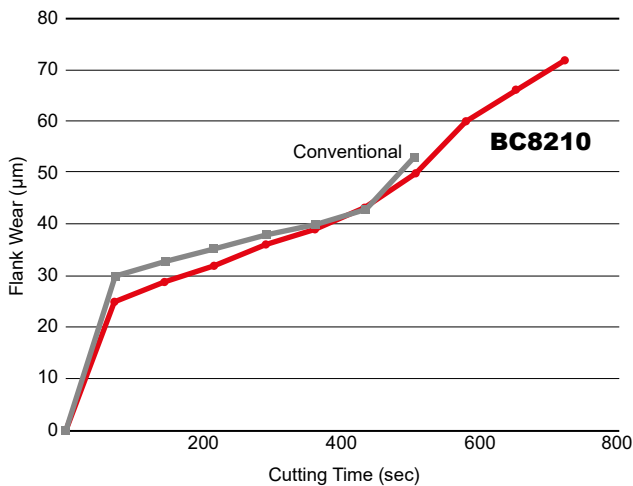
## BC8200 series for machining of hardened steel

### ■ Cutting and application example

## BC8210 For Continuous and Light Interrupted Cutting

### Machining Scr420 (60 HRC): Comparison of Continuous Cutting

BC8210 reduces flank wear and maintains a good finished surface.

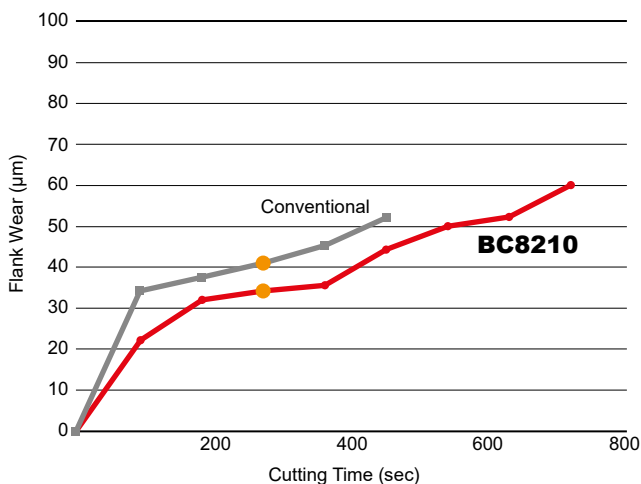


<Cutting Conditions>

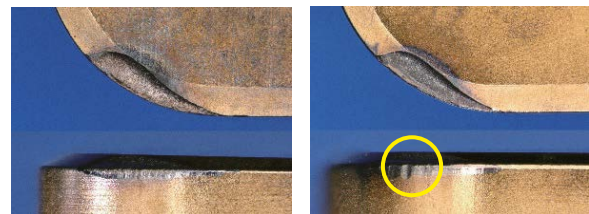
Workpiece Material : JIS SCr420 (60 HRC)  
 Inserts : NP-CNGA120408GS2  
 Cutting Speed : Vc=200 m/min  
 Feed per Rev. : f=0.1 mm/rev  
 Depth of Cut : ap=0.2 mm  
 Cutting Mode : Dry Cutting

### Machining Scr420(60 HRC):Comparison of Light Interrupted Cutting

BC8210 provides excellent chipping resistance.



After machining 360 seconds



**BC8210**

Conventional Product is Chipping

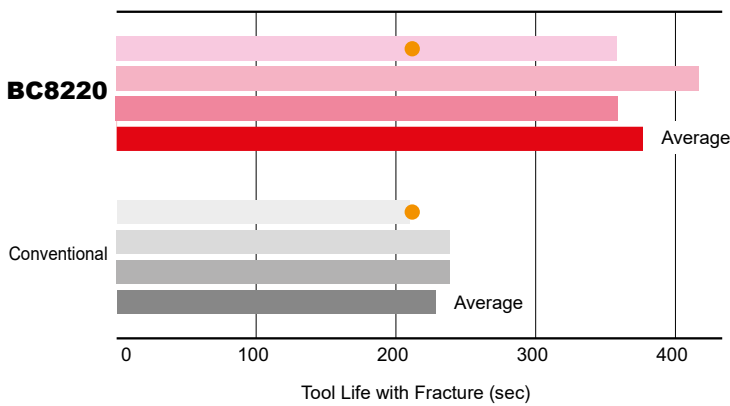
<Cutting Conditions>

Workpiece Material : JIS SCr420 (60 HRC)  
 Inserts : NP-CNGA120408GS2  
 Cutting Speed : Vc=160 m/min  
 Feed per Rev. : f=0.1 mm/rev  
 Depth of Cut : ap=0.2 mm  
 Cutting Mode : Dry Cutting

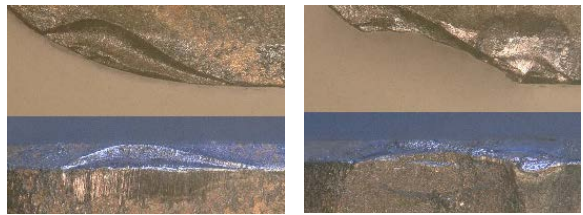
# BC8220 General Applications

## Machining SCr420 (60HRC): Comparison of Fracture Resistance During Medium Interrupted Cutting

Stable cutting is achieved with excellent fracture resistance during medium interrupted cutting.



After machining 210 seconds



BC8220

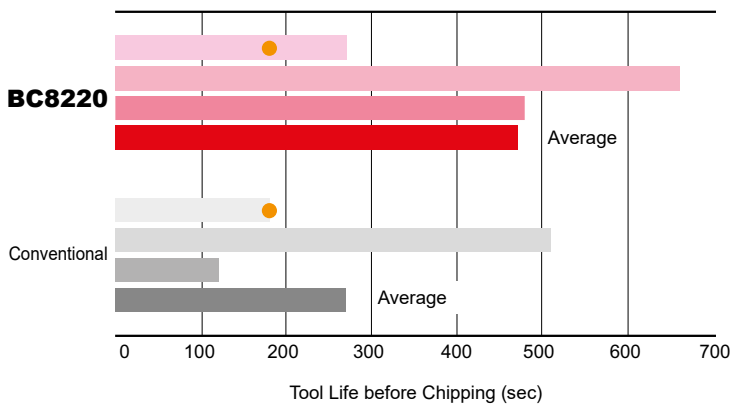
Conventional

<Cutting Conditions>

- Workpiece Material : JIS SCr420 (60 HRC)
- Inserts : NP-CNGA120408VA2
- Cutting Speed : Vc=250 m/min
- Feed per Rev. : f=0.15 mm/rev
- Depth of Cut : ap=0.1 mm
- Cutting Mode : Dry Cutting

## Machining SCr420(60HRC): Comparison of Fracture Resistance During Heavy Interrupted Cutting

Achieves excellent chipping resistance during heavy interrupted cutting.



After machining 180 seconds



BC8220

Conventional Product is Chipping

<Cutting Conditions>

- Workpiece Material : JIS SCr420 (60 HRC)
- Inserts : NP-CNGA120408VA2
- Cutting Speed : Vc=200 m/min
- Feed per Rev. : f=0.05 mm/rev
- Depth of Cut : ap=0.1 mm
- Cutting Mode : Wet Cutting

# COATED PCBN SERIES

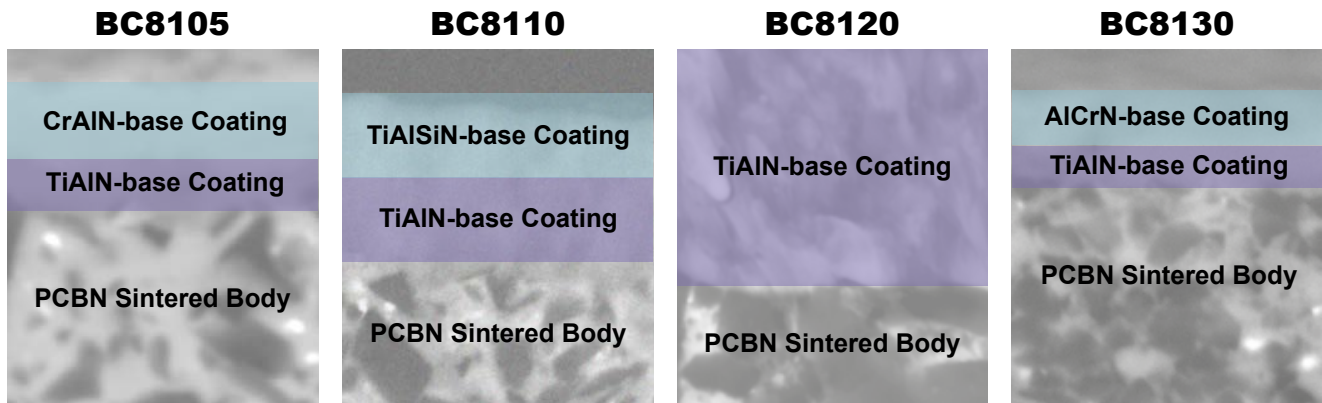
## BC8100 series for machining of hardened steel

### FEATURES

The coated PCBN grade BC8100 series and non-coated PCBN grade MB8100 series for cutting of hardened steel uses a newly developed optimized substrate technology for the PCBN base material. The new ultra-micro-binder prevents sudden fracturing and gives longer tool life. The BC8100 series coating exhibits excellent fracture resistance and wear resistance by using a special PVD coating suitable for each cutting mode.

B

#### ■ With a Newly Developed Special Ceramic PVD Coating



Offers excellent surface finishes. Peeling resistance and adhesion strength are improved by having both high lubricity and wear resistance.

Chipping caused by built up edge is prevented with improved welding resistance. Improved wear and adhesion strength to the PCBN surface.

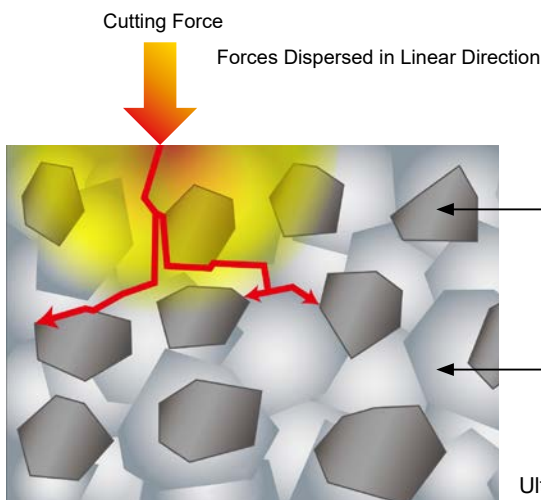
Chipping caused by a built up edge is prevented with improved welding resistance. Improved adhesion to the coating to the CBN surface enhances peeling resistance. The PCBN also has improved toughness by adopting new binder and sintering method.

Peeling caused by severe impact and chipping are prevented with high fracture resistance. Improved adhesion strength to the PCBN surface.

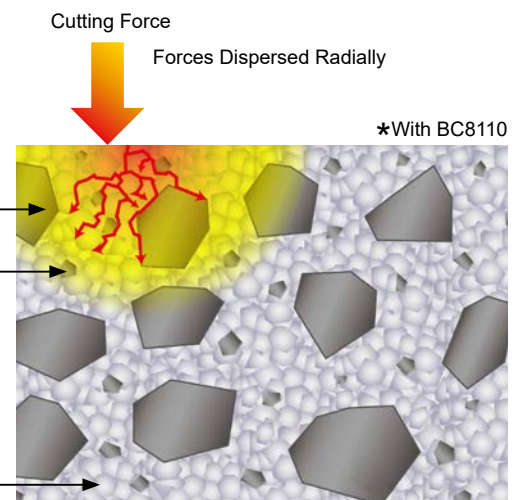
\*Graphical representation.

#### ■ Ultra Micro-Particle Binder Prevents Sudden Fractures

##### ● Conventional



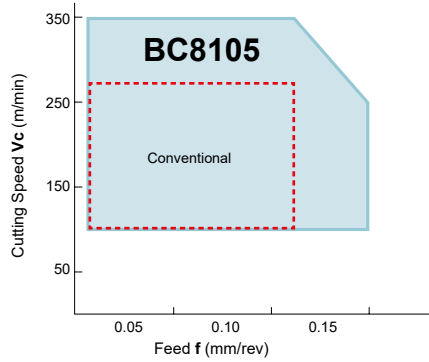
##### ● BC8100 Series BC8200 Series



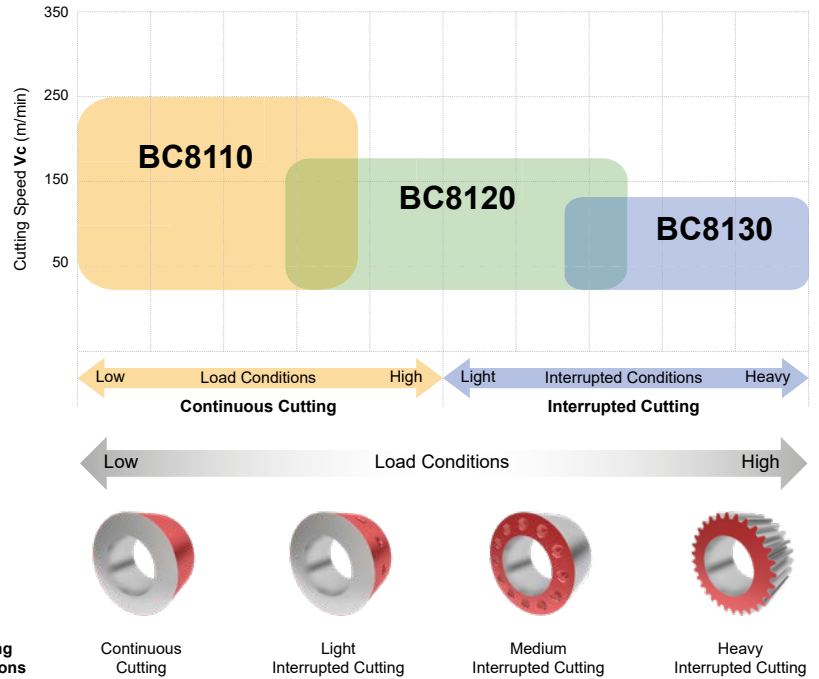
The ultra micro-particle binder prevents linear crack development to avoid sudden fracturing.



## Application range



\*BC8110 is recommended to improve wear resistance.



B

## Recommended cutting conditions

Grade	Cutting mode	Cutting Speed $V_c$ (m/min)				Feed $f$ (mm/rev)	Depth of Cut $a_p$ (mm)	Cutting Mode	
		50	150	250	350				
BC8100 Series	BC8105	Continuous	[Red bar from ~120 to ~280]				$\leq 0.15$	$\leq 0.2$	Dry, Wet
	BC8110	Continuous	[Red bar from ~120 to ~250]				$\leq 0.20$	$\leq 0.35$	Dry, Wet
	BC8120	Continuous	[Red bar from ~120 to ~220]				$\leq 0.3$	$\leq 0.5$	Dry, Wet
	BC8120	Interrupted	[Red bar from ~100 to ~200]				$\leq 0.2$	$\leq 0.3$	Dry, Wet
	BC8130	Interrupted	[Red bar from ~100 to ~150]				$\leq 0.20$	$\leq 0.30$	Dry, Wet

# COATED PCBN SERIES

## BC8100 Series

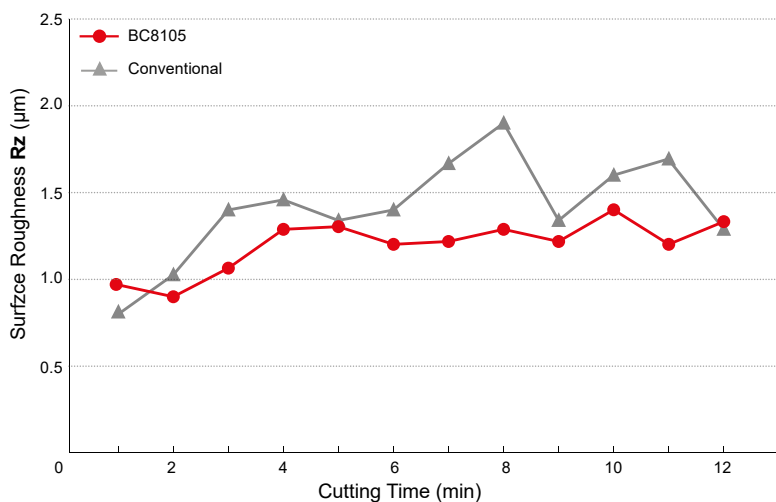
■ Cutting example and application example

### BC8105 Highest Accuracy

B

Use of a PCBN substrate with excellent wear resistance and chipping resistance, together with a high-lubricity coating film, controls the occurrence of boundary wear and exhibits outstanding surface roughness.

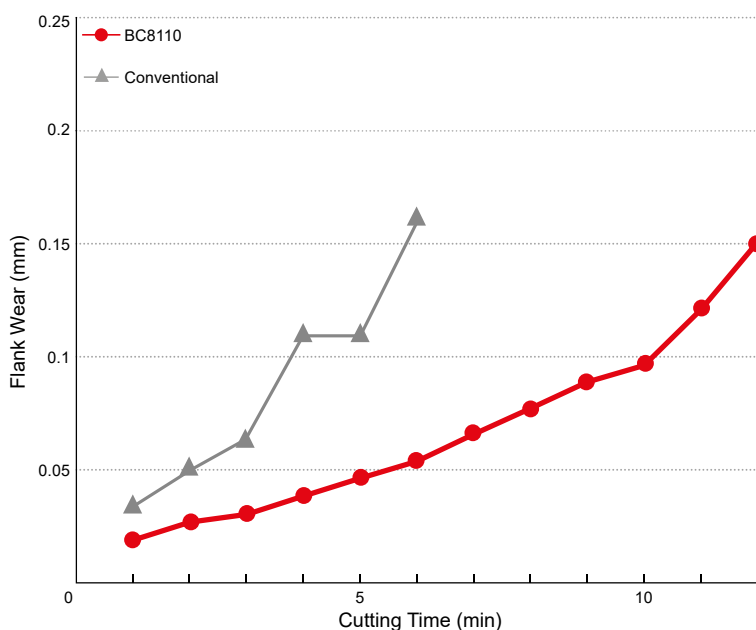
Suitable for finishing with surface roughness Ra 0.6 μm or Rz 2.4 μm or less.



Insert	NP-CNGA120408GS2
Work Material	JIS SCr420 (60HRC)
Machining Methods	External Continuous Cutting
Cutting Speed Vc (m/min)	200
Feed f (mm/rev)	0.05
Depth of Cut ap (mm)	0.05
Cutting Mode	Dry Cutting

### BC8110 High Speed Turning

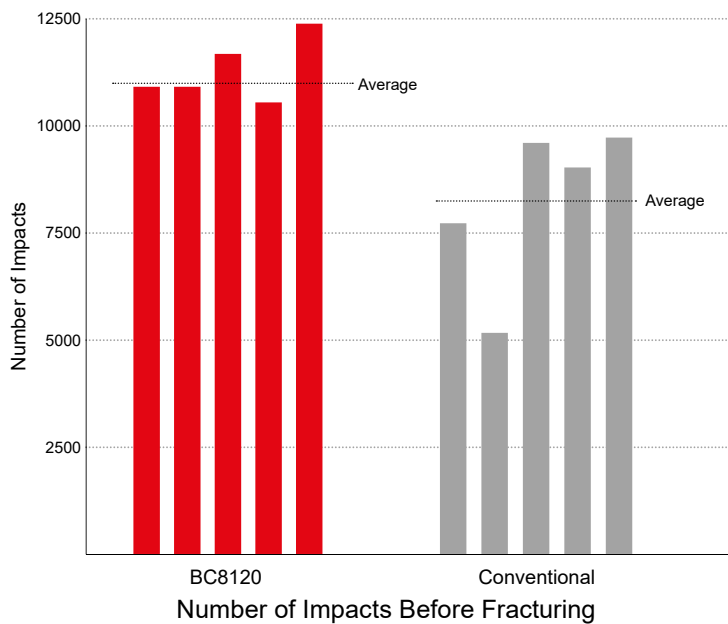
Use of a CBN substrate with excellent wear resistance and chipping resistance, together with an extremely hard coating film, provides the highest flank wear resistance of the entire BC81 series.



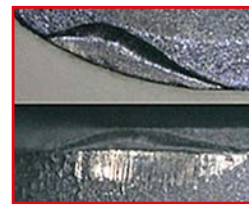
Insert	NP-CNGA120408GS2
Work Material	JIS SCr420 (60HRC)
Machining Methods	External Continuous Cutting
Cutting Speed Vc (m/min)	250
Feed f (mm/rev)	0.10
Depth of Cut ap (mm)	0.2
Cutting Mode	Dry Cutting

# BC8120 General Application

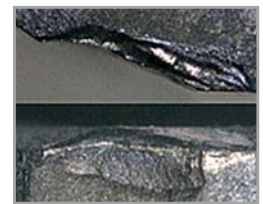
Use of a CBN substrate with excellent fracture resistance and crater wear resistance, together with a coating film having superior wear resistance, combines both fracture resistance and wear resistance while exhibiting outstanding crater wear resistance.



Cutting edge condition after 8000 impacts



BC8120

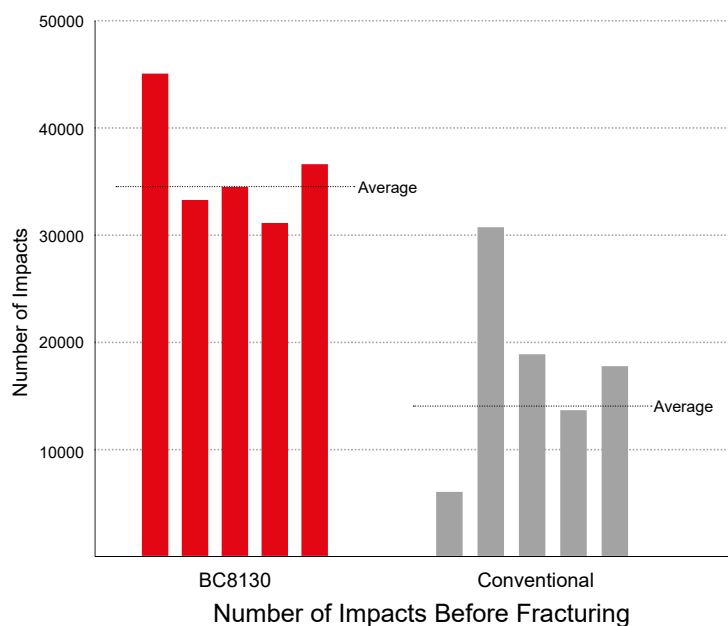


Conventional

Insert	NP-CNGA120408GA2
Work Material	JIS SCr420 (60HRC)
Machining Methods	External Interrupted Cutting
Cutting Speed $V_c$ (m/min)	250
Feed $f$ (mm/rev)	0.15
Depth of Cut $a_p$ (mm)	0.1
Cutting Mode	Dry Cutting

# BC8130 Tough Machining

Use of a CBN substrate with excellent cutting edge strength, together with a coating film that combines hardness with impact resistance, allows it to exhibit outstanding cutting edge strength and fracture resistance.



Insert	NP-CNGA120408GA2
Work Material	JIS SCr420 (60HRC)
Machining Methods	External Heavy Interrupted Cutting
Cutting Speed $V_c$ (m/min)	250
Feed $f$ (mm/rev)	0.05
Depth of Cut $a_p$ (mm)	0.1
Cutting Mode	Wet Cutting

# NON-COATED PCBN SERIES

## MB8100 series for machining of hardened steel

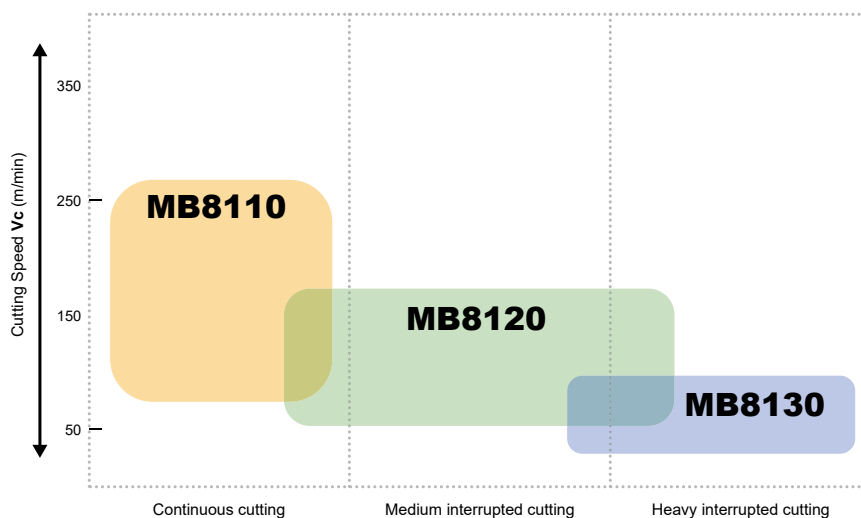
### FEATURES

The MB8100 series PCBN base material uses the optimized substrate technology (see B010) applied to the BC8100 series to prevent sudden defects during cutting and achieves long tool life.

The MB8100 series includes MB8110 for continuous cutting, MB8120 for general cutting and MB8130 for interrupted cutting and can be used over a very wide range of applications.

B

### Application range



### Recommended cutting conditions

Grade	Cutting mode	Cutting Speed Vc (m/min)					Feed f (mm/rev)	Depth of Cut ap (mm)	Cutting Mode
		50	100	150	200	250			
MB8110	Continuous			150 - 225			≤0.2	≤0.3	Dry, Wet
MB8120	Continuous			150 - 200			≤0.2	≤0.5	Dry, Wet
	Interrupted			100 - 150			≤0.2	≤0.3	Dry, Wet
MB8130	Interrupted			75 - 125			≤0.2	≤0.3	Dry, Wet

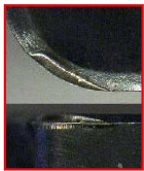
## ■ Application example

# MB8110 Continuous cutting

## Tool Life (Flank Wear)

Insert	NP-CNGA120408GA2
Work Material	JIS SCr420 (60HRC)
Machining Methods	External Continuous Cutting
Cutting Speed Vc (m/min)	250
Feed f (mm/rev)	0.1
Depth of Cut ap (mm)	0.2
Cutting Mode	Dry Cutting

### Cutting Edge after 180 sec.

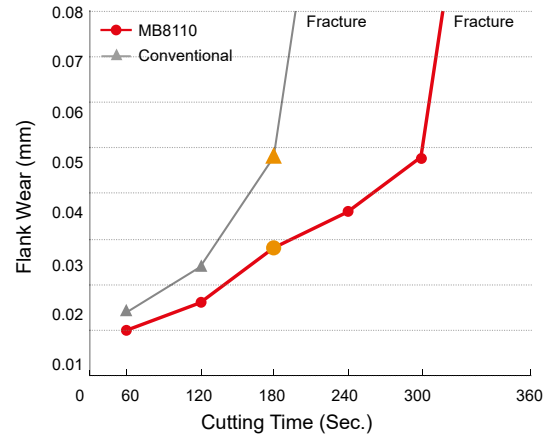


MB8110



Conventional

Large Wear



# MB8120 General Application

## Test of Interrupted Cutting

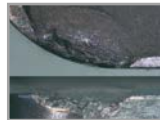
Insert	NP-CNGA120408GA2
Work Material	JIS SCr420 (60HRC)
Machining Methods	External Interrupted Cutting
Cutting Speed Vc (m/min)	250
Feed f (mm/rev)	0.15
Depth of Cut ap (mm)	0.1
Cutting Mode	Dry Cutting

17000 Impacts

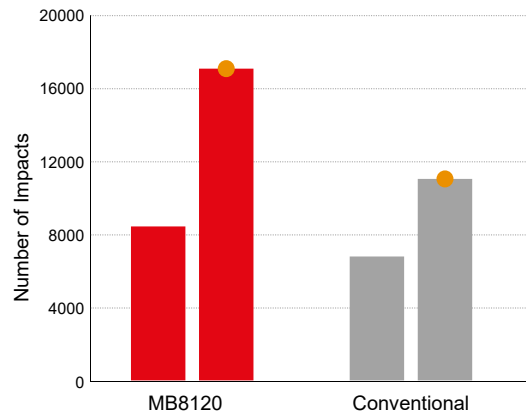


MB8120

11000 Impacts



Conventional



# MB8130 Interrupted cutting

## Test of Interrupted Cutting

Insert	NP-CNGA120408GA2
Work Material	JIS SCr420 (60HRC)
Machining Methods	External Heavy Interrupted Cutting
Cutting Speed Vc (m/min)	150
Feed f (mm/rev)	0.05
Depth of Cut ap (mm)	0.1
Cutting Mode	Wet Cutting

77000 Impacts

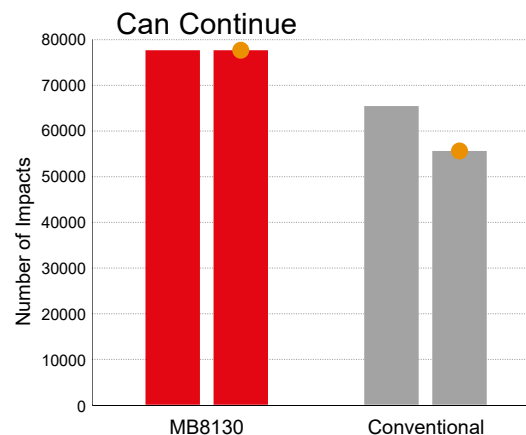


MB8130

54000 Impacts



Conventional



B

# PCBN

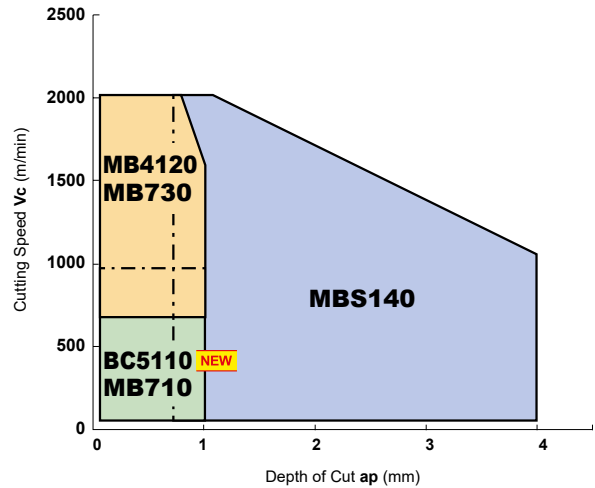
## Sintered Alloy Machining • Cast Iron Machining MB4120/BC5110/MB710/MB730/MBS140

### Application Range

#### ● Sintered Alloy Machining



#### ● Cast Iron Machining



### Recommended Cutting Conditions

#### ● Sintered Alloy Machining

Work Material	Application range	Grade	Cutting Speed Vc (m/min)					Feed f (mm/rev)	Depth of Cut ap (mm)	Cutting Mode
			100	150	200	250	300			
General Sintered Alloy	General Cutting	<b>MB4120</b>	[Bar chart showing Vc range from ~150 to 300 m/min]					≤0.2	≤0.3	Dry, Wet
High Density Sintered Alloy	General Cutting	<b>MB4120</b>	[Bar chart showing Vc range from ~100 to 200 m/min]					≤0.2	≤0.3	Dry, Wet
Sintered Alloy	General Cutting	<b>MB4120</b>	[Bar chart showing Vc range from ~100 to 150 m/min]					≤0.2	≤0.3	Dry, Wet

#### ● Cast Iron Machining

Work Material	Application range	Grade	Cutting Speed Vc (m/min)							Feed f (mm/rev)	Depth of Cut ap (mm)	Cutting Mode
			100	250	500	600	750	1000	1250			
Gray Cast Iron GG25, GG30	General Cutting	<b>MB4120</b>	[Bar chart showing Vc range from ~750 to 1250 m/min]							≤0.4	≤0.5	Dry, Wet
	General Cutting	<b>MB730</b>	[Bar chart showing Vc range from ~1000 to 1250 m/min]							≤0.5	≤1.0	Dry, Wet
	General Cutting	<b>MB710</b>	[Bar chart showing Vc range from ~500 to 1000 m/min]							≤0.5	≤1.0	Dry, Wet
	Low Cutting Speeds	<b>BC5110</b> <small>NEW</small>	[Bar chart showing Vc range from ~250 to 500 m/min]							≤0.5	≤0.5	Dry, Wet
	Heavy Cutting	<b>MBS140</b>	[Bar chart showing Vc range from ~500 to 1500 m/min]							≤0.5	≤5	Dry, Wet

# NON-COATED PCBN

## Sintered Alloy Machining • Cast Iron Machining MB4120

● The first recommendation that can be widely used for continuous to interrupted cutting of sintered alloy and cast iron.

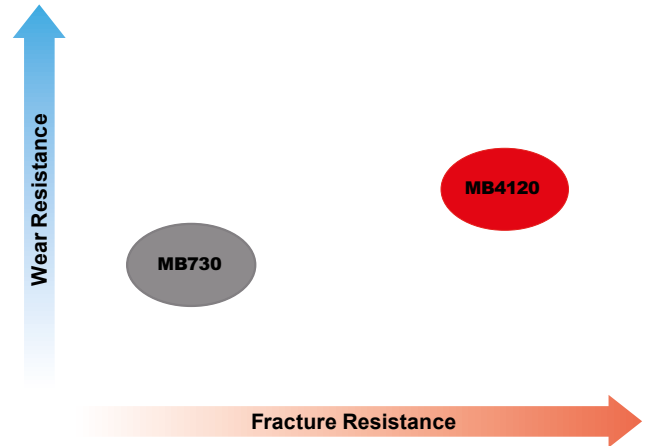
### FEATURES

#### High fracture resistance

Fine CBN particles increase cutting edge toughness. The high fracture resistance allows stable performance even during interrupted machining.

#### High adhesion strength of fine CBN particles

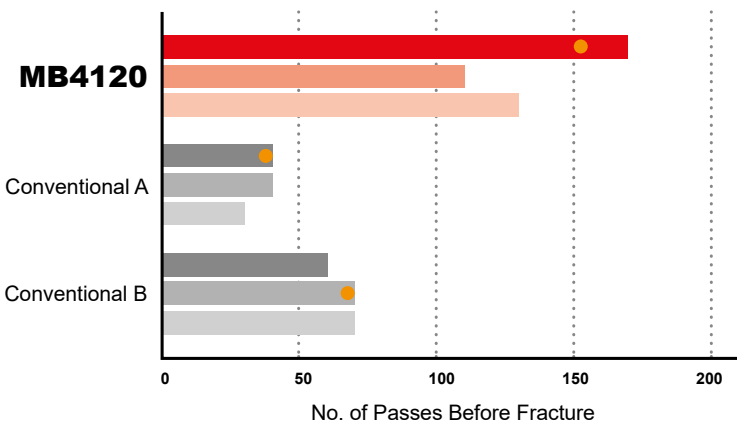
Optimization of the sintering conditions strengthens adhesion between the fine CBN particles. This increases both fracture resistance and wear resistance.



**B**

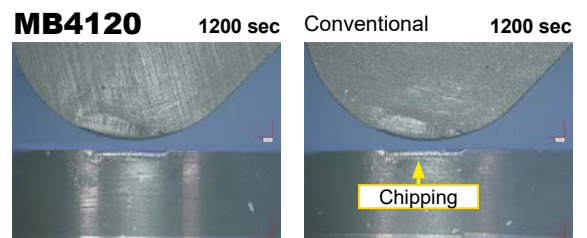
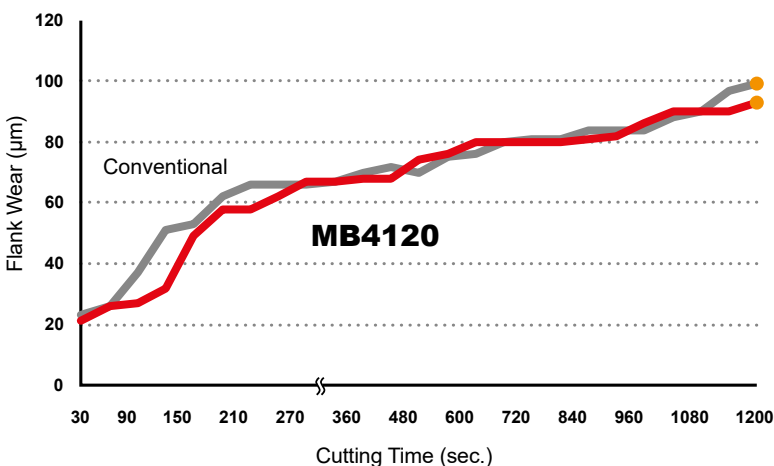
### Application Example

Fracture resistance comparison during interrupted facing of high strength sintered alloy



<Cutting Conditions>  
 Work Material : High Strength Sintered Alloy  
 Insert : NP-TNGA160408SE3  
 Cutting Speed : Vc=150 m/min  
 Feed : f=0.15 mm/rev  
 Depth of Cut : ap=0.1 mm  
 Cutting Mode : Wet Cutting

### Comparison of continuous machining of DIN GG25



<Cutting Conditions>  
 Work Material : DIN GG25 (Perlite)  
 Insert : NP-TNGA160408SF3  
 Cutting Speed : Vc=800 m/min  
 Feed : f=0.1 mm/rev  
 Depth of Cut : ap=0.2 mm  
 Cutting Mode : Dry Cutting

# COATED PCBN SERIES

## Cast Iron Machining **BC5110**

### FEATURES

BC5110 uses a tough substrate with a highly hard coating to provide excellent chipping and wear resistance.

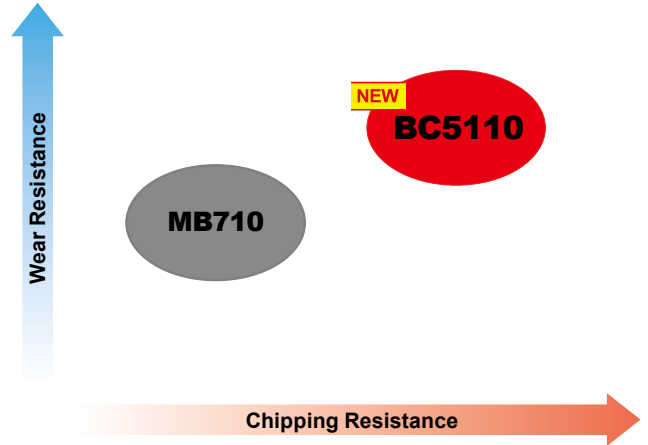
**B**

#### Excellent Chipping Resistance

Compared to conventional grades, the fine grain and high CBN content greatly improves chipping resistance and provides stability and long tool life.

#### Excellent Wear Resistance Coating

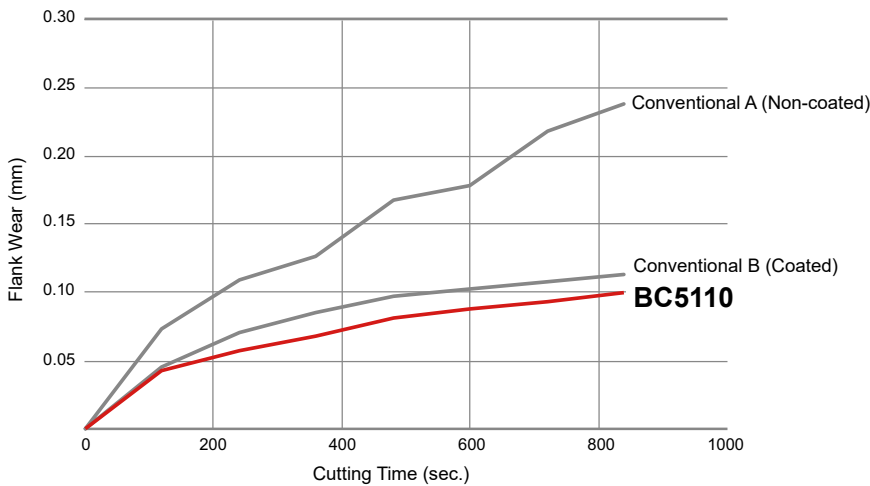
The hard ceramic coating layer provides excellent surface finishes as well as wear and notch resistance during continuous cutting. Additionally, chipping and peeling of the coating layer is suppressed due to the improved bonding strength to the CBN substrate.



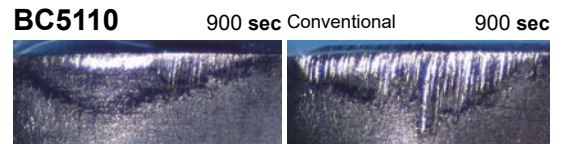
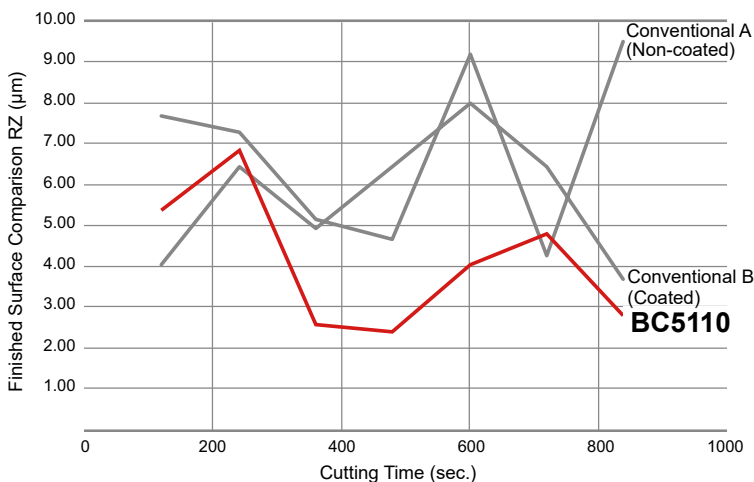
#### ■ Machining FC250 : comparing wear resistance and surface roughness.

The tough substrate and wear resistant coating of BC5110 provides good surface finishes when compared to conventional uncoated grades.

#### Flank Wear Comparison



#### Finished Surface Comparison



#### <Cutting Conditions>

Workpiece Material : JIS FC250  
 Inserts : CNGA120408  
 Machining Methods : External Continuous Cutting  
 Cutting Speed :  $V_c = 300$  m/min  
 Feed per Rev. :  $f_r = 0.1$  mm/rev  
 Depth of Cut :  $a_p = 0.2$  mm  
 Cutting Mode : Dry Cutting



# SOLID PCBN

## Cast Iron Machining MBS140

### FEATURES

#### Supports high-efficiency machining with large depths of cut.

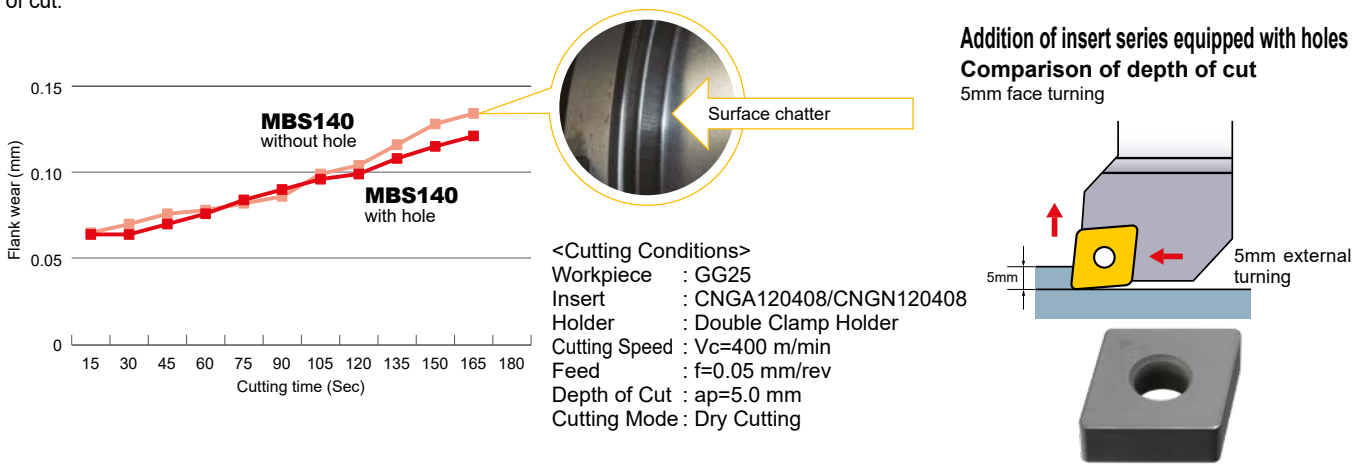
All inserts are solid PCBN sintered bodies, meaning there are no limits to the depths of cut.

Therefore, rough machining of cast iron, plus high-speed and high-efficiency machining, which is a characteristic of PCBN tools, can be achieved.

#### Combines wear resistance and fracture resistance

Use of micro-grain CBN with a newly-developed special binder provides high wear resistance.

Use of Mitsubishi Materials' original high-efficiency sintering technology provides high fracture resistance and supports machining at large depths of cut.



B

# PCBN

## FOR CYLINDER LINER MB5015

\*Produced to order only.

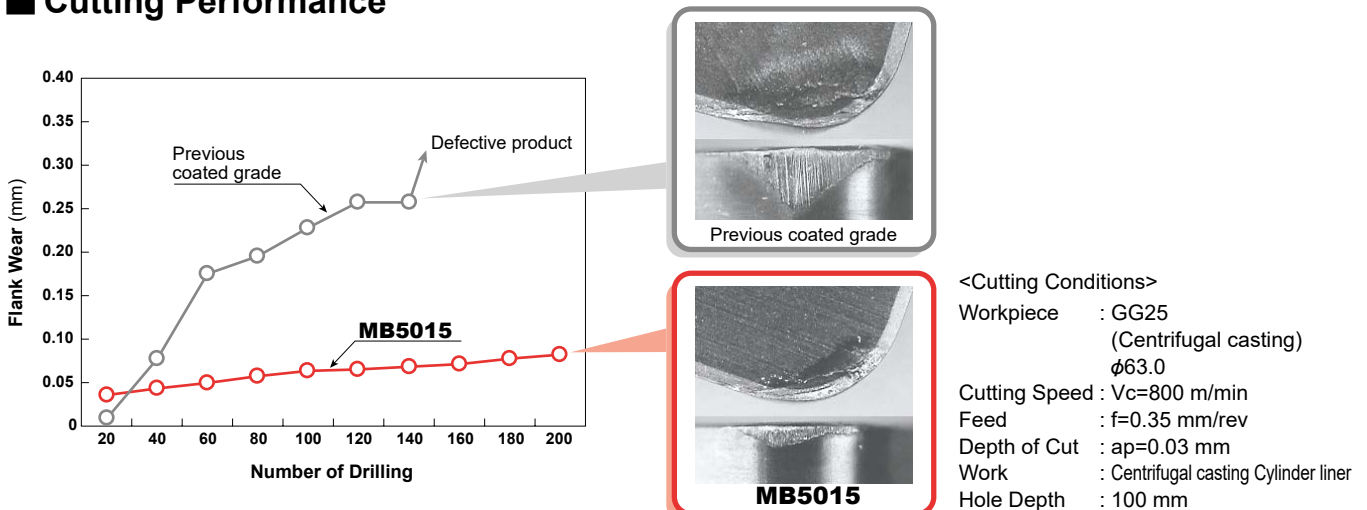
### FEATURES

**MB5015** is an exclusive grade with high wear resistance for boring of centrifugal casting cylinder liners in semi finishing or finishing applications.

#### Recommended Cutting Conditions

Work Material	Cutting Mode	Cutting Speed $V_c$ (m/min)				Feed $f$ (mm/rev)	Depth of Cut $a_p$ (mm)	Cutting Mode	
		100	500	1000	1500				
Centrifugal casting	Cast Iron	Continuous cutting	----- ----- ----- -----				-0.3(Finishing)	-0.05(Finishing)	Wet Cutting
			----- ----- ----- -----				-0.8(Semi-finishing)	-0.2(Semi-finishing)	

#### Cutting Performance



# PCBN

- Suitable for high speed finishing of heat treated steel, sintered ferrous alloy and cast iron.
- Low affinity to iron, thus good surface finishes are possible.
- Grinding operations can be replaced by machining.



## ● Heat Treated Steel

Work Material		Type	Cutting Mode	Recommended Grade	Recommended Cutting Conditions			Cutting Mode
					Cutting Speed Vc (m/min)	Feed f (mm/rev)	Depth of Cut ap (mm)	
Structural Steel Esp. Carburized Steel High Alloy Steel	35—65 HRC	Coated	High speed finishing cutting	<b>BC8105</b>	250 (100—350)	≤0.15	≤0.2	Dry,Wet
			Continuous cutting for general purpose	<b>NEW BC8210</b> <b>BC8110</b>	200 (100—300)	≤0.2	≤0.35	Dry,Wet
				<b>NEW BC8220</b> <b>BC8120</b>	200 (100—230)	≤0.3	≤0.8	Dry,Wet
			Medium interrupted cutting	<b>NEW BC8220</b> <b>BC8120</b>	150 (60—200)	≤0.2	≤0.3	Dry,Wet
		Non-coated	Interrupted cutting	<b>BC8130</b>	120 (60—150)	≤0.2	≤0.3	Dry,Wet
			Continuous cutting for general purpose	<b>NEW MB8110</b>	200 (100—250)	≤0.2	≤0.3	Dry,Wet
				<b>NEW MB8120</b>	150 (80—220)	≤0.2	≤0.5	Dry,Wet
			Medium interrupted cutting	<b>NEW MB8120</b>	130 (85—180)	≤0.2	≤0.3	Dry,Wet
Interrupted cutting	<b>NEW MB8130</b>	100 (60—150)	≤0.2	≤0.3	Dry,Wet			

## ● Cast Iron

Work Material		Workpiece Structure	Cutting Speed Vc (m/min)					Feed f (mm/rev)	Depth of Cut ap (mm)	Cutting Mode
			250	500	750	1000	1250			
Gray Cast Iron	<b>GG25</b>	Ferritic + Pearlitic	<b>MBS140</b>					-0.5	-1.0 MBS140/BC5110 -5.0	Dry,Wet
	<b>GG30</b>	Pearlitic	<b>NEW BC5110</b>	<b>MB710</b>	<b>MB730</b>					
Alloy Cast Iron		Pearlitic		<b>MB4120</b>			-0.4	-0.5	Dry,Wet	
Ductile Cast Iron	<b>GGG40</b>	Ferritic	<b>MB710</b>					-0.4	-0.5	Dry,Wet
	<b>GGG70</b>	Ferritic + Pearlitic Pearlitic	<b>MB730</b>							

## ● Sintered Alloy

Work Material	Recommended Grade	Recommended Cutting Conditions		
		Cutting Speed Vc (m/min)	Feed f (mm/rev)	Depth of Cut ap (mm)
General Sintered Alloy	<b>MB4120</b>	180 (80—300)	-0.2	-0.3
High Density Sintered Alloy	<b>MB4120</b>	150 (80—230)	-0.2	-0.3
Sintered Alloy	<b>MB4120</b>	130 (80—180)	-0.2	-0.3

## ● Valve Seat

Amount of Hard Particles	None or Small	←————→			Large
Hardness of Workpiece (HV)	150	250	300	350	
Plunge Cut	<b>MB4120</b>		<b>MB825</b>	<b>MB835</b>	
Traverse Cut	<b>MB4120</b>		<b>MB710</b>	<b>MB825</b>	

## ● Roll

Work Material	Grade	Recommended Cutting Conditions		
		Cutting Speed Vc (m/min)	Feed f (mm/rev)	Depth of Cut ap (mm)
Ductile Cast Iron Granular Cast Iron Chilled Cast Iron	<b>MB710</b>	80 (30—130)	0.3 (0.1—0.5)	0.2—3.0
High Speed Steel	<b>MB730</b>	50 (20—70)	0.25 (0.1—0.4)	0.1—3.0
Cemented Carbide	<b>MB730, MBS140</b>	20 (10—30)	-0.2	-0.2

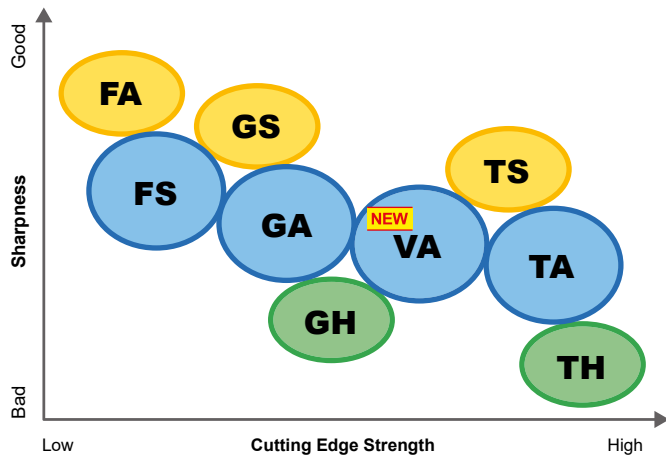
## ● Heat Resistant Alloy

Work Material	Grade	Recommended Cutting Conditions		
		Cutting Speed Vc (m/min)	Feed f (mm/rev)	Depth of Cut ap (mm)
Ni Base Heat Resistant Alloy (e.g. Inconel)	<b>MB730</b>	120 (100—150)	-0.2	-0.5
Co Base Heat Resistant Alloy (e.g. Stellite)	<b>MB730</b>	70 (50—100)	-0.2	-0.5

B

# HONING

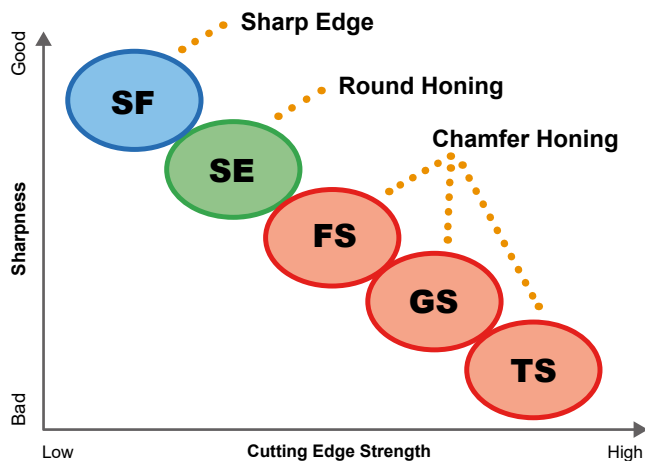
## ■ Honing for machining hardened steel



- **General cutting**
  - GA Honing : General machining
  - GS Honing : Vibration and burr control
  - GH Honing : For depths of cut of 0.15 or bigger
- **General cutting (For Fracture Resistance)**
  - VA Honing : High speeds and feed
- **Continuous cutting, stable cutting**
  - FS Honing : General machining
  - FA Honing : For improved initial cutting compared to FS
- **Medium and heavy interrupted cutting, unstable cutting**
  - TA Honing : General machining
  - TS Honing : Vibration and burr control
  - TH Honing : For depths of cut of 0.15 mm or larger

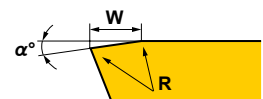
B

## ■ Honing for machining sintered alloys



- **Continuous cutting, stable cutting**
  - FS Honing : Continuous cutting, General machining
- **Medium and heavy interrupted cutting, unstable cutting**
  - GS, TS Honing : If fracturing occurs at the cutting edge during interrupted cutting
- **High precision cutting**
  - SF Honing : Improve surface roughness
  - SE Honing : Chipping control

# NP-CNGA120408-**G** **A** 2



Main Application Edge Honing Type

(mm)

	A			S			H			F			E		
	General			Vibration and burr control			High efficiency			High accuracy			Chipping control		
	$\alpha$	W	R	$\alpha$	W	R	$\alpha$	W	R	$\alpha$	W	R	$\alpha$	W	R
<b>F</b> Continuous cutting	15°	0.1	0	15°	0.1	0.015	—	—	—	—	—	—	—	—	—
<b>G</b> General cutting	25°	0.13	0.03	25°	0.13	0.015	25°	0.27	0.03	—	—	—	—	—	—
<b>V</b> For High Speed, High Feed Cutting	30°	0.13	0.04	—	—	—	—	—	—	—	—	—	—	—	—
<b>T</b> Interrupted cutting	35°	0.13	0.03	35°	0.13	0.015	35°	0.27	0.03	—	—	—	—	—	—
<b>S</b> High precision cutting	—	—	—	—	—	—	—	—	—	0	0	0	0	0	0.01

Conventional honing shapes  
**F** honing : 0.1mm×15°+R0  
**G** honing : 0.13mm×25°+R0.03  
**T** honing : 0.13mm×35°+R0.03

# PCBN BREAKER INSERT

## FEATURES

### Chipbreaker Geometry Designed for Excellent Chip Control

Radial chipbreaker ensures optimization of the cutting point and the chipbreaker position.

Enables effective chip discharge even when copy machining and prevents the chips from wrapping around the holder under finish cutting conditions.

### Long Life Coated PCBN Grade

Combination of coating grade & breaker, high efficiency and long tool life over a wide variety of applications.

B

## ■ Chipbreaker

### ● BM Breaker (High depth of cut)

Good for high depth cutting of carburized layer.

Recommend under  $a_p=0.6$  mm

★Available in BC8120 & BC8220 grade.

### ● BF Breaker (Light cutting depth)

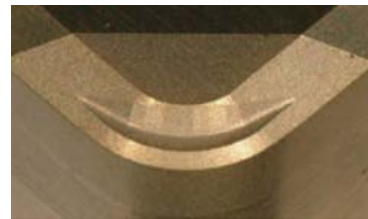
Good for chip removal under light depth and feed cutting.

Recommend under  $a_p=0.3$  mm

★Available in BC8120 & BC8220 grade.

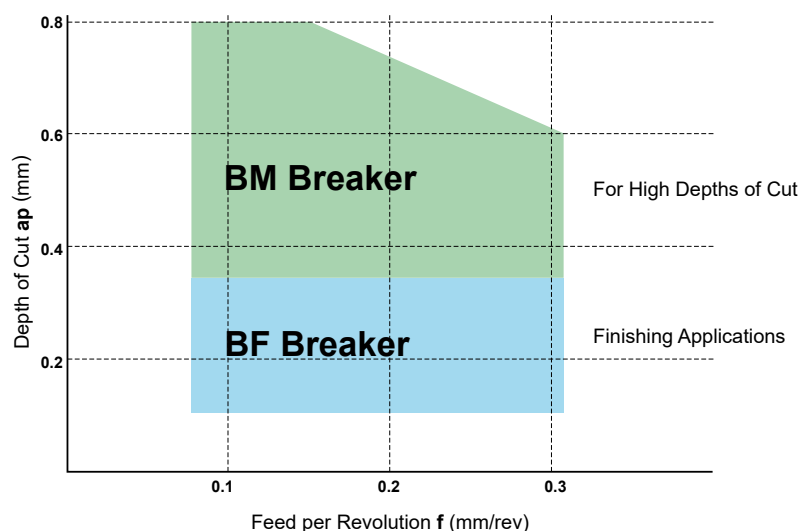


**BM Breaker**

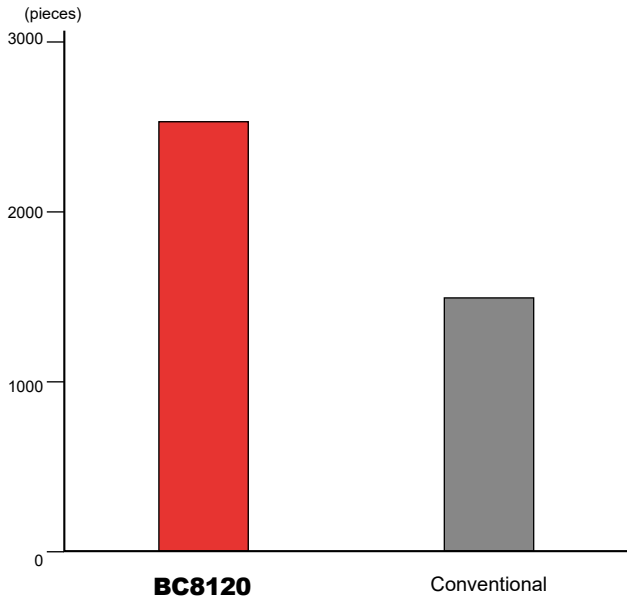


**BF Breaker**

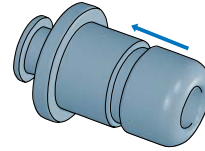
## ■ Application Area



## Application Example

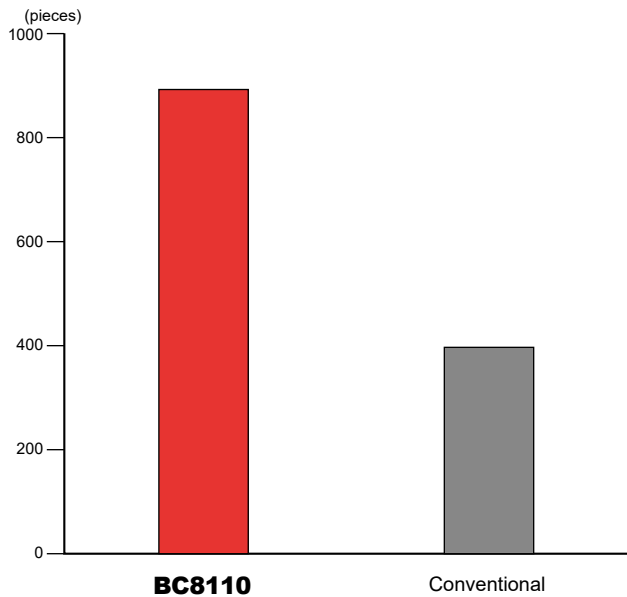


BC8120 achieved 1.5X longer tool life.

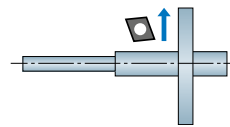


<Cutting Conditions>  
 Workpiece : 42CrMoS4 (56-59HRC)  
 Component : Counter shaft  
 (External interrupted cutting)  
 Insert : BM-DNGM150608TA2  
 Cutting Speed :  $V_c=170$  m/min  
 Feed :  $f=0.15$  mm/rev  
 Depth of Cut :  $a_p=0.07-0.10$  mm  
 Cutting Mode : Dry Cutting

B



BC8110 achieved 1.3X longer tool life.



<Cutting Conditions>  
 Workpiece : Alloy steel (61-65HRC)  
 Component : Counter shaft  
 (Continuous facing)  
 Insert : BF-DNGM150404TA2  
 Cutting Speed :  $V_c=150$  m/min  
 Feed :  $f=0.12$  mm/rev  
 Depth of Cut :  $a_p=0.15$  mm  
 Cutting Mode : Wet Cutting

# MULTI-CORNER TYPE INSERTS

● A single sided, multi-corner type insert has no cutting edges on the underside.

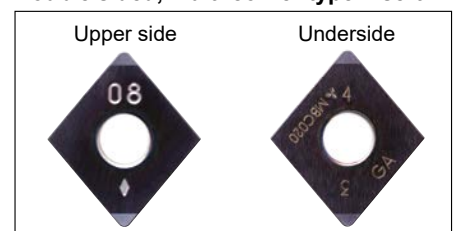
Double Sided, multi-corner type insert, ex.

**NP-CNGA120408GA4**  
 No. of Cutting Edge Corners

Single Sided, multi-corner type insert, ex.

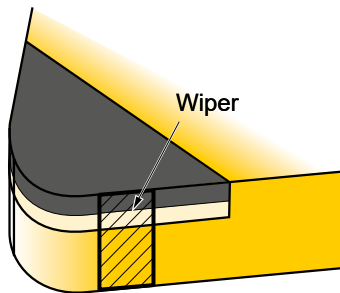
**NP-CNGA120408GA2**  
 No. of Cutting Edge Corners

Double sided, multi-corner type insert



# WIPER INSERT

## FEATURES



B

### Improving Surface Finish

Under the same machining conditions as conventional breakers, but with the feed rate increased, the surface finish of the workpiece can be improved.

### Improving Efficiency

High feed rates not only shorten machining times but also make it possible to combine roughing and finishing operations.

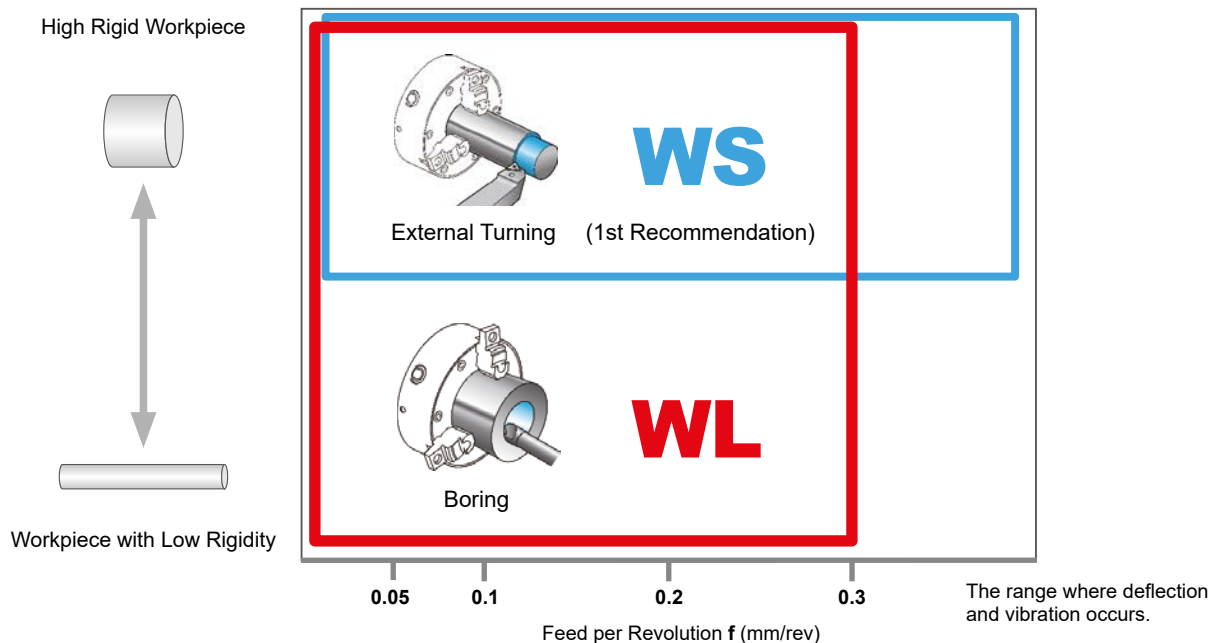
### Increased Tool Life

When using high feed conditions, the time required to cut one component is decreased, thus more parts can be machined with each insert. In addition, the high feed rate prevents rubbing, therefore, delaying the progression of wear and increasing tool life of the insert.

### Improving Chip Control

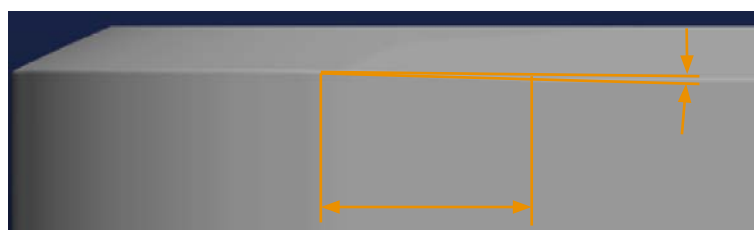
Under high feed conditions, the chips generated become thicker and are more easily broken, thus, chip control is improved.

## Application of Wiper Inserts



## WL Wiper Insert

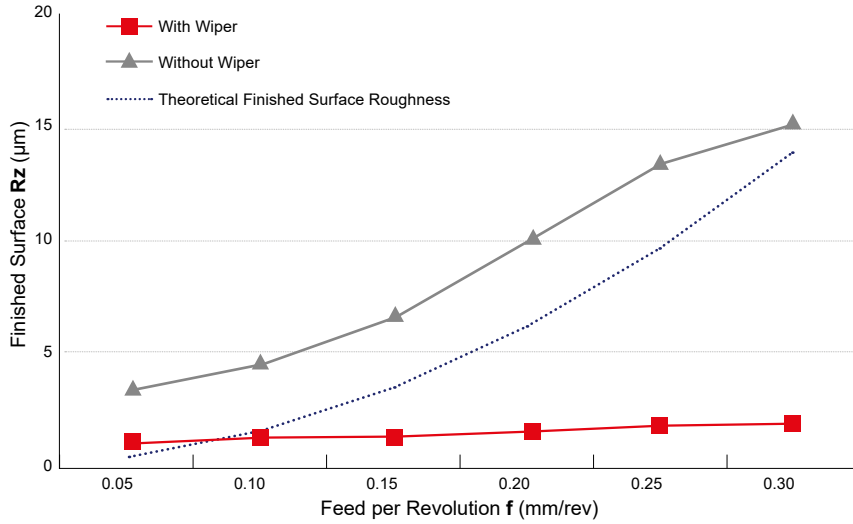
Preventing the cutting edge from vibration during boring and turning of small diameter workpieces as well as providing excellent surface finish roughness.



Applying a slight slope on the wiper cutting edge reduces cutting resistance.

## Cutting Performance

### WS Wiper (External Turning)

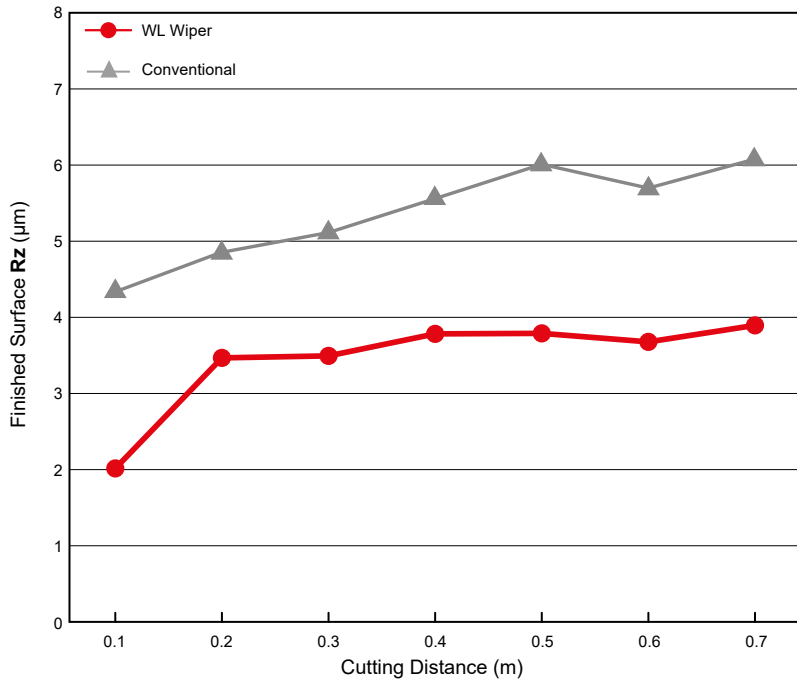


#### <Cutting Conditions>

Work Material : Hardened Steel (60HRC)  
 Insert : NP-CNGA120408  
 Machining Methods : Continuous  
 Cutting Speed :  $V_c = 120 \text{ m/min}$   
 Depth of Cut :  $a_p = 0.1 \text{ mm}$   
 Cutting Mode : Dry Cutting

B

### WL Wiper (Boring)



#### <Cutting Conditions>

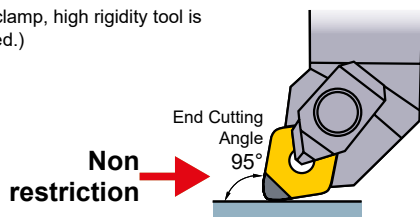
Work Material : JIS SCr415 (60HRC)  
 Insert : NP-CNGA120408FBWL2  
 Machining Methods : Continuous  
 Cutting Speed :  $V_c = 160 \text{ m/min}$   
 Feed :  $f = 0.3 \text{ mm/rev}$   
 Depth of Cut :  $a_p = 0.1 \text{ mm}$   
 Cutting Mode : Dry Cutting

A good surface finish is maintained even during unstable machining.

## Notes for Use

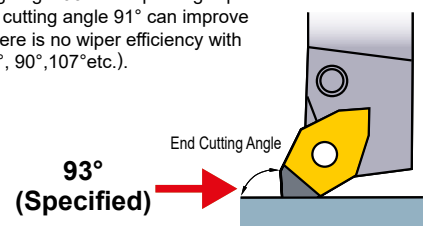
### No Restriction for Holders

A standard holder can be used.  
 (\*A double clamp, high rigidity tool is recommended.)



### Restriction for Holders

Use a holder with end cutting angle  $93^\circ$  for improving wiper efficiency. A holder with end cutting angle  $91^\circ$  can improve wiper efficiency, however, there is no wiper efficiency with other end cutting angles ( $60^\circ$ ,  $90^\circ$ ,  $107^\circ$  etc.).

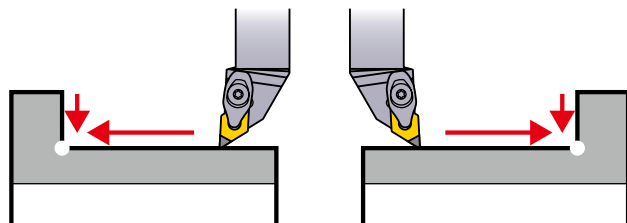


# Combination of BF Breaker and WS Wiper Insert

CNGM and DNGM types are now available with new inserts that combine a BF chipbreaker with a WS wiper insert. (BC8210 : BF-○NGM○○○○○○○TSWS2, BC8220 : BF-○NGM○○○○○○○TAWS2)  
It is effective for chip control and improvement of finished surface roughness without worrying about the hand of the tool even when continuous external or internal turning and facing.

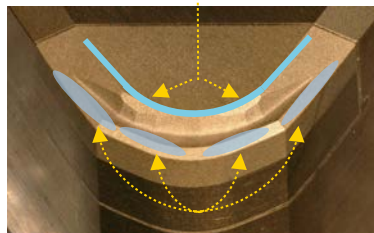
B

Effect of Chipbreaker and Wiper Insert



Demonstrates the effects of breaker and wiper insert in both right and left handed cutting.

BF Chipbreaker



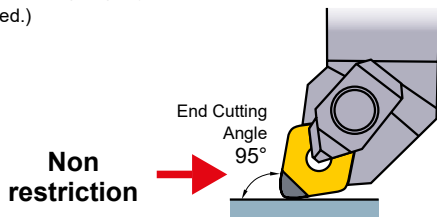
WS Wiper Insert (Neutral)

## Notes for Use

### When using CNGM type

#### No Restriction for Holders

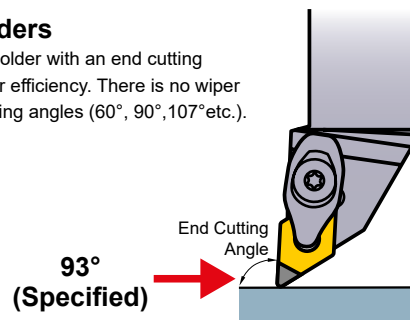
A standard holder can be used.  
(\*A double clamp, high rigidity tool is recommended.)



### When using DNGM type

#### Restriction for Holders

Use PDJN holder or DDJN holder with an end cutting angle 93° for improving wiper efficiency. There is no wiper efficiency with other end cutting angles (60°, 90°, 107° etc.).



## IDENTIFICATION

**BF** -CNGM120408 **TA** **WS** 2 **\_\_**

Insert Geometry	
BM	With Breaker
BF	With Breaker
NP	New Petit Cut

Edge Preparation	
Symbol	Application
FS	Continuous Cutting
GS GA GH	General Cutting
VA	For High Speed, High Feed Cutting
TS TA TH	Interrupted Cutting

Wiper	
WS	For High Rigidity Workpiece Material
No Mark	Without Wiper

Cutting Direction		
Symbol	Hand	Figure
JR	Right	
JL	Left	
No Mark	Neutral	



# PCBN GROOVING SERIES (GY/MG)

## FEATURES

**A combination with a high rigidity holder ensures high accuracy and long tool life.**

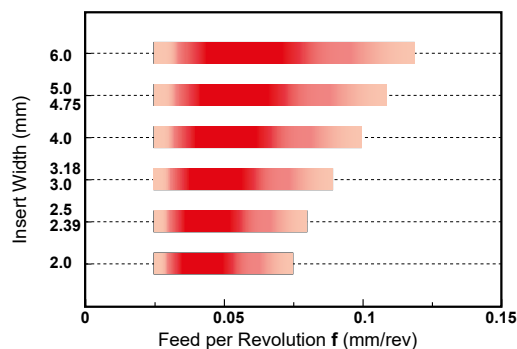
Holder rigidity is essential when grooving hardened steel. The GY series TriForce system offers high rigidity equivalent to a solid type tool. MG has a wide insert location face for high gripping force. The insert and holder combination allows delivery of excellent performance when grooving hardened steel.

**BC8110 coated materials for continuous machining of hardened steel have been added to GY inserts.**

BC8110 materials with excellent wear resistance have been added. Compared to conventional materials, they display excellent wear resistance to achieve long tool life. A blade width of 6 mm has also been added to the lineup of BC8110.



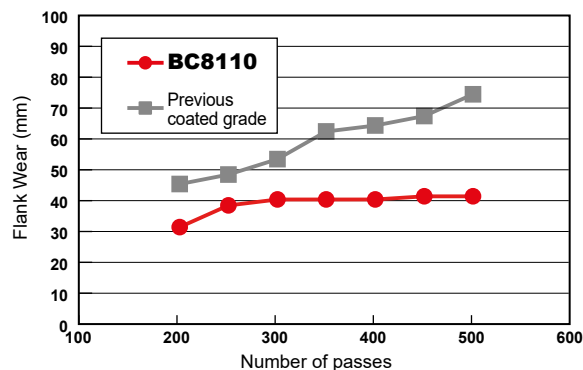
### Recommended Cutting Conditions



Work Material	Hardness	Grade	Cutting Speed Vc (m/min)	Cutting Mode
H Hardened Steel	35—65HRC	BC8110	100 (60—120)	Dry, Wet

### Cutting Performance

Tool life evaluation for the GY holder



<Cutting Conditions>

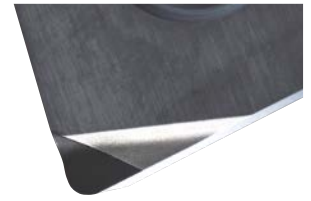
Insert : GY1G0200D020N-GFGS  
 Workpiece : JIS SG420 (60HRC)  
 Cutting Speed : Vc=120 m/min  
 Feed : f=0.1 mm/rev  
 Depth of Cut : ap=0.3 mm  
 Cutting Mode : Dry Cutting

### Application Example

Insert	GY1G0300F020N-GFGS (Grade : BC8110)	
Workpiece	<p>Alloy steel (58—62HRC)</p>	
Component	Input shaft	
Cutting Conditions	Cutting Speed Vc (m/min)	130
	Feed f (mm/rev)	0.1
Result	<p>BC8110: ~600 pieces              Conventional coated grade: ~250 pieces</p> <p>Tool life over twice as long as conventional products</p>	

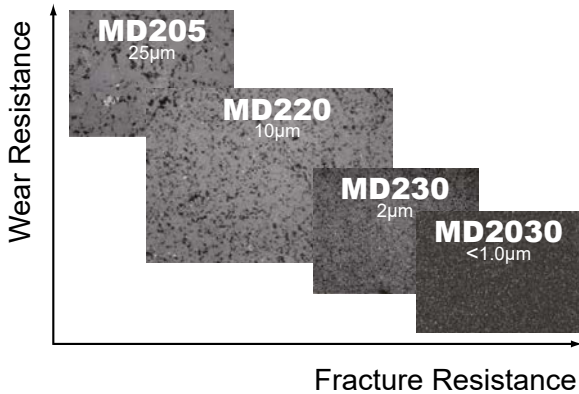
# PCD (SINTERED DIAMOND)

- Suitable for materials such as aluminium alloy, non-ferrous metals and fibre strengthened plastic.
- Suitable for extremely high speed finishing.



## FEATURES

B



Grade	Features
<b>MD205*</b>	<b>For Continuous Cutting</b> Coarse grain diamond particles are sintered and wear resistance is excellent. Use when wear resistance with MD220 is insufficient.
<b>MD220</b>	<b>Materials for general machining</b> Sintered medium grain diamond particles. Wear resistance and fracture resistance are superbly balanced. Applicable to general finishing of non-ferrous metals, non-metal cutting, and similar machining.
<b>MD230*</b>	<b>For Interrupted Cutting</b> Fine grain diamond particles are used. Fracture resistance and cutting edge sharpness are excellent. Use when fracture and a high quality finished surface is demanded with MD220.
<b>MD2030</b>	<b>For Heavy Interrupted Cutting</b> Strong sintering of ultra micro-grain PCD particles provides exceptional fracture resistance. Chipping during high-speed finish milling can be controlled.

\* MD205, MD230 : Non-Standard

## SELECTION STANDARD

### TURNING

Work Material	Recommended Grade			Recommended Cutting Conditions		
	MD205	MD220	MD2030	Cutting Speed Vc (m/min)	Feed f (mm/rev)	Depth of Cut ap (mm)
Aluminium Alloy (Si ≤ 12%)		◎	○	800 (200–1200)	–0.2	–1.0
Aluminium Alloy (Si > 13%)	◎	○		600 (200–1000)	–0.2	–1.0
Copper Alloy		◎		700 (200–1200)	–0.2	–1.0
Strengthened Plastic		◎		600 (100–1000)	–0.4	–1.0
Glass Fibre Reinforced Plastic		◎		500 (100–800)	–0.25	–1.0
Carbon	○	◎		400 (100–600)	–0.3	–1.0
Ceramics		○		50 (30–80)	–0.1	–1.0
Hard Rubber		◎		600 (300–800)	–0.15	–1.0
Wood Inorganic Board		◎		1300 (300–4000)	–0.4	–
Cemented Carbide	◎	○		15 (5–20)	–0.2	–0.5

Note 1) ◎ : 1st recommendation. ○ : 2nd recommendation  
Note 2) Not suitable for steel.

## PETIT CUT INSERT SERIES

- **Economical** The small PCD tip delivers long tool life.  
Eliminates the need for regrinding, making tool management easier and economical.
- **With Breaker** Chipbreaker formed directly on the PCD portion delivers superior chip control.
- Corner R0.05 mm inserts are available, making it suitable for the machining of small work corner radii.



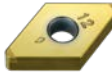














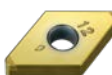



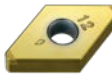





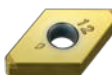



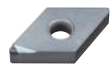



# Memo

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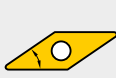






































































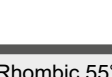


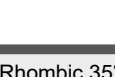








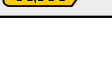




A series of horizontal dashed lines for writing.

# CLASSIFICATION

## NEGATIVE INSERTS WITH HOLE






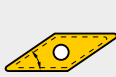


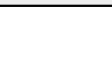















































Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°		
NEW PETIT CUT	Multi-corner Type Double Sided	G	Flat Top 	NP-CNGA_04  ↻ B036	NP-DNGA_04  ↻ B039		NP-TNGA_06  ↻ B044	NP-VNGA_04  ↻ B046	NP-WNGA_06  ↻ B048		
	Multi-corner Type Double Sided With Wiper		Flat Top 	NP-CNGA_0W04  ↻ B036							
	Multi-corner Type Single Sided		Flat Top 	NP-CNGA_02  ↻ B037	NP-DNGA_02  ↻ B040	NP-SNGA_02  ↻ B043	NP-TNGA_03  ↻ B044	NP-VNGA_02  ↻ B046	NP-WNGA_03  ↻ B048		
	Multi-corner Type Single Sided With Wiper		Flat Top 	NP-CNGA_0W02  ↻ B038	NP-DNGA_0WS2J_R/L  ↻ B042					NP-WNGA_0WS3  ↻ B048	
	Multi-corner Type Single Sided With Breaker		BF 	BF-CNGM_02  ↻ B038	BF-DNGM_02  ↻ B042						
	Multi-corner Type Single Sided With Breaker With Wiper		BF 	NEW BF-CNGM_0WS2  ↻ B038	NEW BF-DNGM_0WS2  ↻ B042						
	Multi-corner Type Single Sided With Breaker		BM 	BM-CNGM_02  ↻ B038	BM-DNGM_02  ↻ B042			BM-TNGM_03  ↻ B045			
	One-corner Type Single Sided With Breaker		R-F 	M	NP-CNMM_R-F  ↻ B064	NP-DNMM_R-F  ↻ B064	NP-SNMM_R-F  ↻ B065	NP-TNMM_R-F  ↻ B065	NP-VNMM_R-F  ↻ B066		

## NEGATIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
STANDARD	Multi-corner Type Double Sided (Solid PCBN)	G	<b>Flat Top</b> 	 <b>CNGA</b>                                     	     	     	     	     	     
	One-corner Type Single Sided	M	<b>Flat Top</b> 	     	     	     	     	     	
	One-corner Type Single Sided	G	<b>Flat Top</b> 	     	     	     	     	     	









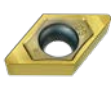






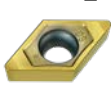


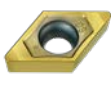














B

## 5° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-corner Type	G	<b>Flat Top</b> 	     	     	     	     	     	
	One-corner Type With Breaker	G	<b>R-F</b> 	     	     	     	     		

# CLASSIFICATION

## 7° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80° 	Rhombic 55° 	Square 90° 	Triangular 60° 	Rhombic 35° 	Trigon 80° 
NEW PETIT CUT	Multi-corner Type	G	<b>Flat Top</b> 	NP-CCGW/B_02  ↻ B051	NP-DCGW_02  ↻ B054		NP-TCGW_03  ↻ B056	NP-VCGW_02  ↻ B060	
	Multi-corner Type With Wiper	G	<b>Flat Top</b> 	NP-CCGW_0W02  ↻ B052					
	Multi-corner Type With Breaker	G	<b>BF</b> 	BF-CCGT_02  ↻ B052	BF-DCGT_02  ↻ B055				
	Multi-corner Type With Breaker	G	<b>BM</b> 	BM-CCGT_02  ↻ B052	BM-DCGT_02  ↻ B055				
	One-corner Type With Breaker	M	<b>Breaker</b> 	NP-CCMH  ↻ B067					
	One-corner Type	G	<b>Flat Top</b> 	NP-CCGW_0  ↻ B052	NP-DCGW_0  ↻ B055		NP-TCGW_0  ↻ B056		
	One-corner Type	M	<b>Flat Top</b> 						NP-WCMW_0  ↻ B060
	One-corner Type	M	<b>Flat Top</b> 	NP-CCMW  ↻ B067					
	One-corner Type With Breaker	M	<b>R/L-F</b> 		NP-DCMT_R/L-F  ↻ B068				
One-corner Type With Breaker	G	<b>R-F</b> 					NP-VCGT_R-F  ↻ B071		

B

## 7° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
STANDARD	One-corner Type	M	<b>Flat Top</b>	<b>CCMW</b>	<b>DCMW</b>		<b>TCMW</b> <b>TCGW</b>	<b>VCGW</b>	<b>WCMW</b>
		G		 ↻ B067	 ↻ B068		 ↻ B069	 ↻ B071	 ↻ B072



**B**

## 11° POSITIVE INSERTS WITH HOLE







Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-corner Type	G	<b>Flat Top</b>	<b>NP-CPGB_02</b>			<b>NP-TPGB_03</b>		
				 ↻ B053			 ↻ B057		
	One-corner Type With Breaker	M	<b>Breaker</b>	<b>NP-CPMH</b>					
				 ↻ B067					
One-corner Type With Breaker		<b>R/L-F</b>				<b>NP-TPMX_R/L-F</b>			
						 ↻ B070			
One-corner Type With Breaker		<b>R/L-F</b>				<b>NP-TPMH_R/L-F</b>			
						 ↻ B070			
STANDARD	One-corner Type With Breaker	G	<b>Breaker</b>	<b>CPGT</b>					<b>WPGT</b>
				 ↻ B067					 ↻ B072
	One-corner Type		<b>Flat Top</b>			<b>SPGX</b>	<b>TPGX</b>		
						 ↻ B068	 ↻ B070		

# CLASSIFICATION

## 15° POSITIVE INSERTS WITH HOLE












Type	Tolerance	Breaker Name and Cross Section	Rhombic 35°	
One-corner Type (For Aluminium With Breaker)	G	R-F 	VDGX_R-F  B074	

## 20° POSITIVE INSERTS WITH HOLE

Type	Tolerance	Breaker Name and Cross Section	Rhombic 55°	Triangular 60°
One-corner Type (For Aluminium With Breaker)	G	R/L 		TEGX_R/L  B073
One-corner Type (For Aluminium With Breaker)		R/L-F 	DEGX_R/L-F  B073	
One-corner Type (For Aluminium)		Flat Top 		TEGX  B073






## NEGATIVE INSERTS WITHOUT HOLE


Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Round
Multi-corner Type Double Sided (Solid PCBN)	G	<b>Flat Top</b>					
			<b>CNGN</b>  ↻ B049	<b>DNGN</b>  ↻ B049	<b>SNGN</b>  ↻ B050	<b>TNGN</b>  ↻ B050	<b>RNGN</b>  ↻ B049

B










## 5° POSITIVE INSERTS WITHOUT HOLE

Type	Tolerance	Breaker Name and Cross Section	Triangular 60°
Multi-corner Type	G	<b>Flat Top</b>	
			<b>TBGN</b>  ↻ B062

## SPECIAL PURPOSE INSERTS

Tool Holder Type	Tolerance	Inserts
<b>GY Type</b>	G	<b>GY_GFGS</b>  ↻ B063

## 11° POSITIVE INSERTS WITHOUT HOLE

Type	Tolerance	Breaker Name and Cross Section	Square 90°	Triangular 60°
Multi-corner Type	G	<b>Flat Top</b>		
			<b>NP-SPGN_02</b> <small>NEW</small>  ↻ B061	
One-corner Type	G	<b>Flat Top</b>		
			<b>SPGN</b>  ↻ B061, B075	<b>TPGN</b>  ↻ B062, B075

# PCBN TURNING INSERTS [NEGATIVE]

## 80° CN TYPE INSERTS WITH HOLE

PCBN

B

PCBN TURNING INSERTS

NEG

WITH HOLE

C

D

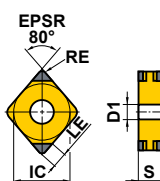
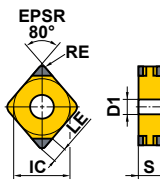
R

S

T

V

W

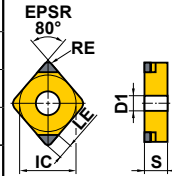
Work Material	H	Hardened Materials	Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting																		
	K	Cast Iron	Honing (Last letter of order number) : Please refer to page B021																		
	S	Heat-resistant Alloy, Titanium Alloy																			
Sintered Alloy		Coated PCBN					PCBN			Solid PCBN	Dimensions (mm)					Geometry	Applicable Holder Page				
Shape	Order Number	NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140			IC	S	RE	LE
NEW PETIT CUT	NP-CNGA120404GS4	●	●	●												12.7	4.76	0.4	1.8	5.16	 C008 C009 E015 E038 H006 -008
	NP-CNGA120408GS4	●	●	●												12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GS4	●	●	●												12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404GA4	●		●	●					★						12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408GA4	●		●	●					★						12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GA4	●		●	●					★						12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404GH4	★	★	★	★	●										12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408GH4	★	★	★	★	●										12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412GH4	●	★	★	★	●										12.7	4.76	1.2	2.2	5.16	
	<b>NEW NP-CNGA120404VA4</b>	●														12.7	4.76	0.4	1.8	5.16	
	<b>NEW NP-CNGA120408VA4</b>	●														12.7	4.76	0.8	2.0	5.16	
	<b>NEW NP-CNGA120412VA4</b>	●														12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404FS4	★	●	★	★					★						12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408FS4	★	●	★	★					★						12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412FS4	★	●	★	★					★						12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404TS4	★			★											12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408TS4	★			★											12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412TS4	★			★											12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404TA4	★		★	●					★	★					12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408TA4	●		●	●					★	★					12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412TA4	★		★	●					★	★					12.7	4.76	1.2	2.2	5.16	
	NP-CNGA120404TH4				★	●					★					12.7	4.76	0.4	1.8	5.16	
	NP-CNGA120408TH4	★		★	●						★					12.7	4.76	0.8	2.0	5.16	
	NP-CNGA120412TH4	★		★	●						★					12.7	4.76	1.2	2.2	5.16	
NEW PETIT CUT * (With Wiper)	NP-CNGA120404GSWS4	●	●	●											12.7	4.76	0.4	1.8	5.16	 C008 C009 E015 E038 H006 -008	
	NP-CNGA120408GSWS4	●	●	●											12.7	4.76	0.8	2.0	5.16		
	NP-CNGA120412GSWS4	●	●	●											12.7	4.76	1.2	2.2	5.16		
	NP-CNGA120404GAWS4	●		●	●					★					12.7	4.76	0.4	1.8	5.16		
	NP-CNGA120408GAWS4	●		●	●					★					12.7	4.76	0.8	2.0	5.16		
	NP-CNGA120412GAWS4	●		●	●					★					12.7	4.76	1.2	2.2	5.16		
	NP-CNGA120404FSWS4	●	★	★	★					★					12.7	4.76	0.4	1.8	5.16		
	NP-CNGA120408FSWS4	●	★	★	★					★					12.7	4.76	0.8	2.0	5.16		
	NP-CNGA120412FSWS4	●	★	★	★					★					12.7	4.76	1.2	2.2	5.16		

\* Please refer to B024 before using wiper inserts.

● = **NEW**

● : Inventory maintained. ★ : Inventory maintained in Japan.

Work Material	H	Hardened Materials	● ● ● ● ● ✱	● ● ● ✱	● ● ● ● ● ✱	● ● ● ● ● ✱	Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting Honing (Last letter of order number) : Please refer to page B021					Geometry	Applicable Holder Page										
	K	Cast Iron																					
Shape	S	Heat-resistant Alloy, Titanium Alloy	Coated PCBN			PCBN			Solid PCBN	Dimensions (mm)					Geometry	Applicable Holder Page							
		Sintered Alloy	NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	MB8120	MB8130	MB4120	MB710			MB730	MBS140	IC	S	RE	LE	D1
NEW PETIT CUT		NP-CNGA120402GS2	★		★											12.7	4.76	0.2	1.7	5.16			
		NP-CNGA120404GS2	●	● ●					★				● ● ●				12.7	4.76	0.4	1.8	5.16		
		NP-CNGA120408GS2	●	● ●					★				● ● ●				12.7	4.76	0.8	2.0	5.16		
		NP-CNGA120412GS2	●	● ●					★				● ● ●				12.7	4.76	1.2	2.2	5.16		
		NP-CNGA120402GA2	★		★					★							12.7	4.76	0.2	1.7	5.16		
		NP-CNGA120404GA2	●	● ●					★				● ● ●				12.7	4.76	0.4	1.8	5.16		
		NP-CNGA120408GA2	●	● ●					★				● ● ●				12.7	4.76	0.8	2.0	5.16		
		NP-CNGA120412GA2	●	● ●					★				● ● ●				12.7	4.76	1.2	2.2	5.16		
		NP-CNGA120404GH2	★ ★		★ ★ ●												12.7	4.76	0.4	1.8	5.16		
		NP-CNGA120408GH2	★ ★		★ ★ ●												12.7	4.76	0.8	2.0	5.16		
		NP-CNGA120412GH2	● ★		● ★ ●												12.7	4.76	1.2	2.2	5.16		
		NEW NP-CNGA120404VA2		●													12.7	4.76	0.4	1.8	5.16		
		NEW NP-CNGA120408VA2		●													12.7	4.76	0.8	2.0	5.16		
		NEW NP-CNGA120412VA2		●													12.7	4.76	1.2	2.2	5.16		
		NP-CNGA120402FS2	★		★					★							12.7	4.76	0.2	1.7	5.16		
		NP-CNGA120404FS2	●	● ● ● ●					● ●				● ●				12.7	4.76	0.4	1.8	5.16		
		NP-CNGA120408FS2	●	● ● ● ●					● ●				● ●				12.7	4.76	0.8	2.0	5.16		
		NP-CNGA120412FS2	●	● ● ● ●					● ●				● ●				12.7	4.76	1.2	2.2	5.16		
		NP-CNGA120404TS2	●		●								★				12.7	4.76	0.4	1.8	5.16		
		NP-CNGA120408TS2	●		●								●				12.7	4.76	0.8	2.0	5.16		
		NP-CNGA120412TS2	●		●								●				12.7	4.76	1.2	2.2	5.16		
		NP-CNGA120404TA2	●		● ●				★ ●				★				12.7	4.76	0.4	1.8	5.16		
		NP-CNGA120408TA2	●		● ●				★ ●				●				12.7	4.76	0.8	2.0	5.16		
		NP-CNGA120412TA2	●		● ●				★ ●				●				12.7	4.76	1.2	2.2	5.16		
		NP-CNGA120404TH2			★ ●				●								12.7	4.76	0.4	1.8	5.16		
		NP-CNGA120408TH2	★		★ ●				●								12.7	4.76	0.8	2.0	5.16		
		NP-CNGA120412TH2	★		★ ●				●								12.7	4.76	1.2	2.2	5.16		
		NP-CNGA120404SF2											★				12.7	4.76	0.4	1.8	5.16		
		NP-CNGA120408SF2											●				12.7	4.76	0.8	2.0	5.16		
		NP-CNGA120412SF2											★				12.7	4.76	1.2	2.2	5.16		
	NP-CNGA120404SE2											★				12.7	4.76	0.4	1.8	5.16			
	NP-CNGA120408SE2											●				12.7	4.76	0.8	2.0	5.16			
	NP-CNGA120412SE2											★				12.7	4.76	1.2	2.2	5.16			



C008  
C009  
E015  
E038  
H006  
-008

● = NEW

PCBN

B

PCBN TURNING INSERTS

NEG

WITH HOLE

C

D

R

S

T

V

W

# PCBN TURNING INSERTS [NEGATIVE]

## 80° CN TYPE INSERTS WITH HOLE

PCBN

B

PCBN TURNING INSERTS

NEG

WITH HOLE

C

D


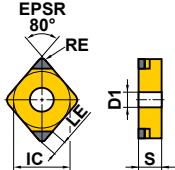

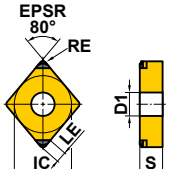

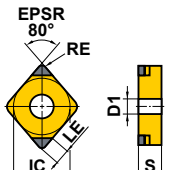

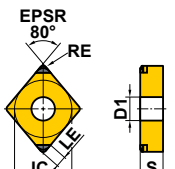


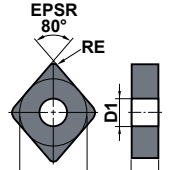
R

S

T

V

W

Work Material	H	Hardened Materials	● ● ● ● ● *	● ● ● *							Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting * : Unstable Cutting Honing (Last letter of order number) : Please refer to page B021									
	K	Cast Iron																		
	S	Heat-resistant Alloy, Titanium Alloy Sintered Alloy																		
Shape	Order Number	Coated PCBN					PCBN					Solid PCBN	Dimensions (mm)					Geometry	Applicable Holder Page	
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	NEW BC8130	NEW BC5110	MB8110	MB8120	MB8130		MB4120	MB710	MB730	MBS140	IC			S
NEW PETIT CUT (With Wiper) *1 	NP-CNGA120404GSWS2	●	●	★										12.7	4.76	0.4	1.8	5.16		C008 C009 E015 E038 H006 -008
	NP-CNGA120408GSWS2	●	●	●										12.7	4.76	0.8	2.0	5.16		
	NP-CNGA120412GSWS2	●	●	★										12.7	4.76	1.2	2.2	5.16		
	NP-CNGA120404GAWS2	●		●	●		★							12.7	4.76	0.4	1.8	5.16		
	NP-CNGA120408GAWS2	●		●	●		★							12.7	4.76	0.8	2.0	5.16		
	NP-CNGA120412GAWS2	●		●	●		★							12.7	4.76	1.2	2.2	5.16		
	NP-CNGA120404GBWL2		★	★	★		★							12.7	4.76	0.4	1.8	5.16		
	NP-CNGA120408GBWL2		★	★	★		★							12.7	4.76	0.8	2.0	5.16		
	NP-CNGA120412GBWL2		★	★	★		★							12.7	4.76	1.2	2.2	5.16		
	NP-CNGA120404FSWS2	●	★	★	★		★							12.7	4.76	0.4	1.8	5.16		
	NP-CNGA120408FSWS2	●	●	●	★		★							12.7	4.76	0.8	2.0	5.16		
	NP-CNGA120412FSWS2	●	★	★	★		★							12.7	4.76	1.2	2.2	5.16		
	NP-CNGA120404FBWL2		★	★	★		★							12.7	4.76	0.4	1.8	5.16		
NP-CNGA120408FBWL2		●	★	★		★							12.7	4.76	0.8	2.0	5.16			
NP-CNGA120412FBWL2		★	★	★		★							12.7	4.76	1.2	2.2	5.16			
NEW PETIT CUT 	BF-CNGM120404TS2	●	●										12.7	4.76	0.4	1.8	5.16		C008 C009 E015 E038 H006 -008	
	BF-CNGM120408TS2	●	●										12.7	4.76	0.8	2.0	5.16			
	BF-CNGM120412TS2	●	●											12.7	4.76	1.2	2.2			5.16
NEW PETIT CUT (With Breaker) 	BF-CNGM120408TSWS2	●											12.7	4.76	0.8	2.0	5.16		C008 C009 E015 E038 H006 -008	
	BF-CNGM120412TSWS2	●											12.7	4.76	1.2	2.2	5.16			
	BF-CNGM120408TAWS2	●												12.7	4.76	0.8	2.0			5.16
NEW PETIT CUT (With Breaker) 	BF-CNGM120412TAWS2	●											12.7	4.76	1.2	2.2	5.16		C008 C009 E015 E038 H006 -008	
NEW PETIT CUT 	BM-CNGM120404TA2	●	●										12.7	4.76	0.4	1.8	5.16			
	BM-CNGM120408TA2	●	●										12.7	4.76	0.8	2.0	5.16			
	BM-CNGM120412TA2	●	●										12.7	4.76	1.2	2.2	5.16			
NEW PETIT CUT 	CNGA120408												12.7	4.76	0.8	-	5.16		C008 C009 E015 E038 H006 -008	
	CNGA120412												12.7	4.76	1.2	-	5.16			

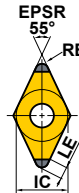
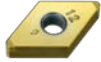
\*1 Please refer to B024 before using wiper inserts.

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.

# 55° DN TYPE INSERTS WITH HOLE

Work Material	H	Hardened Materials											Cutting Conditions (Guide) :					Geometry	Applicable Holder Page							
	K	Cast Iron											● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting													
Shape	S	Heat-resistant Alloy, Titanium Alloy	Coated PCBN					PCBN					Solid PCBN	Dimensions (mm)					Geometry	Applicable Holder Page						
	Sintered Alloy	NEW	BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW	BC5110	NEW	MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140			IC	S	RE	LE	D1	
NEW PETIT CUT		NP-DNGA150404GS4	★	★	★														12.7	4.76	0.4	2.1	5.16			
		NP-DNGA150408GS4	★	★	★															12.7	4.76	0.8	2.0			5.16
		NP-DNGA150412GS4	★	★	★															12.7	4.76	1.2	1.8			5.16
		NP-DNGA150604GS4	●	●	●															12.7	6.35	0.4	2.1			5.16
		NP-DNGA150608GS4	●	●	●															12.7	6.35	0.8	2.0			5.16
		NP-DNGA150612GS4	●	●	●															12.7	6.35	1.2	1.8			5.16
		NP-DNGA150404GA4	★		★	★			★											12.7	4.76	0.4	2.1			5.16
		NP-DNGA150408GA4	★		★	★			★											12.7	4.76	0.8	2.0			5.16
		NP-DNGA150412GA4	★		★	★			★											12.7	4.76	1.2	1.8			5.16
		NP-DNGA150604GA4	●		●	●			★											12.7	6.35	0.4	2.1			5.16
		NP-DNGA150608GA4	●		●	●			★											12.7	6.35	0.8	2.0			5.16
		NP-DNGA150612GA4	●		●	●			★											12.7	6.35	1.2	1.8			5.16
		NP-DNGA150404GH4	★	★	★	★														12.7	4.76	0.4	2.1			5.16
		NP-DNGA150408GH4	★	★	★	★														12.7	4.76	0.8	2.0			5.16
		NP-DNGA150412GH4	★	★	★	★														12.7	4.76	1.2	1.8			5.16
		NP-DNGA150604GH4	★	★	★	●														12.7	6.35	0.4	2.1			5.16
		NP-DNGA150608GH4	★	★	★	●														12.7	6.35	0.8	2.0			5.16
		NP-DNGA150612GH4	★	★	★	●														12.7	6.35	1.2	1.8			5.16
	NEW		NP-DNGA150404VA4	★																12.7	4.76	0.4	2.1			5.16
	NEW		NP-DNGA150408VA4	★																12.7	4.76	0.8	2.0			5.16
	NEW		NP-DNGA150412VA4	★																12.7	4.76	1.2	1.8			5.16
	NEW		NP-DNGA150604VA4	★																12.7	6.35	0.4	2.1			5.16
	NEW		NP-DNGA150608VA4	★																12.7	6.35	0.8	2.0			5.16
	NEW		NP-DNGA150612VA4	★																12.7	6.35	1.2	1.8			5.16
			NP-DNGA150404FS4	★	★	★	★		★											12.7	4.76	0.4	2.1			5.16
			NP-DNGA150408FS4	★	★	★	★		★											12.7	4.76	0.8	2.0			5.16
			NP-DNGA150412FS4	★	★	★	★		★											12.7	4.76	1.2	1.8			5.16
			NP-DNGA150604FS4	★	●	★			★											12.7	6.35	0.4	2.1			5.16
			NP-DNGA150608FS4	★	●	★			★											12.7	6.35	0.8	2.0			5.16
			NP-DNGA150612FS4	★	●	★			★											12.7	6.35	1.2	1.8			5.16
		NP-DNGA150404TS4	★		★														12.7	4.76	0.4	2.1	5.16			
		NP-DNGA150408TS4	★		★														12.7	4.76	0.8	2.0	5.16			
		NP-DNGA150412TS4	★		★														12.7	4.76	1.2	1.8	5.16			
		NP-DNGA150604TS4	★		★														12.7	6.35	0.4	2.1	5.16			
		NP-DNGA150608TS4	★		★														12.7	6.35	0.8	2.0	5.16			
		NP-DNGA150612TS4	★		★														12.7	6.35	1.2	1.8	5.16			
		NP-DNGA150404TA4	★		★	★		★	★										12.7	4.76	0.4	2.1	5.16			
		NP-DNGA150408TA4	★		★	★		★	★										12.7	4.76	0.8	2.0	5.16			
		NP-DNGA150412TA4	★		★	★		★	★										12.7	4.76	1.2	1.8	5.16			
		NP-DNGA150604TA4	★		★	●		★											12.7	6.35	0.4	2.1	5.16			
		NP-DNGA150608TA4	★		★	●		★											12.7	6.35	0.8	2.0	5.16			
		NP-DNGA150612TA4	★		★	●		★											12.7	6.35	1.2	1.8	5.16			



C010  
C011  
E015  
E038  
-040  
H009  
-011

● = NEW

GRADES > B004  
IDENTIFICATION > B002

PCBN

B

PCBN TURNING INSERTS

NEG

WITH HOLE

C

D

R

S

T

V

W

B039

# PCBN TURNING INSERTS [NEGATIVE]

## 55° DN TYPE INSERTS WITH HOLE

PCBN

B

PCBN TURNING INSERTS

NEG

WITH HOLE

C

D

R

S

T

V

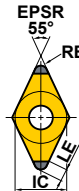
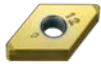
W

Work Material	H	Hardened Materials											Cutting Conditions (Guide) :					Shape	Order Number	Coated PCBN	PCBN	Solid PCBN	Dimensions (mm)					Geometry	Applicable Holder Page
	K	Cast Iron											● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting																
	S	Heat-resistant Alloy, Titanium Alloy											Honing (Last letter of order number) : Please refer to page B021																
		Sintered Alloy	BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	NEW MB8120	NEW MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1								
NEW PETIT CUT																								C010 C011 E015 E038 -040 H009 -011					
NEW PETIT CUT																								C010 C011 E015 E038 -040 H009 -011					

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.  
□ : Non stock, produced to order only.

Work Material	H	Hardened Materials	●	●	●	●	⊕	●	●	⊕	●	●	●	⊕	Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ⊕ : Unstable Cutting Honing (Last letter of order number) : Please refer to page B021							
	K	Cast Iron																				
	S	Heat-resistant Alloy, Titanium Alloy																				
Shape	Order Number	Coated PCBN					PCBN					Solid PCBN	Dimensions (mm)					Geometry	Applicable Holder Page			
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S			RE	LE	D1
NEW PETIT CUT	NEW NP-DNGA150404VA2	★													12.7	4.76	0.4	2.1	5.16			
	NEW NP-DNGA150408VA2	★													12.7	4.76	0.8	2.0	5.16			
	NEW NP-DNGA150412VA2	★													12.7	4.76	1.2	1.8	5.16			
	NEW NP-DNGA150604VA2	●													12.7	6.35	0.4	2.1	5.16			
	NEW NP-DNGA150608VA2	●													12.7	6.35	0.8	2.0	5.16			
	NEW NP-DNGA150612VA2	●													12.7	6.35	1.2	1.8	5.16			
	NP-DNGA150402FS2	★		★				★							12.7	4.76	0.2	2.2	5.16			
	NP-DNGA150404FS2	★	★	★	★			★	★		★				12.7	4.76	0.4	2.1	5.16			
	NP-DNGA150408FS2	★	★	★	★			★	★		★				12.7	4.76	0.8	2.0	5.16			
	NP-DNGA150412FS2	★	★	★	★			★	★		★				12.7	4.76	1.2	1.8	5.16			
	NP-DNGA150604FS2	●	●	●	●			★	★		●				12.7	6.35	0.4	2.1	5.16			
	NP-DNGA150608FS2	●	●	●	●			★	★		●				12.7	6.35	0.8	2.0	5.16			
	NP-DNGA150612FS2	●	●	●	●			●			●				12.7	6.35	1.2	1.8	5.16			
	NP-DNGA150404TS2	★		★							★				12.7	4.76	0.4	2.1	5.16			
	NP-DNGA150408TS2	★		★							★				12.7	4.76	0.8	2.0	5.16			
	NP-DNGA150412TS2	★		★							★				12.7	4.76	1.2	1.8	5.16			
	NP-DNGA150604TS2	●		●							★				12.7	6.35	0.4	2.1	5.16			
	NP-DNGA150608TS2	●		●							★				12.7	6.35	0.8	2.0	5.16			
	NP-DNGA150612TS2	●		●							★				12.7	6.35	1.2	1.8	5.16			
	NP-DNGA150404TA2	★		★	★				★	●					12.7	4.76	0.4	2.1	5.16			
	NP-DNGA150408TA2	★		★	★				★	●					12.7	4.76	0.8	2.0	5.16			
	NP-DNGA150412TA2	★		★	★				★	★					12.7	4.76	1.2	1.8	5.16			
	NP-DNGA150604TA2	●		●	●				★						12.7	6.35	0.4	2.1	5.16			
	NP-DNGA150608TA2	●		●	●				●						12.7	6.35	0.8	2.0	5.16			
	NP-DNGA150612TA2	●		●	●				★						12.7	6.35	1.2	1.8	5.16			
	NP-DNGA150404TH2			★	★						★				12.7	4.76	0.4	2.1	5.16			
	NP-DNGA150408TH2	★		★	★						★				12.7	4.76	0.8	2.0	5.16			
	NP-DNGA150412TH2	★		★	★						★				12.7	4.76	1.2	1.8	5.16			
	NP-DNGA150604TH2			★	★										12.7	6.35	0.4	2.1	5.16			
	NP-DNGA150608TH2	★		★	★										12.7	6.35	0.8	2.0	5.16			
	NP-DNGA150612TH2	★		★	★										12.7	6.35	1.2	1.8	5.16			
	NP-DNGA150404SF2										★				12.7	4.76	0.4	2.1	5.16			
	NP-DNGA150408SF2										★				12.7	4.76	0.8	2.0	5.16			
	NP-DNGA150412SF2										★				12.7	4.76	1.2	1.8	5.16			
	NP-DNGA150604SF2										★				12.7	6.35	0.4	2.1	5.16			
	NP-DNGA150608SF2										★				12.7	6.35	0.8	2.0	5.16			
	NP-DNGA150612SF2										★				12.7	6.35	1.2	1.8	5.16			
	NP-DNGA150404SE2										★				12.7	4.76	0.4	2.1	5.16			
	NP-DNGA150408SE2										★				12.7	4.76	0.8	2.0	5.16			
	NP-DNGA150412SE2										★				12.7	4.76	1.2	1.8	5.16			
	NP-DNGA150604SE2										★				12.7	6.35	0.4	2.1	5.16			
	NP-DNGA150608SE2										★				12.7	6.35	0.8	2.0	5.16			
NP-DNGA150612SE2										★				12.7	6.35	1.2	1.8	5.16				



C010  
C011  
E015  
E038  
-040  
H009  
-011

● = NEW

# PCBN TURNING INSERTS [NEGATIVE]

## 55° DN TYPE INSERTS WITH HOLE

PCBN

B

PCBN TURNING INSERTS

NEG

WITH HOLE

C

D

R

S

NEW

T

V

W

Work Material	H	Hardened Materials											Cutting Conditions (Guide) :							
	K	Cast Iron											● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting							
Shape	S	Heat-resistant Alloy, Titanium Alloy											Honing (Last letter of order number) :					Geometry	Applicable Holder Page	
		Sintered Alloy											Please refer to page B021							
Order Number	Coated PCBN					PCBN					Solid PCBN	Dimensions (mm)								
	NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S			RE	LE
NEW PETIT CUT (With Wiper) *	NP-DNGA150404GSWS2JR	★													12.7	4.76	0.4	1.8	5.16	 C010 C011 E015 E038 -040 H009 -011
	NP-DNGA150404GSWS2JL	★													12.7	4.76	0.4	1.8	5.16	
	NP-DNGA150408GSWS2JR	★													12.7	4.76	0.8	1.7	5.16	
	NP-DNGA150408GSWS2JL	★													12.7	4.76	0.8	1.7	5.16	
	NP-DNGA150604GSWS2JR	●													12.7	6.35	0.4	1.8	5.16	
	NP-DNGA150604GSWS2JL	●													12.7	6.35	0.4	1.8	5.16	
	NP-DNGA150608GSWS2JR	●													12.7	6.35	0.8	1.7	5.16	
	NP-DNGA150608GSWS2JL	●													12.7	6.35	0.8	1.7	5.16	
	NP-DNGA150404GAWS2JR	★		★				★							12.7	4.76	0.4	1.8	5.16	
	NP-DNGA150404GAWS2JL	★		★				★							12.7	4.76	0.4	1.8	5.16	
	NP-DNGA150408GAWS2JR	★		★				★							12.7	4.76	0.8	1.7	5.16	
	NP-DNGA150408GAWS2JL	★		★				★							12.7	4.76	0.8	1.7	5.16	
	NP-DNGA150604GAWS2JR	●		●				★							12.7	6.35	0.4	1.8	5.16	
	NP-DNGA150604GAWS2JL	●		●				★							12.7	6.35	0.4	1.8	5.16	
NP-DNGA150608GAWS2JR	●		●				★							12.7	6.35	0.8	1.7	5.16		
NP-DNGA150608GAWS2JL	●		●				★							12.7	6.35	0.8	1.7	5.16		
NEW PETIT CUT	BF-DNGM150404TS2	★		●										12.7	4.76	0.4	2.1	5.16	 C010 C011 E015 E038 -040 H009 -011	
	BF-DNGM150408TS2	★		●										12.7	4.76	0.8	2.0	5.16		
	BF-DNGM150412TS2	★		●										12.7	4.76	1.2	1.8	5.16		
(With Breaker)																				
NEW PETIT CUT (With Wiper) *	BF-DNGM150408TSWS2	★												12.7	4.76	0.8	2.4	5.16	 C010 C011 E015 E038 -040 H009 -011	
	BF-DNGM150412TSWS2	★												12.7	4.76	1.2	2.6	5.16		
	BF-DNGM150408TAWS2	●												12.7	4.76	0.8	2.4	5.16		
	BF-DNGM150412TAWS2	●												12.7	4.76	1.2	2.6	5.16		
(With Breaker)																				
NEW PETIT CUT	BM-DNGM150404TA2	★		★										12.7	4.76	0.4	2.1	5.16	 C010 C011 E015 E038 -040 H009 -011	
	BM-DNGM150408TA2	★		★										12.7	4.76	0.8	2.0	5.16		
	BM-DNGM150412TA2	★		★										12.7	4.76	1.2	1.8	5.16		
	BM-DNGM150604TA2			●										12.7	6.35	0.4	2.1	5.16		
	BM-DNGM150608TA2			●										12.7	6.35	0.8	2.0	5.16		
	BM-DNGM150612TA2			●										12.7	6.35	1.2	1.8	5.16		
(With Breaker)																				

\* Please refer to B024 before using wiper inserts.

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.

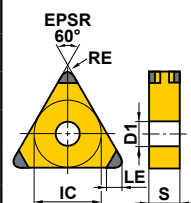




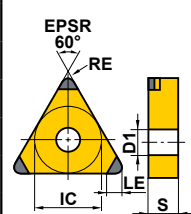
# PCBN TURNING INSERTS [NEGATIVE]

## 60° TN TYPE INSERTS WITH HOLE

Work Material	H	Hardened Materials											Cutting Conditions (Guide) :					Geometry	Applicable Holder Page		
	K	Cast Iron											● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting								
	S	Heat-resistant Alloy, Titanium Alloy											Honing (Last letter of order number) : Please refer to page B021								
Shape	Order Number	Coated PCBN					PCBN					Solid PCBN					Dimensions (mm)				
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	NEW MB8120	NEW MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-TNGA160404GS6	●	●	●													9.525	4.76	0.4	1.6	3.81
	NP-TNGA160408GS6	●	●	●													9.525	4.76	0.8	1.7	3.81
	NP-TNGA160412GS6	●	●	●													9.525	4.76	1.2	1.9	3.81
	NP-TNGA160404GA6	●	●	●					★								9.525	4.76	0.4	1.6	3.81
	NP-TNGA160408GA6	●	●	●					★								9.525	4.76	0.8	1.7	3.81
	NP-TNGA160412GA6	●	●	●					★								9.525	4.76	1.2	1.9	3.81
	NP-TNGA160404GH6	★	★	★	★												9.525	4.76	0.4	1.6	3.81
	NP-TNGA160408GH6	★	★	★	★												9.525	4.76	0.8	1.7	3.81
	NP-TNGA160412GH6	★	★	★	★												9.525	4.76	1.2	1.9	3.81
	NEW NP-TNGA160404VA6	★															9.525	4.76	0.4	1.6	3.81
	NEW NP-TNGA160408VA6	★															9.525	4.76	0.8	1.7	3.81
	NEW NP-TNGA160412VA6	★															9.525	4.76	1.2	1.9	3.81
	NP-TNGA160404FS6	★	●	★	★				★								9.525	4.76	0.4	1.6	3.81
	NP-TNGA160408FS6	★	●	★	★				★								9.525	4.76	0.8	1.7	3.81
	NP-TNGA160412FS6	★	●	★	★				★								9.525	4.76	1.2	1.9	3.81
	NP-TNGA160404TS6	★		★													9.525	4.76	0.4	1.6	3.81
	NP-TNGA160408TS6	★		★													9.525	4.76	0.8	1.7	3.81
	NP-TNGA160412TS6	★		★													9.525	4.76	1.2	1.9	3.81
	NP-TNGA160404TA6	★		★	●				★	★							9.525	4.76	0.4	1.6	3.81
	NP-TNGA160408TA6	★		★	●				★	★							9.525	4.76	0.8	1.7	3.81
NP-TNGA160412TA6	★		★	●				★	★							9.525	4.76	1.2	1.9	3.81	
NP-TNGA160404TH6			★	★					★							9.525	4.76	0.4	1.6	3.81	
NP-TNGA160408TH6	★		★	●				★								9.525	4.76	0.8	1.7	3.81	
NP-TNGA160412TH6	★		★	●				★								9.525	4.76	1.2	1.9	3.81	
NEW PETIT CUT	NP-TNGA160402GS3	★		★												9.525	4.76	0.2	1.5	3.81	
	NP-TNGA160404GS3	★	●	★				★			★					9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408GS3	★	●	★				★			●	★	●			9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412GS3	★	●	★				★			★	★	★			9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160402GA3	★		★					★							9.525	4.76	0.2	1.5	3.81	
	NP-TNGA160404GA3	●		●	●				★							9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408GA3	●		●	●				●							9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412GA3	★		★	●				★							9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160404GH3	★		★	★	●										9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408GH3	★		★	★	●										9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412GH3	★		★	★	●										9.525	4.76	1.2	1.9	3.81	
	NEW NP-TNGA160404VA3	★														9.525	4.76	0.4	1.6	3.81	
	NEW NP-TNGA160408VA3	●														9.525	4.76	0.8	1.7	3.81	
	NEW NP-TNGA160412VA3	★														9.525	4.76	1.2	1.9	3.81	
	NP-TNGA160402FS3	★		★					★							9.525	4.76	0.2	1.5	3.81	
	NP-TNGA160404FS3	●	●	●	●				★	★		●				9.525	4.76	0.4	1.6	3.81	
	NP-TNGA160408FS3	●	●	●	●				★	★		★				9.525	4.76	0.8	1.7	3.81	
	NP-TNGA160412FS3	●	●	●	●				★	★		★				9.525	4.76	1.2	1.9	3.81	




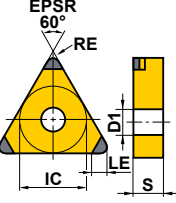
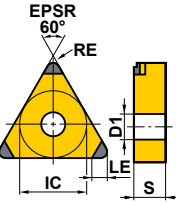
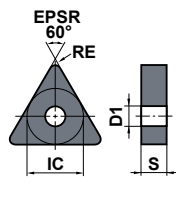
C016  
-018  
E016  
E037



C016  
-018  
E016  
E037

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.

Work Material	H	Hardened Materials													<b>Cutting Conditions (Guide) :</b>				Geometry	Applicable Holder Page
	K	Cast Iron													● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting					
	S	Heat-resistant Alloy, Titanium Alloy													<b>Honing (Last letter of order number) :</b> Please refer to page B021					
		Sintered Alloy																		
Shape	Order Number	Coated PCBN					PCBN					Solid PCBN	Dimensions (mm)							
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	NEW BC8130	NEW MB8110	NEW MB8120	NEW MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE			LE
	NP-TNGA160404TS3	●		●						★				9.525	4.76	0.4	1.6	3.81		C016 -018 E016 E037
	NP-TNGA160408TS3	●		●						★				9.525	4.76	0.8	1.7	3.81		
	NP-TNGA160412TS3	●		●							★			9.525	4.76	1.2	1.9	3.81		
	NP-TNGA160404TA3	●			●	●		●	●					9.525	4.76	0.4	1.6	3.81		
	NP-TNGA160408TA3	●			●	●		●	★					9.525	4.76	0.8	1.7	3.81		
	NP-TNGA160412TA3	●			●	●		●	★					9.525	4.76	1.2	1.9	3.81		
	NP-TNGA160404TH3				★	★			★					9.525	4.76	0.4	1.6	3.81		
	NP-TNGA160408TH3	★		★	★				★					9.525	4.76	0.8	1.7	3.81		
	NP-TNGA160412TH3	★		★	★				★					9.525	4.76	1.2	1.9	3.81		
	NP-TNGA160404SF3									★				9.525	4.76	0.4	1.6	3.81		
	NP-TNGA160408SF3									★				9.525	4.76	0.8	1.7	3.81		
	NP-TNGA160412SF3									★				9.525	4.76	1.2	1.9	3.81		
	NP-TNGA160404SE3									★				9.525	4.76	0.4	1.6	3.81		
	NP-TNGA160408SE3									★				9.525	4.76	0.8	1.7	3.81		
NP-TNGA160412SE3									★				9.525	4.76	1.2	1.9	3.81			
NEW PETIT CUT	BM-TNGM160408TA3				●								9.525	4.76	0.8	1.7	3.81		C016 -018 E016 E037	
	BM-TNGM160412TA3				●								9.525	4.76	1.2	1.9	3.81			
(With Breaker)	TNGA160408									★			9.525	4.76	0.8	—	3.81		C016 -018 E016 E037	
	TNGA160412									★			9.525	4.76	1.2	—	3.81			

● = NEW

PCBN

B

PCBN TURNING INSERTS

NEG

WITH HOLE

C

D

R

S

T

V

W

# PCBN TURNING INSERTS [NEGATIVE]

## 35° VN TYPE INSERTS WITH HOLE

PCBN

B

PCBN TURNING INSERTS

NEG

WITH HOLE

C

D

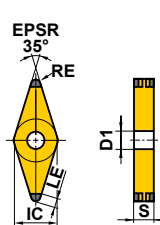
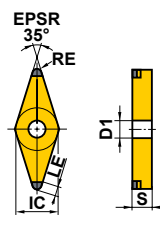
R

S

T

V

W

Work Material	H	Hardened Materials												Cutting Conditions (Guide) :					Geometry	Applicable Holder Page
	K	Cast Iron												● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting						
	S	Heat-resistant Alloy, Titanium Alloy												Honing (Last letter of order number) : Please refer to page B021						
Shape	Order Number	Coated PCBN					PCBN					Solid PCBN	Dimensions (mm)							
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	NEW BC8130	NEW BC5110	MB8110	NEW MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S			RE
NEW PETIT CUT	NP-VNGA16040GS4	★	●	★											9.525	4.76	0.4	2.5	3.81	 C019 -021 E017
	NP-VNGA16040GS4	●		●	●										9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412GS4	★			★										9.525	4.76	1.2	1.5	3.81	
	NP-VNGA16040GA4	●	●		●	●		★							9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408GA4	●	●		●	●		★							9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412GA4	●			●	●		★							9.525	4.76	1.2	1.5	3.81	
	NP-VNGA16040GH4	★		★	★	★									9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408GH4	★		★	★	★									9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412GH4			★	★	★									9.525	4.76	1.2	1.5	3.81	
	NEW NP-VNGA16040VA4	★													9.525	4.76	0.4	2.5	3.81	
	NEW NP-VNGA160408VA4	★													9.525	4.76	0.8	2.0	3.81	
	NEW NP-VNGA160412VA4	★													9.525	4.76	1.2	1.5	3.81	
	NP-VNGA16040FS4	★		●	★	★		★							9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408FS4	★		●	★	★		★							9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412FS4					★									9.525	4.76	1.2	1.5	3.81	
	NP-VNGA16040TS4	★			★										9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408TS4	★			★										9.525	4.76	0.8	2.0	3.81	
	NP-VNGA16040TA4	★		★	●			★							9.525	4.76	0.4	2.5	3.81	
	NP-VNGA160408TA4	★		★	●			★							9.525	4.76	0.8	2.0	3.81	
	NP-VNGA160412TA4				★	●		★							9.525	4.76	1.2	1.5	3.81	
NP-VNGA16040TH4	★		★	★										9.525	4.76	0.4	2.5	3.81		
NP-VNGA160408TH4	★		★	★										9.525	4.76	0.8	2.0	3.81		
NP-VNGA160412TH4			★	★										9.525	4.76	1.2	1.5	3.81		
NEW PETIT CUT	NP-VNGA160402GS2	★		★										9.525	4.76	0.2	2.5	3.81	 C019 -021 E017	
	NP-VNGA160404GS2	●	●	●		★				★				9.525	4.76	0.4	2.5	3.81		
	NP-VNGA160408GS2	●	●	●		★				★				9.525	4.76	0.8	2.0	3.81		
	NP-VNGA160412GS2	★		★										9.525	4.76	1.2	1.5	3.81		
	NP-VNGA160402GA2	●		●				★						9.525	4.76	0.2	2.5	3.81		
	NP-VNGA160404GA2	●		●	●			★						9.525	4.76	0.4	2.5	3.81		
	NP-VNGA160408GA2	●		●	●			★						9.525	4.76	0.8	2.0	3.81		
	NP-VNGA160412GA2	★		★	★			★						9.525	4.76	1.2	1.5	3.81		
	NP-VNGA160404GH2	★		★	★	★								9.525	4.76	0.4	2.5	3.81		
	NP-VNGA160408GH2	★		★	★	★								9.525	4.76	0.8	2.0	3.81		
	NP-VNGA160412GH2			★	★	★								9.525	4.76	1.2	1.5	3.81		
	NEW NP-VNGA16040VA2	●													9.525	4.76	0.4	2.5		3.81
	NEW NP-VNGA160408VA2	●													9.525	4.76	0.8	2.0		3.81
	NEW NP-VNGA160412VA2	★													9.525	4.76	1.2	1.5		3.81
	NP-VNGA160402FS2	★		★				★							9.525	4.76	0.2	2.5		3.81
NP-VNGA160404FS2	★		●	★	●		★	★		★				9.525	4.76	0.4	2.5	3.81		
NP-VNGA160408FS2	★		●	★	●		★	★		●				9.525	4.76	0.8	2.0	3.81		
NP-VNGA160412FS2				★										9.525	4.76	1.2	1.5	3.81		

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.

Work Material	H	Hardened Materials															Cutting Conditions (Guide) :				
	K	Cast Iron															● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting				
	S	Heat-resistant Alloy, Titanium Alloy															Honing (Last letter of order number) :				
		Sintered Alloy															Please refer to page B021				
Shape	Order Number	Coated PCBN					PCBN					Solid PCBN	Dimensions (mm)					Geometry	Applicable Holder Page		
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	NEW BC8130	NEW BC5110	NEW MB8110	NEW MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S			RE	LE
NEW PETIT CUT	NP-VNGA160404TS2	*		*							*				9.525	4.76	0.4	2.5	3.81	<p>C019 -021 E017</p>	
	NP-VNGA160408TS2	*		*							*			9.525	4.76	0.8	2.0	3.81			
	NP-VNGA160404TA2	●			●	●			●					9.525	4.76	0.4	2.5	3.81			
	NP-VNGA160408TA2	●			●	●			*					9.525	4.76	0.8	2.0	3.81			
	NP-VNGA160412TA2				*	*			*					9.525	4.76	1.2	1.5	3.81			
	NP-VNGA160404TH2	*		*	*									9.525	4.76	0.4	2.5	3.81			
	NP-VNGA160408TH2	*		*	*									9.525	4.76	0.8	2.0	3.81			
	NP-VNGA160412TH2				*	*								9.525	4.76	1.2	1.5	3.81			
	NP-VNGA160404SF2									*				9.525	4.76	0.4	2.5	3.81			
	NP-VNGA160408SF2									*				9.525	4.76	0.8	2.0	3.81			
	NP-VNGA160404SE2									*				9.525	4.76	0.4	2.5	3.81			
	NP-VNGA160408SE2									*				9.525	4.76	0.8	2.0	3.81			

● = NEW

PCBN

B

PCBN TURNING INSERTS

NEG

WITH HOLE

C

D

R

S

T

V

W

GRADES > B004  
IDENTIFICATION > B002

B047

# PCBN TURNING INSERTS [NEGATIVE]

## 80° WN TYPE INSERTS WITH HOLE

PCBN

B

PCBN TURNING INSERTS

NEG

WITH HOLE

C

D


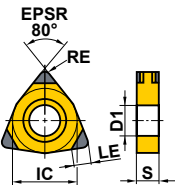

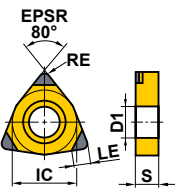

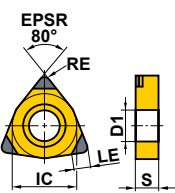
R

S

T

V

W

Work Material	H	Hardened Materials											Cutting Conditions (Guide) :					Geometry	Applicable Holder Page		
	K	Cast Iron											● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting								
Shape	Order Number	Coated PCBN					PCBN					Solid PCBN	Dimensions (mm)					Geometry	Applicable Holder Page		
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S			RE	LE
NEW PETIT CUT 	NP-WNGA080408GS6	●		★	●										12.7	4.76	0.8	2.0	5.16		C022 C023 E017
	NP-WNGA080408FS6	★		★	★										12.7	4.76	0.8	2.0	5.16		
	NP-WNGA080408TS6	★			★										12.7	4.76	0.8	2.0	5.16		
NEW PETIT CUT 	NP-WNGA080408GS3	★		★	★						★			12.7	4.76	0.8	2.0	5.16		C022 C023 E017	
	NP-WNGA080408GA3		★		★	★								12.7	4.76	0.8	2.0	5.16			
	NP-WNGA080408GH3				★	★	★							12.7	4.76	0.8	2.0	5.16			
	NP-WNGA080408FS3	★		★	★	★					★			12.7	4.76	0.8	2.0	5.16			
	NP-WNGA080408TS3	★			★						★			12.7	4.76	0.8	2.0	5.16			
	NP-WNGA080408TA3		★		★	★								12.7	4.76	0.8	2.0	5.16			
	NP-WNGA080408TH3				★	★								12.7	4.76	0.8	2.0	5.16			
	NP-WNGA080408SF3											★		12.7	4.76	0.8	2.0	5.16			
NP-WNGA080408SE3											★		12.7	4.76	0.8	2.0	5.16				
NEW PETIT CUT (With Wiper) * 	NP-WNGA080408GSWS3	●			●									12.7	4.76	0.8	2.0	5.16		C022 C023 E017	

\* Please refer to B024 before using wiper inserts.

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.

# 80° CN TYPE INSERTS WITHOUT HOLE

Work Material	H	Hardened Materials	● ● ● ● ● ● ✱	● ● ● ✱	● ● ● ● ✱	● ● ● ● ✱	Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting					Geometry	Applicable Holder Page								
	K	Cast Iron							IC	S	RE			LE							
Shape	S	Heat-resistant Alloy, Titanium Alloy						Dimensions (mm)				Geometry	Applicable Holder Page								
		Sintered Alloy																			
		Coated PCBN	PCBN			Solid PCBN															
Order Number		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	Geometry	Applicable Holder Page
	CNGN120404														●	12.7	4.76	0.4	—		—
	CNGN120408														●	12.7	4.76	0.8	—		
	CNGN120412														●	12.7	4.76	1.2	—		

● = NEW

# 55° DN TYPE INSERTS WITHOUT HOLE

Work Material	H	Hardened Materials	● ● ● ● ● ● ✱	● ● ● ✱	● ● ● ● ✱	● ● ● ● ✱	Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting					Geometry	Applicable Holder Page								
	K	Cast Iron							IC	S	RE			LE							
Shape	S	Heat-resistant Alloy, Titanium Alloy						Dimensions (mm)				Geometry	Applicable Holder Page								
		Sintered Alloy																			
		Coated PCBN	PCBN			Solid PCBN															
Order Number		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	Geometry	Applicable Holder Page
	DNGN110308														★	9.525	3.18	0.8	—		—
	DNGN110312														★	9.525	3.18	1.2	—		

● = NEW


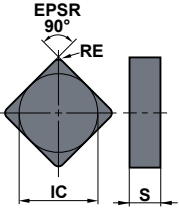
# RN TYPE INSERTS WITHOUT HOLE

Work Material	H	Hardened Materials	● ● ● ● ● ● ✱	● ● ● ✱	● ● ● ● ✱	● ● ● ● ✱	Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting					Geometry	Applicable Holder Page								
	K	Cast Iron							IC	S	RE			LE							
Shape	S	Heat-resistant Alloy, Titanium Alloy						Dimensions (mm)				Geometry	Applicable Holder Page								
		Sintered Alloy																			
		Coated PCBN	PCBN			Solid PCBN															
Order Number		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	MB8120	MB8130	MB4120	MB710	MB730	MBS140	IC	S	RE	LE	Geometry	Applicable Holder Page
	RNGN090300														●	9.525	3.18	—	—		—
	RNGN120300														●	12.7	3.18	—	—		
	RNGN120400														●	12.7	4.76	—	—		

● = NEW

# PCBN TURNING INSERTS [NEGATIVE]

## 90° SN TYPE INSERTS WITHOUT HOLE

Work Material	H	Hardened Materials																	Cutting Conditions (Guide) :					Geometry	Applicable Holder Page
	K	Cast Iron																	● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting						
Shape	Order Number	Coated PCBN					PCBN					Solid PCBN	Dimensions (mm)				IC	S	RE	LE					
		NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW		IC	S	RE	LE									
	SNGN090308																		●	9.525	3.18	0.8	—		—
	SNGN090312																		●	9.525	3.18	1.2	—		
	SNGN090316																		●	9.525	3.18	1.6	—		
	SNGN090408																		★	9.525	4.76	0.8	—		
	SNGN090412																		★	9.525	4.76	1.2	—		
	SNGN120408																		●	12.7	4.76	0.8	—		
	SNGN120412																		●	12.7	4.76	1.2	—		
	SNGN120416																		●	12.7	4.76	1.6	—		

● = NEW

PCBN

B

PCBN TURNING INSERTS

NEG

WITHOUT HOLE

C

D

R


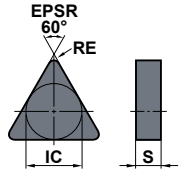
S

T

V

W

## 60° TN TYPE INSERTS WITHOUT HOLE

Work Material	H	Hardened Materials																	Cutting Conditions (Guide) :					Geometry	Applicable Holder Page
	K	Cast Iron																	● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting						
Shape	Order Number	Coated PCBN					PCBN					Solid PCBN	Dimensions (mm)				IC	S	RE	LE					
		NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW		IC	S	RE	LE									
	TNGN160408																		●	9.525	4.76	0.8	—		—
	TNGN160412																		●	9.525	4.76	1.2	—		
	TNGN160416																		●	9.525	4.76	1.6	—		

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.

□ : Non stock, produced to order only.

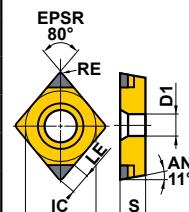






# 80° CP TYPE INSERTS WITH HOLE

Work Material	H	Hardened Materials	● ● ● ● ● ✱					● ● ✱		Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting Honing (Last letter of order number) : Please refer to page B021									
	K	Cast Iron																	
Shape	S	Heat-resistant Alloy, Titanium Alloy								Applicable Holder Page									
		Sintered Alloy																	
Order Number	Coated PCBN					PCBN					Dimensions (mm)					Geometry			
	<b>NEW</b>					<b>NEW</b>	<b>NEW</b>												
	BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	D1	
NEW PETIT CUT	NP-CPGB080204GS2	★	●	★										7.94	2.38	0.4	1.8	3.5	
	NP-CPGB080208GS2	★	●	★										7.94	2.38	0.8	2.0	3.5	
	NP-CPGB090302GS2	★	★	★										9.525	3.18	0.2	1.7	4.5	
	NP-CPGB090304GS2	★	●	★										9.525	3.18	0.4	1.8	4.5	
	NP-CPGB090308GS2	★	●	★										9.525	3.18	0.8	2.0	4.5	
	NP-CPGB080204GA2		●		●	●								7.94	2.38	0.4	1.8	3.5	
	NP-CPGB080208GA2		●		●	●								7.94	2.38	0.8	2.0	3.5	
	NP-CPGB080212GA2		★		★	★								7.94	2.38	1.2	2.2	3.5	
	NP-CPGB090302GA2		★		★									9.525	3.18	0.2	1.7	4.5	
	NP-CPGB090304GA2		●		●	●								9.525	3.18	0.4	1.8	4.5	
	NP-CPGB090308GA2		●		●	●								9.525	3.18	0.8	2.0	4.5	
	NP-CPGB090312GA2		★		★	★								9.525	3.18	1.2	2.2	4.5	
	<b>NEW</b> NP-CPGB090304VA2		●											9.525	3.18	0.4	1.8	4.5	
	<b>NEW</b> NP-CPGB090308VA2		●											9.525	3.18	0.8	2.0	4.5	
	<b>NEW</b> NP-CPGB090312VA2		★											9.525	3.18	1.2	2.2	4.5	
	NP-CPGB080202FS2										★			7.94	2.38	0.2	1.7	3.5	
	NP-CPGB080204FS2			★							●			7.94	2.38	0.4	1.8	3.5	
	NP-CPGB080208FS2			★										7.94	2.38	0.8	2.0	3.5	
	NP-CPGB090302FS2			★	★						★			9.525	3.18	0.2	1.7	4.5	
	NP-CPGB090304FS2			●	★						★			9.525	3.18	0.4	1.8	4.5	
	NP-CPGB090308FS2			●	★						★			9.525	3.18	0.8	2.0	4.5	
	NP-CPGB090312FS2				★									9.525	3.18	1.2	2.2	4.5	
	NP-CPGB080204TA2					★								7.94	2.38	0.4	1.8	3.5	
	NP-CPGB080208TA2					★								7.94	2.38	0.8	2.0	3.5	
	NP-CPGB080212TA2					★								7.94	2.38	1.2	2.2	3.5	
	NP-CPGB090304TA2		★		★	★								9.525	3.18	0.4	1.8	4.5	
	NP-CPGB090308TA2		★		★	★								9.525	3.18	0.8	2.0	4.5	
	NP-CPGB090312TA2		★		★	★								9.525	3.18	1.2	2.2	4.5	
	NP-CPGB080202SE2										★			7.94	2.38	0.2	1.7	3.5	
	NP-CPGB080204SE2										★			7.94	2.38	0.4	1.8	3.5	
	NP-CPGB090302SE2										★			9.525	3.18	0.2	1.7	4.5	
	NP-CPGB090304SE2										★			9.525	3.18	0.4	1.8	4.5	
	NP-CPGB090308SE2										★			9.525	3.18	0.8	2.0	4.5	



E007  
E008

● = NEW

PCBN

B

PCBN TURNING INSERTS

POSI 11°

WITH HOLE

C

D

R

S

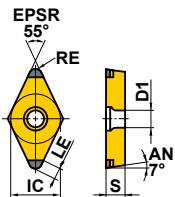
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V

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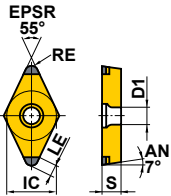

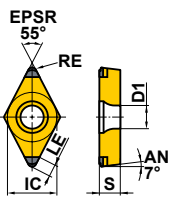

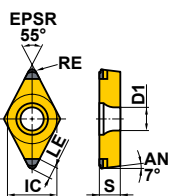

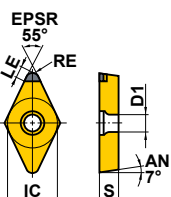
# PCBN TURNING INSERTS [POSITIVE]

## 55° DC TYPE INSERTS WITH HOLE

Work Material	H	Hardened Materials									Cutting Conditions (Guide) :									
	K	Cast Iron									● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting									
	S	Heat-resistant Alloy, Titanium Alloy									Honing (Last letter of order number) : Please refer to page B021									
		Sintered Alloy																		
Shape	Order Number	Coated PCBN					PCBN					Dimensions (mm)					Geometry	Applicable Holder Page		
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S			RE	LE
NEW PETIT CUT	NP-DCGW070202GS2	●	●	●										6.35	2.38	0.2	2.2	2.8		C025 D011 D026 E010 E011 E031 E033
	NP-DCGW070204GS2	●	●	●		★				●				6.35	2.38	0.4	2.1	2.8		
	NP-DCGW070208GS2	●	●	●							★			6.35	2.38	0.8	2.0	2.8		
	NP-DCGW11T302GS2	●	●	●							★			9.525	3.97	0.2	2.2	4.4		
	NP-DCGW11T304GS2	●	●	●		●					●			9.525	3.97	0.4	2.1	4.4		
	NP-DCGW11T304GS2										● ●			9.525	3.97	0.4	1.5	4.4		
	NP-DCGW11T308GS2	●	●	●		●					●			9.525	3.97	0.8	2.0	4.4		
	NP-DCGW11T308GS2										● ●			9.525	3.97	0.8	1.7	4.4		
	NP-DCGW070202GA2	●			●				●					6.35	2.38	0.2	2.2	2.8		
	NP-DCGW070204GA2	●			● ●				●					6.35	2.38	0.4	2.1	2.8		
	NP-DCGW070208GA2	★			●									6.35	2.38	0.8	2.0	2.8		
	NP-DCGW11T302GA2	●			●				●					9.525	3.97	0.2	2.2	4.4		
	NP-DCGW11T304GA2	●			● ●				●					9.525	3.97	0.4	2.1	4.4		
	NP-DCGW11T308GA2	●			● ●				●					9.525	3.97	0.8	2.0	4.4		
	NP-DCGW11T304GH2				★ ★ ●									9.525	3.97	0.4	2.1	4.4		
	NP-DCGW11T308GH2				★ ★ ●									9.525	3.97	0.8	2.0	4.4		
	<b>NEW</b> NP-DCGW11T304VA2	●												9.525	3.97	0.4	2.1	4.4		
	<b>NEW</b> NP-DCGW11T308VA2	●												9.525	3.97	0.8	2.0	4.4		
	NP-DCGW070202FS2	●		●					●					6.35	2.38	0.2	2.2	2.8		
	NP-DCGW070204FS2	●		● ●		●	●		● ●					6.35	2.38	0.4	2.1	2.8		
	NP-DCGW070208FS2	★		★			★		●					6.35	2.38	0.8	2.0	2.8		
	NP-DCGW11T302FS2	●		● ●					●					9.525	3.97	0.2	2.2	4.4		
	NP-DCGW11T304FS2	●		● ● ●					●					9.525	3.97	0.4	2.1	4.4		
	NP-DCGW11T308FS2	●		● ● ●		★	●		●					9.525	3.97	0.8	2.0	4.4		
	NP-DCGW11T304FA2										★ ●			9.525	3.97	0.4	1.5	4.4		
	NP-DCGW11T308FA2										● ●			9.525	3.97	0.8	1.7	4.4		
	NP-DCGW070204TA2			● ●			● ●							6.35	2.38	0.4	2.1	2.8		
	NP-DCGW070208TA2			●			★							6.35	2.38	0.8	2.0	2.8		
	NP-DCGW11T304TA2	★		★ ●		★ ●			●					9.525	3.97	0.4	2.1	4.4		
	NP-DCGW11T308TA2	★		★ ●		★ ●			●					9.525	3.97	0.8	2.0	4.4		
	NP-DCGW11T304TH2			★ ●			●							9.525	3.97	0.4	2.1	4.4		
	NP-DCGW11T308TH2			★ ●			●							9.525	3.97	0.8	2.0	4.4		
	NP-DCGW070204SF2								●					6.35	2.38	0.4	2.1	2.8		
	NP-DCGW070208SF2								●					6.35	2.38	0.8	2.0	2.8		
	NP-DCGW11T302SF2										★			9.525	3.97	0.2	2.2	4.4		
	NP-DCGW11T304SF2										●			9.525	3.97	0.4	2.1	4.4		
	NP-DCGW11T308SF2										●			9.525	3.97	0.8	2.0	4.4		

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.

Work Material	H	Hardened Materials											Cutting Conditions (Guide) :									
	K	Cast Iron											● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting									
Shape	S	Heat-resistant Alloy, Titanium Alloy	Coated PCBN					PCBN					Dimensions (mm)					Geometry	Applicable Holder Page			
		Sintered Alloy	BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	NEW MB8120	MB8130	MB4120	MB710	MB730	IC	S			RE	LE	D1
NEW PETIT CUT 	NP-DCGW070204SE2														●	6.35	2.38	0.4	2.1	2.8		C025 D011 D026 E010 E011 E031 E033
	NP-DCGW070208SE2														★	6.35	2.38	0.8	2.0	2.8		
	NP-DCGW11T302SE2														●	9.525	3.97	0.2	2.2	4.4		
	NP-DCGW11T304SE2														●	9.525	3.97	0.4	2.1	4.4		
	NP-DCGW11T308SE2														●	9.525	3.97	0.8	2.0	4.4		
NEW PETIT CUT 	BF-DCGT11T304TS2	●		●											●	9.525	3.97	0.4	2.1	4.4		C025 D011 D026 E010 E011 E031 E033
	BF-DCGT11T308TS2	●		●											●	9.525	3.97	0.8	2.0	4.4		
(With Breaker)																						
NEW PETIT CUT 	BM-DCGT11T304TA2	●		●											●	9.525	3.97	0.4	2.1	4.4		C025 D011 D026 E010 E011 E031 E033
	BM-DCGT11T308TA2	●		●											●	9.525	3.97	0.8	2.0	4.4		
(With Breaker)																						
NEW PETIT CUT 	NP-DCGW11T302GS													★ ★	9.525	3.97	0.2	1.4	4.4		C025 D011 D026 E010 E011 E031 E033	

● = NEW

PCBN

B

PCBN TURNING INSERTS

POSI 7°

WITH HOLE

C

D

R

S

T

V

W

# PCBN TURNING INSERTS [POSITIVE]

## 60° TC TYPE INSERTS WITH HOLE

Work Material	H	Hardened Materials												Cutting Conditions (Guide) :							
	K	Cast Iron												●	Stable Cutting	●	General Cutting	✱	Unstable Cutting		
	S	Heat-resistant Alloy, Titanium Alloy												Honing (Last letter of order number) :							
		Sintered Alloy												Please refer to page B021							
Shape	Order Number	Coated PCBN			PCBN			Dimensions (mm)					Geometry	Applicable Holder Page							
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	MB8120	MB8130	MB4120			MB710	MB730	IC	S	RE	LE	D1
NEW PETIT CUT	NP-TCGW090204GS3		★		★										5.56	2.38	0.4	1.6	2.5		C029 E030
	NP-TCGW090208GS3		★												5.56	2.38	0.8	1.7	2.5		
	NP-TCGW110202GS3		★												6.35	2.38	0.2	1.5	2.8		
	NP-TCGW110204GS3		★								★				6.35	2.38	0.4	1.6	2.8		
	NP-TCGW110208GS3		★			★					★				6.35	2.38	0.8	1.7	2.8		
	NP-TCGW130304GS3		★												7.94	3.18	0.4	1.6	3.4		
	NP-TCGW130308GS3		★												7.94	3.18	0.8	1.7	3.4		
	NP-TCGW16T304GS3		★									□ □			9.525	3.97	0.4	1.6	4.4		
	NP-TCGW16T308GS3		★									□ ●			9.525	3.97	0.8	1.7	4.4		
	NP-TCGW110204FS3						★				●				6.35	2.38	0.4	1.6	2.8		
	NP-TCGW110208FS3						★				●				6.35	2.38	0.8	1.7	2.8		
	NP-TCGW16T304FS3											□ □			9.525	3.97	0.4	1.6	4.4		
	NP-TCGW16T308FS3											□ □			9.525	3.97	0.8	1.7	4.4		
	NP-TCGW110204SF3										★				6.35	2.38	0.4	1.6	2.8		
	NP-TCGW110208SF3										★				6.35	2.38	0.8	1.7	2.8		
	NP-TCGW110204SE3										★				6.35	2.38	0.4	1.6	2.8		
NP-TCGW110208SE3										★				6.35	2.38	0.8	1.7	2.8			
NEW PETIT CUT	NP-TCGW090204GS											● □		5.56	2.38	0.4	1.6	2.5		C029 E030	
	NP-TCGW090208GS										□ □			5.56	2.38	0.8	1.7	2.5			
	NP-TCGW110204GS										● ●			6.35	2.38	0.4	1.6	2.8			
	NP-TCGW110208GS										● □			6.35	2.38	0.8	1.7	2.8			
	NP-TCGW090204FS										● ●			5.56	2.38	0.4	1.6	2.5			
	NP-TCGW090208FS										□ □			5.56	2.38	0.8	1.7	2.5			
	NP-TCGW110204FS										● ●			6.35	2.38	0.4	1.6	2.8			
	NP-TCGW110208FS										□ □			6.35	2.38	0.8	1.7	2.8			

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.

□ : Non stock, produced to order only.

PCBN

B

PCBN TURNING INSERTS

POST 7°

WITH HOLE

C

D

R

S

T

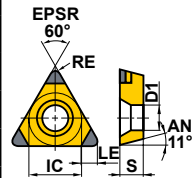
V

W



# 60° TP TYPE INSERTS WITH HOLE

Work Material	H	Hardened Materials	Cutting Conditions (Guide) :										Geometry	Applicable Holder Page						
	K	Cast Iron	● : Stable Cutting   ● : General Cutting   ✱ : Unstable Cutting Honing (Last letter of order number) : Please refer to page B021																	
Shape	S	Heat-resistant Alloy, Titanium Alloy	Coated PCBN					PCBN					Dimensions (mm)					E009		
		Sintered Alloy	NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S		RE	LE
NEW PETIT CUT			★	★	★		★								4.76	2.38	0.4	1.6	2.4	E009
	NP-TPGB080204GS3		★	★	★		★								4.76	2.38	0.8	1.7	2.4	
	NP-TPGB090202GS3											★			5.56	2.38	0.2	1.5	2.9	
	NP-TPGB090204GS3		★	★	★							★			5.56	2.38	0.4	1.6	2.9	
	NP-TPGB090208GS3		★	★	★										5.56	2.38	0.8	1.7	2.9	
	NP-TPGB110302GS3		★	★	★							★			6.35	3.18	0.2	1.5	3.4	
	NP-TPGB110304GS3		★	★	★		★					★			6.35	3.18	0.4	1.6	3.4	
	NP-TPGB110308GS3		★	★	★		★					★			6.35	3.18	0.8	1.7	3.4	
	NP-TPGB160304GS3		★	★	★										9.525	3.18	0.4	1.6	4.4	
	NP-TPGB160308GS3		★	★	★										9.525	3.18	0.8	1.7	4.4	
	NP-TPGB080204GA3								●						4.76	2.38	0.4	1.6	2.4	
	NP-TPGB080208GA3								●						4.76	2.38	0.8	1.7	2.4	
	NP-TPGB090204GA3			★		★	●			●					5.56	2.38	0.4	1.6	2.9	
	NP-TPGB090208GA3			★		★	●			★					5.56	2.38	0.8	1.7	2.9	
	NP-TPGB110302GA3			★		★				★					6.35	3.18	0.2	1.5	3.4	
	NP-TPGB110304GA3			●		●	●			●					6.35	3.18	0.4	1.6	3.4	
	NP-TPGB110308GA3			●		●	●			●					6.35	3.18	0.8	1.7	3.4	
	NP-TPGB160304GA3			●		●	★			★					9.525	3.18	0.4	1.6	4.4	
	NP-TPGB160308GA3			●		●	★			★					9.525	3.18	0.8	1.7	4.4	
	NP-TPGB160304GH3					★	★	★							9.525	3.18	0.4	1.6	4.4	
	NP-TPGB160308GH3					★	★	★							9.525	3.18	0.8	1.7	4.4	
	<b>NEW</b> NP-TPGB110304VA3			●											6.35	3.18	0.4	1.6	3.4	
	<b>NEW</b> NP-TPGB110308VA3			●											6.35	3.18	0.8	1.7	3.4	
	NP-TPGB090202FS3												★		5.56	2.38	0.2	1.5	2.9	
	NP-TPGB090204FS3								★				★		5.56	2.38	0.4	1.6	2.9	
	NP-TPGB110302FS3			★	★	★			★	★			★		6.35	3.18	0.2	1.5	3.4	
	NP-TPGB110304FS3			★	★	★	●		★	●			★		6.35	3.18	0.4	1.6	3.4	
	NP-TPGB110308FS3			★	★	★	●		★	●			★		6.35	3.18	0.8	1.7	3.4	
	NP-TPGB160304FS3						●								9.525	3.18	0.4	1.6	4.4	
	NP-TPGB160308FS3						●								9.525	3.18	0.8	1.7	4.4	
	NP-TPGB080204TA3							★			●				4.76	2.38	0.4	1.6	2.4	
	NP-TPGB080208TA3							★			★				4.76	2.38	0.8	1.7	2.4	
	NP-TPGB090204TA3							★			●				5.56	2.38	0.4	1.6	2.9	
NP-TPGB090208TA3							★			★				5.56	2.38	0.8	1.7	2.9		
NP-TPGB110304TA3			★		★	●			●	●				6.35	3.18	0.4	1.6	3.4		
NP-TPGB110308TA3			★		★	★			★	★				6.35	3.18	0.8	1.7	3.4		
NP-TPGB160304TA3					★	●			★	★				9.525	3.18	0.4	1.6	4.4		
NP-TPGB160308TA3					★	●			★	★				9.525	3.18	0.8	1.7	4.4		
NP-TPGB160304TH3					★	★			★					9.525	3.18	0.4	1.6	4.4		
NP-TPGB160308TH3					★	★			★					9.525	3.18	0.8	1.7	4.4		



E009

● = NEW

PCBN

B

PCBN TURNING INSERTS

POSI 11°

WITH HOLE

C

D

R

S

T

V

W

# PCBN TURNING INSERTS [POSITIVE]

## 60° TP TYPE INSERTS WITH HOLE

PCBN

B

PCBN TURNING INSERTS

POSI 11°

WITH HOLE

C

D


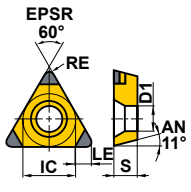
R

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V

W

Work Material	H	Hardened Materials											Cutting Conditions (Guide) :					Geometry	Applicable Holder Page			
	K	Cast Iron											● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting									
	S	Heat-resistant Alloy, Titanium Alloy											Honing (Last letter of order number) : Please refer to page B021									
	Sintered Alloy																					
Shape	Order Number	Coated PCBN					PCBN					Dimensions (mm)					Geometry	Applicable Holder Page				
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S			RE	LE	D1	
NEW PETIT CUT 	NP-TPGB090202SF3													★		5.56	2.38	0.2	1.5	2.9		E009
	NP-TPGB090204SF3													★		5.56	2.38	0.4	1.6	2.9		
	NP-TPGB110302SF3													★		6.35	3.18	0.2	1.5	3.4		
	NP-TPGB110304SF3													★		6.35	3.18	0.4	1.6	3.4		
	NP-TPGB110308SF3													★		6.35	3.18	0.8	1.7	3.4		
	NP-TPGB090202SE3													★		5.56	2.38	0.2	1.5	2.9		
	NP-TPGB090204SE3													★		5.56	2.38	0.4	1.6	2.9		
	NP-TPGB110302SE3													★		6.35	3.18	0.2	1.5	3.4		
	NP-TPGB110304SE3													★		6.35	3.18	0.4	1.6	3.4		
	NP-TPGB110308SE3													★		6.35	3.18	0.8	1.7	3.4		

● = NEW

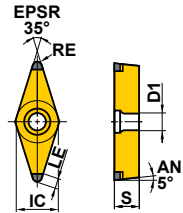
● : Inventory maintained. ★ : Inventory maintained in Japan.





# 35° VB TYPE INSERTS WITH HOLE

Work Material	H	Hardened Materials											Cutting Conditions (Guide) :					Geometry	Applicable Holder Page	
	K	Cast Iron											● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting							
Shape	S	Heat-resistant Alloy, Titanium Alloy	Coated PCBN					PCBN					Dimensions (mm)							
		Sintered Alloy	NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S			RE
NEW PETIT CUT			★	★	★										6.35	3.18	0.2	2.5	2.85	D012 D013 E013 E014 H013
			★	★	★							★			6.35	3.18	0.4	2.5	2.85	
													★		6.35	3.18	0.4	1.3	2.85	
			★	★	★								★		6.35	3.18	0.8	2.0	2.85	
														★	6.35	3.18	0.8	1.4	2.85	
			●	★	●										9.525	4.76	0.2	2.5	4.43	
			●	●	●		★					●			9.525	4.76	0.4	2.5	4.43	
													★	●	9.525	4.76	0.4	1.3	4.43	
			●	●	●		★					●			9.525	4.76	0.8	2.0	4.43	
													★	●	9.525	4.76	0.8	1.4	4.43	
			●			●			★						6.35	3.18	0.2	2.5	2.85	
			●			●	●		★						6.35	3.18	0.4	2.5	2.85	
			★			★	★		★						6.35	3.18	0.8	2.0	2.85	
			★			★			★						9.525	4.76	0.2	2.5	4.43	
			●			●	●		★						9.525	4.76	0.4	2.5	4.43	
			●			●	●		★						9.525	4.76	0.8	2.0	4.43	
						★	★	★							9.525	4.76	0.4	2.5	4.43	
						★	★	●							9.525	4.76	0.8	2.0	4.43	
		NEW		●											9.525	4.76	0.4	2.5	4.43	
		NEW		●											9.525	4.76	0.8	2.0	4.43	
			●		●				★						6.35	3.18	0.2	2.5	2.85	
			★		★				★				★		6.35	3.18	0.4	2.5	2.85	
			★		★				★				★		6.35	3.18	0.8	2.0	2.85	
			★		★				★						9.525	4.76	0.2	2.5	4.43	
							●					●			9.525	4.76	0.4	2.5	4.43	
							●					●			9.525	4.76	0.8	2.0	4.43	
									★						6.35	3.18	0.4	2.5	2.85	
									★						6.35	3.18	0.8	2.0	2.85	
			●		●	★			★						9.525	4.76	0.4	2.5	4.43	
			★		★	★			★						9.525	4.76	0.8	2.0	4.43	
						★	★								9.525	4.76	0.4	2.5	4.43	
						★	★								9.525	4.76	0.8	2.0	4.43	
													★		6.35	3.18	0.4	2.5	2.85	
													★		6.35	3.18	0.8	2.0	2.85	
												●			9.525	4.76	0.4	2.5	4.43	
											★			9.525	4.76	0.8	2.0	4.43		
											★			6.35	3.18	0.4	2.5	2.85		
											★			6.35	3.18	0.8	2.0	2.85		
											●			9.525	4.76	0.4	2.5	4.43		
											★			9.525	4.76	0.8	2.0	4.43		



PCBN

B

PCBN TURNING INSERTS

POSI 5°

WITH HOLE

C

D

R

S

T

V

W

● = NEW

GRADES > B004  
IDENTIFICATION > B002

B059

# PCBN TURNING INSERTS [POSITIVE]

## 35° VC TYPE INSERTS WITH HOLE

PCBN

B

PCBN TURNING INSERTS

POSITIVE  
7°

WITH HOLE

C

D

R

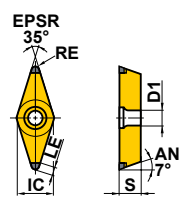
S

T

V

W

Work Material	H	Hardened Materials	●	●	●	●	●	✱	●	●	●	Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting Honing (Last letter of order number) : Please refer to page B021	Dimensions (mm)					Geometry	Applicable Holder Page
	K	Cast Iron											IC	S	RE	LE	D1		
	S	Heat-resistant Alloy, Titanium Alloy																	
Shape	Order Number	Coated PCBN					PCBN												
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	NEW MB8120	MB8130	MB4120	MB710	MB730					
NEW PETIT CUT	NP-VCGW160404GS2	●		●	●										9.525	4.76	0.4	2.5	4.4
	NP-VCGW160408GS2	●		●	●										9.525	4.76	0.8	2.0	4.4
	NP-VCGW160404GA2		●			●	●								9.525	4.76	0.4	2.5	4.4
	NP-VCGW160408GA2		●			●	●								9.525	4.76	0.8	2.0	4.4
	NP-VCGW160404GH2					★	★	★							9.525	4.76	0.4	2.5	4.4
	NP-VCGW160408GH2					★	★	★							9.525	4.76	0.8	2.0	4.4
	NEW NP-VCGW160404VA2		●												9.525	4.76	0.4	2.5	4.4
	NEW NP-VCGW160408VA2		●												9.525	4.76	0.8	2.0	4.4
	NP-VCGW160404FS2					●	●			★					9.525	4.76	0.4	2.5	4.4
	NP-VCGW160408FS2					●	●			★					9.525	4.76	0.8	2.0	4.4
	NP-VCGW160404TS2					★									9.525	4.76	0.4	2.5	4.4
	NP-VCGW160408TS2					★									9.525	4.76	0.8	2.0	4.4
	NP-VCGW160404TA2			★				★	★						9.525	4.76	0.4	2.5	4.4
	NP-VCGW160408TA2			★				★	★						9.525	4.76	0.8	2.0	4.4
	NP-VCGW160404TH2							★	★						9.525	4.76	0.4	2.5	4.4
NP-VCGW160408TH2							★	★						9.525	4.76	0.8	2.0	4.4	

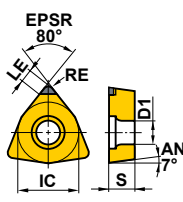


C030  
C031  
E034  
E035

● = NEW

## 80° WC TYPE INSERTS WITH HOLE

Work Material	H	Hardened Materials	●	●	●	●	●	✱	●	●	●	Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting Honing (Last letter of order number) : Please refer to page B021	Dimensions (mm)					Geometry	Applicable Holder Page
	K	Cast Iron											IC	S	RE	LE	D1		
	S	Heat-resistant Alloy, Titanium Alloy																	
Shape	Order Number	Coated PCBN					PCBN												
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	NEW MB8120	MB8130	MB4120	MB710	MB730					
NEW PETIT CUT	NP-WCMWL30204FA												★	4.76	2.38	0.4	1.8	2.3	
	NP-WCMWL30208FA												★	4.76	2.38	0.8	1.9	2.3	


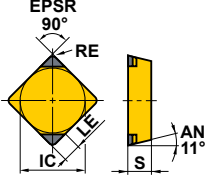

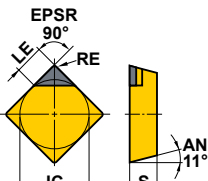


E029

● = NEW

● : Inventory maintained. ★ : Inventory maintained in Japan.

# 90° SP TYPE INSERTS WITHOUT HOLE

Work Material	H	Hardened Materials	● ● ● ● ● ✱	● ● ● ● ● ✱	● ● ● ● ● ✱	● ● ● ● ● ✱	● ● ● ● ● ✱	● ● ● ● ● ✱	● ● ● ● ● ✱	Cutting Conditions (Guide) :				Geometry	Applicable Holder Page				
	K	Cast Iron								● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting									
Shape	Order Number	Coated PCBN					PCBN					Dimensions (mm)							
		BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MB710	MB730	IC	S	RE	LE	
NEW PETIT CUT <b>NEW</b> 	<b>NP-SPGN120412GS2</b>						★							12.7	4.76	1.2	2.5		-
	<b>SPGN090304</b>										★		9.525	3.18	0.4	4.0		-	
	<b>SPGN090308</b>										★		9.525	3.18	0.8	4.1			
	<b>SPGN120304</b>										★ ★		12.7	3.18	0.4	4.0			
	<b>SPGN120308</b>										★ ★		12.7	3.18	0.8	4.1			

● = NEW

PCBN

B

PCBN TURNING INSERTS

POSI 11°

WITHOUT HOLE

C

D

R

S

T

V

W

GRADES > B004  
IDENTIFICATION > B002

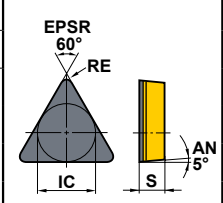
B061

# PCBN TURNING INSERTS [POSITIVE]

## 60° TB TYPE INSERTS WITHOUT HOLE

Work Material	H	Hardened Materials	Cutting Conditions (Guide) :														
	K	Cast Iron	●	●	●	●	●	●	●	●	●	●					
S	Heat-resistant Alloy, Titanium Alloy	●	●	●	●	●	●	●	●	●	●						
	Sintered Alloy	●	●	●	●	●	●	●	●	●	●						
Shape	Order Number	Coated PCBN					PCBN					Dimensions (mm)				Geometry	Applicable Holder Page
		NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	IC	S	RE	LE		
	TBGN060104																
	TBGN060108																

● = NEW



PCBN

B

PCBN TURNING INSERTS

POSI 5° 11° WITHOUT HOLE

C

D

R

S

T

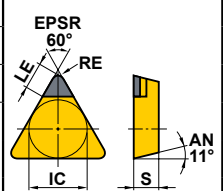
V

W

## 60° TP TYPE INSERTS WITHOUT HOLE


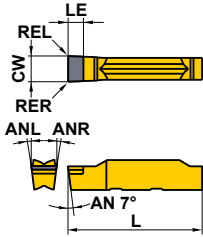
Work Material	H	Hardened Materials	Cutting Conditions (Guide) :														
	K	Cast Iron	●	●	●	●	●	●	●	●	●	●					
S	Heat-resistant Alloy, Titanium Alloy	●	●	●	●	●	●	●	●	●	●						
	Sintered Alloy	●	●	●	●	●	●	●	●	●	●						
Shape	Order Number	Coated PCBN					PCBN					Dimensions (mm)				Geometry	Applicable Holder Page
		NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	IC	S	RE	LE		
	TPGN110304																
	TPGN160304																
	TPGN160308																

● = NEW



● : Inventory maintained. ★ : Inventory maintained in Japan.

# GY TYPE INSERTS WITHOUT HOLE

Work Material	H	Hardened Materials											Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✦ : Unstable Cutting								
	K	Cast Iron																			
	S	Heat-resistant Alloy, Titanium Alloy																			
		Sintered Alloy																			
Shape	Order Number	Coated PCBN			PCBN			Dimensions (mm)					Geometry	Applicable Holder Page							
		NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	NEW MB8110	NEW MB8120	NEW MB8130	MB4120			MB710	MB730	CW	RER REL	L	LE	ANR ANL
	<b>GY1G0200D020N-GFGS</b>			●											2.00	0.2	20.7	2.7	3°		F018 -093
	<b>GY1G0239E020N-GFGS</b>			●											2.39	0.2	20.7	2.7	7°		
	<b>GY1G0250E020N-GFGS</b>			●											2.5	0.2	20.7	2.7	7°		
	<b>GY1G0300F020N-GFGS</b>			●											3.00	0.2	20.7	2.7	7°		
	<b>GY1G0318F020N-GFGS</b>			●											3.18	0.2	20.7	2.7	7°		
	<b>GY1G0400G020N-GFGS</b>			●											4.00	0.2	25.65	2.7	7°		
	<b>GY1G0475H020N-GFGS</b>			●											4.75	0.2	25.65	2.7	7°		
	<b>GY1G0500H020N-GFGS</b>			●											5.00	0.2	25.65	2.7	7°		
	<b>GY1G0600J020N-GFGS</b>			●											6.00	0.2	25.65	2.7	7°		

● = NEW

PCBN

B

PCBN TURNING INSERTS

POSI 7°

WITHOUT HOLE

C

D

R

S

T

V


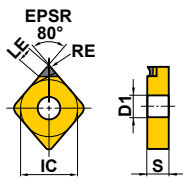

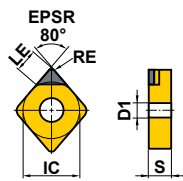
W

GRADES > B004  
IDENTIFICATION > B002

B063

# PCD TURNING INSERTS [NEGATIVE]

## 80° CN TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :					
				● : Stable Cutting	● : General Cutting	✖ : Unstable Cutting			
Shape	Order Number	PCD	Dimensions (mm)					Geometry	Applicable Holder Page
		MD220	IC	S	RE	LE	D1		
 (With Breaker)	NP-CNMM120402R-F	★	12.7	4.76	0.2	1.7	5.16	 Right hand insert shown.	C008 C009 E015 E038 H006 -008
	NP-CNMM120404R-F	★	12.7	4.76	0.4	1.8	5.16		
	NP-CNMM120408R-F	★	12.7	4.76	0.8	2.0	5.16		
	CNMA120404	★	12.7	4.76	0.4	3.6	5.16	 Right hand insert shown.	C008 C009 E015 E038 H006 -008
	CNMA120408	★	12.7	4.76	0.8	3.6	5.16		

PCD

B

PCD TURNING INSERTS

NEG

WITH HOLE

C

D

R


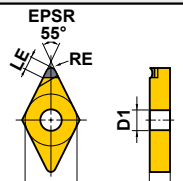

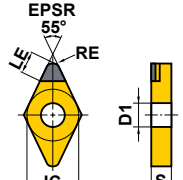
S

T

V


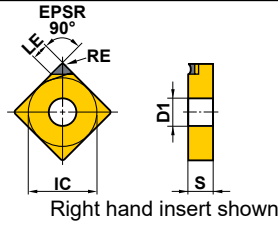
W

## 55° DN TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :					
				● : Stable Cutting	● : General Cutting	✖ : Unstable Cutting			
Shape	Order Number	PCD	Dimensions (mm)					Geometry	Applicable Holder Page
		MD220	IC	S	RE	LE	D1		
 (With Breaker)	NP-DNMM150402R-F	★	12.7	4.76	0.2	2.2	5.16	 Right hand insert shown.	C010 C011 E015 E038 -040 H009 H010
	NP-DNMM150404R-F	★	12.7	4.76	0.4	2.1	5.16		
	NP-DNMM150408R-F	★	12.7	4.76	0.8	2.0	5.16		
	DNMA150404	★	12.7	4.76	0.4	2.9	5.16	 Right hand insert shown.	C010 C011 E015 E038 -040 H009 H010
	DNMA150408	★	12.7	4.76	0.8	2.4	5.16		

★ : Inventory maintained in Japan.

# 90° SN TYPE INSERTS WITH HOLE


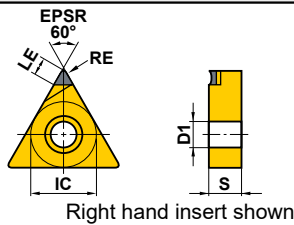

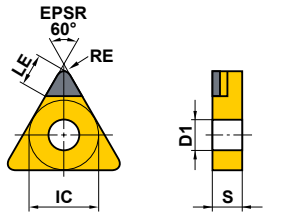
Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :					
				● : Stable Cutting	● : General Cutting	✖ : Unstable Cutting			
Shape	Order Number	PCD	Dimensions (mm)					Geometry	Applicable Holder Page
		MD220	IC	S	RE	LE	D1		
NEW PETIT CUT  (With Breaker)	NP-SNMM120404R-F	★	12.7	4.76	0.4	2.0	5.16		C012 -015 E016 E037
	NP-SNMM120408R-F	★	12.7	4.76	0.8	2.2	5.16		

PCD

B

PCD TURNING INSERTS

# 60° TN TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :					
				● : Stable Cutting	● : General Cutting	✖ : Unstable Cutting			
Shape	Order Number	PCD	Dimensions (mm)					Geometry	Applicable Holder Page
		MD220	IC	S	RE	LE	D1		
NEW PETIT CUT  (With Breaker)	NP-TNMM160402R-F	★	9.525	4.76	0.2	1.5	3.81		C016 -018 E016 E037
	NP-TNMM160404R-F	★	9.525	4.76	0.4	1.6	3.81		
	NP-TNMM160408R-F	★	9.525	4.76	0.8	1.7	3.81		
	TNGA160402	★	9.525	4.76	0.2	3.1	3.81		C016 -018 E016 E037
	TNGA160404	★	9.525	4.76	0.4	2.9	3.81		
	TNGA160408	★	9.525	4.76	0.8	2.8	3.81		

NEG

WITH HOLE

C

D

R

S

T


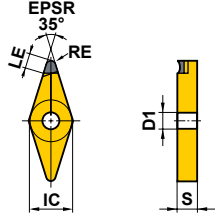

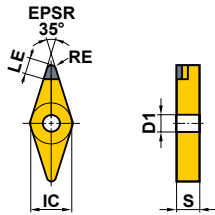
V

W

# PCD TURNING INSERTS [NEGATIVE]



## 35° VN TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :					
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting			
Shape	Order Number	PCD	Dimensions (mm)					Geometry	Applicable Holder Page
		MD220	IC	S	RE	LE	D1		
 NEW PETIT CUT	NP-VNMM160402R-F	★	9.525	4.76	0.2	2.5	3.81	 Right hand insert shown.	C019 -021 E017
	NP-VNMM160404R-F	★	9.525	4.76	0.4	2.5	3.81		
	NP-VNMM160408R-F	★	9.525	4.76	0.8	2.0	3.81		
(With Breaker)									
 VNGA160404 VNGA160408	VNGA160404	★	9.525	4.76	0.4	2.6	3.81	 Right hand insert shown.	C019 -021 E017
	VNGA160408	★	9.525	4.76	0.8	1.8	3.81		

PCD

B

PCD TURNING INSERTS

NEG

WITH HOLE

C

D

R

S

T

V


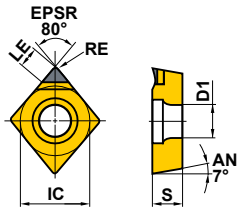

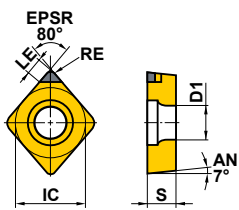

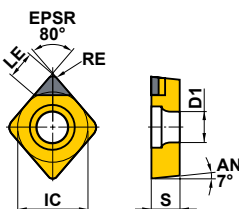
W

● : Inventory maintained. ★ : Inventory maintained in Japan.




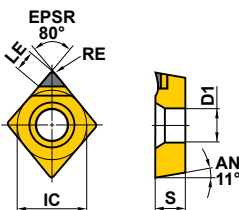

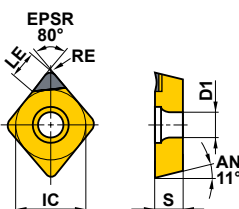
# PCD TURNING INSERTS [POSITIVE]

## 80° CC TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :					PCD	Dimensions (mm)					Geometry	Applicable Holder Page
				●	●	●	●	●		IC	S	RE	LE	D1		
NEW PETIT CUT  (With Breaker)		NP-CCMH060202	★	●	●	●	●	●	6.35	2.38	0.2	1.7	2.8		C024 D010 E007 E008 E032 E036	
		NP-CCMH060204	★	●	●	●	●	●	6.35	2.38	0.4	1.8	2.8			
NEW PETIT CUT 	*	NP-CCMW03S102	●	●	●	●	●	●	3.57	1.39	0.2	1.1	2.0		E018	
	*	NP-CCMW03S104	★	●	●	●	●	●	3.57	1.39	0.4	1.0	2.0			
	*	NP-CCMW04T002	●	●	●	●	●	●	4.37	1.79	0.2	1.5	2.4			
	*	NP-CCMW04T004	★	●	●	●	●	●	4.37	1.79	0.4	1.4	2.4			
		CCMW060202	★	●	●	●	●	●	6.35	2.38	0.2	2.9	2.8		C024 D010 E007 E008 E032 E036	
		CCMW060204	★	●	●	●	●	●	6.35	2.38	0.4	2.9	2.8			
		CCMW09T302	★	●	●	●	●	●	9.525	3.97	0.2	3.3	4.4			
		CCMW09T304	★	●	●	●	●	●	9.525	3.97	0.4	3.3	4.4			

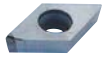
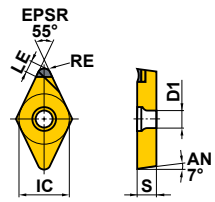
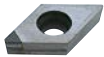
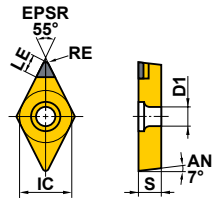
\* Diameter of inscribed circle is special. (For SCLC type)

## 80° CP TYPE INSERTS WITH HOLE


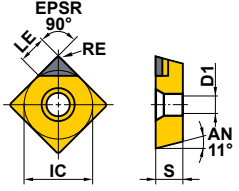
Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :					PCD	Dimensions (mm)					Geometry	Applicable Holder Page
				●	●	●	●	●		IC	S	RE	LE	D1		
NEW PETIT CUT  (With Breaker)		NP-CPMH080202	★	●	●	●	●	●	7.94	2.38	0.2	1.7	3.5		E007 E008	
		NP-CPMH080204	★	●	●	●	●	●	7.94	2.38	0.4	1.8	3.5			
		NP-CPMH090302	★	●	●	●	●	●	9.525	3.18	0.2	1.7	4.5			
		NP-CPMH090304	★	●	●	●	●	●	9.525	3.18	0.4	1.8	4.5			
 (With Breaker)		CPGT080202	★	●	●	●	●	●	7.94	2.38	0.2	3.7	3.4		-	
		CPGT080204	★	●	●	●	●	●	7.94	2.38	0.4	3.6	3.4			
		CPGT090302	★	●	●	●	●	●	9.525	3.18	0.2	3.3	4.4			
		CPGT090304	★	●	●	●	●	●	9.525	3.18	0.4	3.3	4.4			

# PCD TURNING INSERTS [POSITIVE]

## 55° DC TYPE INSERTS WITH HOLE


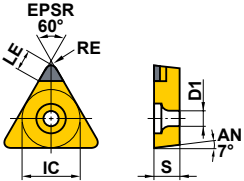

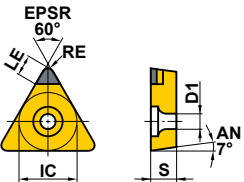
Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :					
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting			
Shape	Order Number	PCD	Dimensions (mm)					Geometry	Applicable Holder Page
		MD220	IC	S	RE	LE	D1		
 NEW PETIT CUT (With Breaker)	NP-DCMT070202R-F	★	6.35	2.38	0.2	1.4	2.8	 Left hand insert shown.	C025 D011 D026 E010 E011 E031 E033
	NP-DCMT070202L-F	★	6.35	2.38	0.2	1.4	2.8		
	NP-DCMT070204R-F	★	6.35	2.38	0.4	1.5	2.8		
	NP-DCMT070204L-F	★	6.35	2.38	0.4	1.5	2.8		
	NP-DCMT11T302R-F	★	9.525	3.97	0.2	1.4	4.4		
	NP-DCMT11T302L-F	★	9.525	3.97	0.2	1.4	4.4		
	NP-DCMT11T304R-F	★	9.525	3.97	0.4	1.5	4.4		
	NP-DCMT11T304L-F	★	9.525	3.97	0.4	1.5	4.4		
 DCMW070202 DCMW070204 DCMW11T302 DCMW11T304	DCMW070202	★	6.35	2.38	0.2	2.7	2.8		C025 D011 D026 E010 E011 E031 E033
	DCMW070204	★	6.35	2.38	0.4	2.5	2.8		
	DCMW11T302	★	9.525	3.97	0.2	3.0	4.4		
	DCMW11T304	★	9.525	3.97	0.4	2.9	4.4		

## 90° SP TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :					
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting			
Shape	Order Number	PCD	Dimensions (mm)					Geometry	Applicable Holder Page
		MD220	IC	S	RE	LE	D1		
 SPGX090304 SPGX090308	SPGX090304	★	9.525	3.18	0.4	3.7	4.8		-
	SPGX090308	★	9.525	3.18	0.8	3.8	4.8		

★ : Inventory maintained in Japan.

# 60° TC TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				PCD	Dimensions (mm)					Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting	IC		S	RE	LE	D1			
	TCMW110202	★	6.35	2.38	0.2	2.7	2.8		C029 E030						
	TCMW110204	★	6.35	2.38	0.4	2.6	2.8								
	TCGW060102	★	3.97	1.59	0.2	1.5	2.3		-						
	TCGW060104	★	3.97	1.59	0.4	1.6	2.3								
	TCGW060108	★	3.97	1.59	0.8	1.4	2.3								

PCD

B

PCD TURNING INSERTS

POSI  
7°

WITH HOLE

C

D

R

S


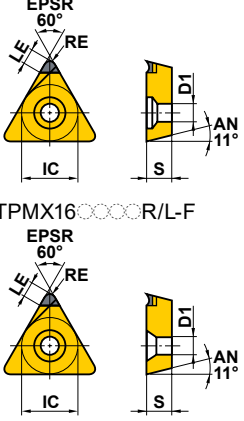
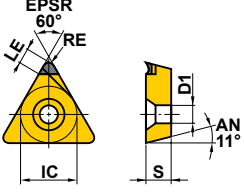
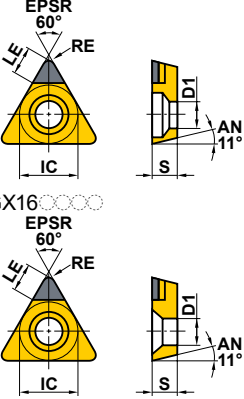
T

V

W

# PCD TURNING INSERTS [POSITIVE]

## 60° TP TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :					PCD	Dimensions (mm)					Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting	IC	S		RE	LE	D1				
<b>PCD</b> <b>B</b> PCD TURNING INSERTS 	NEW PETIT CUT		MD220	★	5.56	2.38	0.2	1.5	3.0	 NP-TPMX16○○○○R/L-F Right hand insert shown.	E009 E027					
	★	5.56		2.38	0.2	1.5	3.0									
	★	5.56		2.38	0.4	1.6	3.0									
	★	5.56		2.38	0.8	1.7	3.0									
	★	6.35		3.18	0.2	1.5	3.5									
	★	6.35		3.18	0.4	1.6	3.5									
	★	6.35		3.18	0.8	1.7	3.5									
	★	9.525		3.18	0.2	1.5	4.8									
	★	9.525		3.18	0.4	1.6	4.8									
	★	9.525		3.18	0.8	1.7	4.8									
(With Breaker) <b>POS11°</b> WITH HOLE <b>C</b> <b>D</b> <b>R</b> <b>S</b> <b>T</b>	NEW PETIT CUT		MD220	★	4.76	2.38	0.2	1.5	2.4	 Left hand insert shown.	E009					
	★	4.76		2.38	0.2	1.5	2.4									
	★	4.76		2.38	0.4	1.6	2.4									
	★	4.76		2.38	0.4	1.6	2.4									
	★	5.56		2.38	0.2	1.5	2.9									
	★	5.56		2.38	0.2	1.5	2.9									
	★	5.56		2.38	0.4	1.6	2.9									
	★	5.56		2.38	0.4	1.6	2.9									
	★	6.35		3.18	0.2	1.5	3.4									
	★	6.35		3.18	0.2	1.5	3.4									
(With Breaker) <b>T</b> <b>V</b> <b>W</b>	NEW PETIT CUT		MD220	★	4.76	2.38	0.2	1.8	2.5	 TPGX16○○○○○	E009 E027					
	★	4.76		2.38	0.4	1.7	2.5									
	★	4.76		2.38	0.8	1.4	2.5									
	★	5.56		2.38	0.2	2.7	3.0									
	★	5.56		2.38	0.4	2.6	3.0									
	★	5.56		2.38	0.8	2.3	3.0									
	★	6.35		3.18	0.2	2.7	3.5									
	★	6.35		3.18	0.4	2.6	3.5									
	★	6.35		3.18	0.8	2.3	3.5									
	★	9.525		3.18	0.4	2.9	4.8									
★	9.525	3.18	0.8	2.6	4.8											

★ : Inventory maintained in Japan.



# 35° VB TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :					PCD	Dimensions (mm)	Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✖ : Unstable Cutting						
Shape	Order Number	MD220	IC	S	RE	LE	D1	Geometry	Applicable Holder Page			
		NEW PETIT CUT	NP-VBGT110301R-F	★	6.35	3.18	0.1			2.5	2.85	
	NP-VBGT110302R-F	★	6.35	3.18	0.2	2.5	2.85					
	NP-VBGT110304R-F	★	6.35	3.18	0.4	2.5	2.85					
	NP-VBGT1103V5R-F	★	6.35	3.18	0.05	2.5	2.85					
(With Breaker)												

PCD

B

PCD TURNING INSERTS

POSI  
5°  
7°

WITH HOLE

C

D

R

S

T

V

W



# 35° VC TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :					PCD	Dimensions (mm)	Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✖ : Unstable Cutting						
Shape	Order Number	MD220	IC	S	RE	LE	D1	Geometry	Applicable Holder Page			
		NEW PETIT CUT	NP-VCGT080201R-F	★	4.76	2.38	0.1			2.5	2.4	
	NP-VCGT080202R-F	★	4.76	2.38	0.2	2.5	2.4					
	NP-VCGT080204R-F	★	4.76	2.38	0.4	2.5	2.4					
	NP-VCGT0802V5R-F	★	4.76	2.38	0.05	2.5	2.4					
	NP-VCGT110301R-F	★	6.35	3.18	0.1	2.5	2.8					
	NP-VCGT110302R-F	★	6.35	3.18	0.2	2.5	2.8					
	NP-VCGT110304R-F	★	6.35	3.18	0.4	2.5	2.8					
(With Breaker)	NP-VCGT1103V5R-F	★	6.35	3.18	0.05	2.5	2.8					
NEW	VCGW110301	★	6.35	3.18	0.1	3.1	2.8		C030 D013 E034			
	VCGW110302	★	6.35	3.18	0.2	3.0	2.8					
	VCGW110304	★	6.35	3.18	0.4	2.6	2.8					


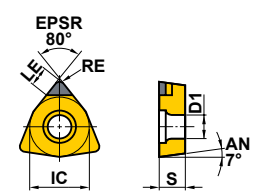
★ = NEW

GRADES > B028  
IDENTIFICATION > B002

B071

# PCD TURNING INSERTS [POSITIVE]

## 80° WC TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	PCD	Cutting Conditions (Guide) :					Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✖ : Unstable Cutting				
Shape	Order Number	MD220	Dimensions (mm)					Geometry	Applicable Holder Page	
			IC	S	RE	LE	D1			
	<b>WCMW06T304</b>	★	9.525	3.97	0.4	3.0	4.4		E029	

PCD

B

PCD TURNING INSERTS

POSITIVE  
7°  
11°

WITH HOLE

C

D

R


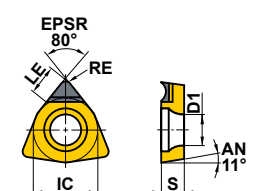
S

T

V

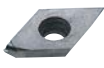
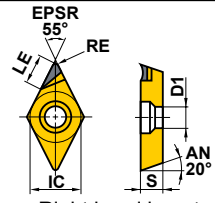
W

## 80° WP TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	PCD	Cutting Conditions (Guide) :					Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✖ : Unstable Cutting				
Shape	Order Number	MD220	Dimensions (mm)					Geometry	Applicable Holder Page	
			IC	S	RE	LE	D1			
	<b>WPGT040202</b>	★	6.35	2.38	0.2	2.9	2.8		E012	
	<b>WPGT040204</b>	★	6.35	2.38	0.4	2.9	2.8			
	<b>WPGT060302</b>	★	9.525	3.18	0.2	3.3	4.4			
	<b>WPGT060304</b>	★	9.525	3.18	0.4	3.3	4.4			
(With Breaker)										

★ : Inventory maintained in Japan.

# 55° DE TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				PCD	Dimensions (mm)					Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting	IC		S	RE	LE	D1			
 (With Breaker)			★				12.7	4.76	0.4	2.9	5.1	 Right hand insert shown.	C033		
			★				12.7	4.76	0.4	2.9	5.1				

PCD

B

PCD TURNING INSERTS

POSI  
20°WITH  
HOLE

C

D

R


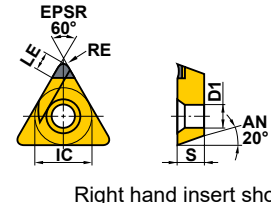

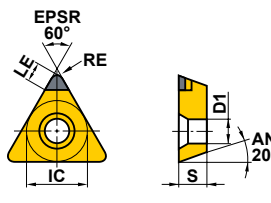
S

T

V

W

# 60° TE TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				PCD	Dimensions (mm)					Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting	IC		S	RE	LE	D1			
 (With Breaker)			★				9.525	3.18	0.2	3.8	4.4	 Right hand insert shown.	C035 E041		
			★				9.525	3.18	0.2	3.8	4.4				
			★				9.525	3.18	0.4	3.6	4.4				
			★				9.525	3.18	0.4	3.6	4.4				
			★				9.525	3.18	0.2	3.1	4.4	 Right hand insert shown.	C035 E041		
			★				9.525	3.18	0.4	2.9	4.4				

GRADES &gt; B028


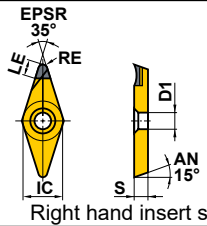
IDENTIFICATION &gt; B002

B073

# PCD TURNING INSERTS [POSITIVE]



## 35° VD TYPE INSERTS WITH HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :					Geometry	Applicable Holder Page
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting				
Shape	Order Number	PCD	Dimensions (mm)					Geometry	Applicable Holder Page	
		MD220	IC	S	RE	LE	D1			
 (With Breaker)	VDGX160302R-F	●	9.525	3.18	0.2	3.1	4.5	 Right hand insert shown.	C035	
	VDGX160304R-F	●	9.525	3.18	0.4	2.7	4.5			

PCD

B

PCD TURNING INSERTS

POSJ 15°

WITH HOLE

C

D

R

S

T


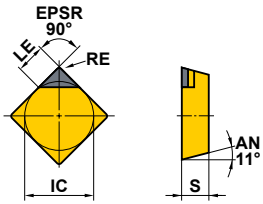
V

W

● : Inventory maintained. ★ : Inventory maintained in Japan.



# 90° SP TYPE INSERTS WITHOUT HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting		
Shape	Order Number	PCD	Dimensions (mm)				Geometry	Applicable Holder Page
		MD220	IC	S	RE	LE		
	SPGN090302	★	9.525	3.18	0.2	3.7		-
	SPGN090304	★	9.525	3.18	0.4	3.7		
	SPGN090308	★	9.525	3.18	0.8	3.8		
	SPGN120304	★	12.7	3.18	0.4	3.7		
	SPGN120308	★	12.7	3.18	0.8	3.8		
	SPGN120312	★	12.7	3.18	1.2	3.7		

PCD

B

PCD TURNING INSERTS

POSI 11°

WITHOUT HOLE

C

D

R


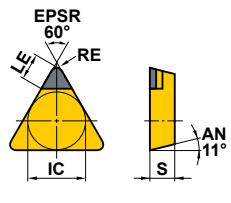
S

T

V

W

# 60° TP TYPE INSERTS WITHOUT HOLE

Work Material	N	Non-ferrous Metal	●	Cutting Conditions (Guide) :				
				● : Stable Cutting	● : General Cutting	✦ : Unstable Cutting		
Shape	Order Number	PCD	Dimensions (mm)				Geometry	Applicable Holder Page
		MD220	IC	S	RE	LE		
	TPGN110302	★	6.35	3.18	0.2	2.7		E028
	TPGN110304	★	6.35	3.18	0.4	2.6		
	TPGN110308	★	6.35	3.18	0.8	2.3		
	TPGN160302	★	9.525	3.18	0.2	3.1		
	TPGN160304	★	9.525	3.18	0.4	2.9		
	TPGN160308	★	9.525	3.18	0.8	2.6		

GRADES > B028

IDENTIFICATION > B002

B075

# Memo

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A series of horizontal dashed lines for writing, spanning the width of the page.

# Memo

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# HOW TO READ THE STANDARD OF EXTERNAL TURNING TOOLS

## ●How this section page is organised

- ① Organised according to turning insert shape.  
(Refer to the index on the next page.)

### TYPE OF TOOL HOLDER

Indicates the first four letters of the order number, as well as cutting applications.

### TITLE OF PRODUCT BY INSERT TYPE

### PRODUCT SECTION

#### EXTERNAL TURNING TOOLS

#### VN INSERTS TOOL HOLDERS

		External turning, Copying		DOUBLE CLAMP type				Finish				Light				Medium				Medium							
				FP	LP	MP	MP	FP	LP	MP	MP	FP	LP	MP	MP	FP	LP	MP	MP	FP	LP	MP	MP				
				Medium	Stainless	G Class	CBN	Standard	MM	RL		Standard	MM	RL		Standard	MM	RL		Standard	MM	RL					
Order Number	Stock	Insert Number		Dimensions (mm)				Shim	Shim Pre	Lock Pin	Lock Screw	Spring	Clamp Socket	Wrench													
DVNN2020K16	●	VN A	1604	20	20	125	44	20	10	DC5WZ	LLP13	DC3113	DC32	DC0207	TKY15F												
DVNN2525M16	●	VN G	1604	25	25	150	42	25	12.5	DC5WZ	LLP13	DC3113	DC32	DC0207	TKY15F												

\*1 Clamp Torque (N·m) : DC0207:1.5

FIGURE SHOWING THE TOOLING APPLICATION Uses illustrations and arrows to depict the available machining applications such as external turning, copying, facing, and chamfering together with cutting edge lead angles.

### GEOMETRY

### CHIPBREAKER BY CUTTING APPLICATION

		External turning, Copying		DOUBLE CLAMP type				Finish				Light				Medium				Medium							
				FP	LP	MP	MP	FP	LP	MP	MP	FP	LP	MP	MP	FP	LP	MP	MP	FP	LP	MP	MP				
				Medium	Stainless	G Class	CBN	Standard	MM	RL		Standard	MM	RL		Standard	MM	RL		Standard	MM	RL					
Order Number	Stock	Insert Number		Dimensions (mm)				Shim	Shim Pre	Lock Pin	Lock Screw	Spring	Clamp Socket	Wrench													
DVPR/L2020K16	●	VN A	1604	20	20	125	32	20	25	DC5WZ	LLP13	DC3113	DC32	DC0207	TKY15F												
DVPR/L2525M16	●	VN G	1604	25	25	150	32	25	32	DC5WZ	LLP13	DC3113	DC32	DC0207	TKY15F												

\*1 Clamp Torque (N·m) : DC0207:1.5

		External turning, Copying		MP type				Finish				Light				Medium				Medium						
				FP	LP	MP	MP	FP	LP	MP	MP	FP	LP	MP	MP	FP	LP	MP	MP	FP	LP	MP	MP			
				Medium	Stainless	G Class	CBN	Standard	MM	RL		Standard	MM	RL		Standard	MM	RL		Standard	MM	RL				
Order Number	Stock	Insert Number		Dimensions (mm)				Shim	Lock Pin	Lock Screw	Stop Ring	Wrench														
PVNN2020K16	●	VN A	1604	20	20	125	38	20	10	PV322 (PV321)	P115	HSP05008C	E03	HKY25R												
PVNN2525M16	●	VN M	1604	25	25	150	38	25	12.5	PV323 (PV323)	P115	HSP05008C	E03	HKY25R												

\*1 Clamp Torque (N·m) : HSP05008C:2.5  
\*2 Please use shim no. PV321 and PV323 with RE0.4mm and RE1.2mm thick inserts. When using inserts, shim should be ordered separately.

		External turning, Copying		MP type				Finish				Light				Medium				Medium						
				FP	LP	MP	MP	FP	LP	MP	MP	FP	LP	MP	MP	FP	LP	MP	MP	FP	LP	MP	MP			
				Medium	Stainless	G Class	CBN	Standard	MM	RL		Standard	MM	RL		Standard	MM	RL		Standard	MM	RL				
Order Number	Stock	Insert Number		Dimensions (mm)				Shim	Lock Pin	Lock Screw	Stop Ring	Wrench														
PVPR/L2020K16	●	VN A	1604	20	20	125	32	20	25	PV322 (PV321)	P115	HSP05008C	E03	HKY25R												
PVPR/L2525M16	●	VN M	1604	25	25	150	32	25	32	PV323 (PV323)	P115	HSP05008C	E03	HKY25R												

\*1 Clamp Torque (N·m) : HSP05008C:2.5  
\*2 Please use shim no. PV321 and PV323 with RE0.4mm and RE1.2mm thick inserts. When using inserts, shim should be ordered separately.

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

● Inventory maintained.  
● Inventory maintained in Japan.

**LEGEND FOR STOCK STATUS MARK**  
Is shown on the left hand page of each double-page spread.

**REFERENCE PAGE FOR APPLICABLE INSERTS**  
Indicates reference pages giving details of inserts that are applicable to the product.

**PRODUCT STANDARDS**  
Indicates order numbers, stock status (per right/left hand), applicable inserts, dimensions, and spare parts.

**PAGE REFERENCE**  
· SPARE PARTS  
· TECHNICAL DATA  
Indicates reference pages, including the above, on the right hand page of each double-page spread.

# TURNING

# EXTERNAL TURNING TOOLS

CLASSIFICATION.....	C002
IDENTIFICATION .....	C006
METHOD OF HOLDING .....	C007
<b>STANDARD HOLDERS</b>	
CN○○INSERTS TOOL HOLDERS.....	C008
DN○○INSERTS TOOL HOLDERS.....	C010
SN○○INSERTS TOOL HOLDERS.....	C012
TN○○INSERTS TOOL HOLDERS.....	C016
VN○○INSERTS TOOL HOLDERS.....	C019
WN○○INSERTS TOOL HOLDERS.....	C022
CC○○INSERTS TOOL HOLDERS.....	C024
DC○○INSERTS TOOL HOLDERS.....	C025
RC○○INSERTS TOOL HOLDERS.....	C026
SC○○INSERTS TOOL HOLDERS.....	C028
TC○○INSERTS TOOL HOLDERS.....	C029
VC○○INSERTS TOOL HOLDERS.....	C030
XC○○INSERTS TOOL HOLDERS.....	C032
TL HOLDER .....	C037
<b>AL HOLDER</b>	
DE○○INSERTS TOOL HOLDERS .....	C034
TE○○INSERTS TOOL HOLDERS .....	C035
VD○○INSERTS TOOL HOLDERS .....	C036


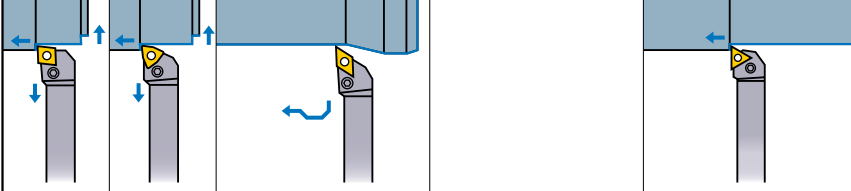

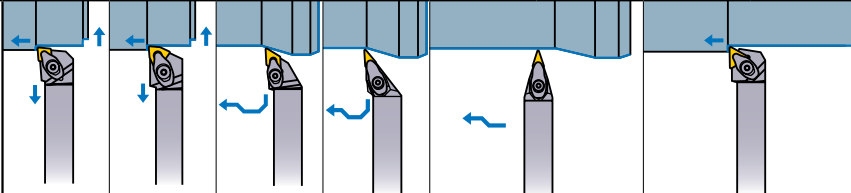

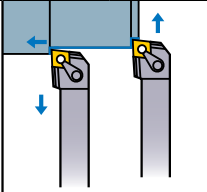

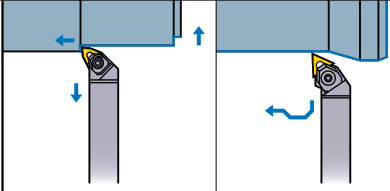

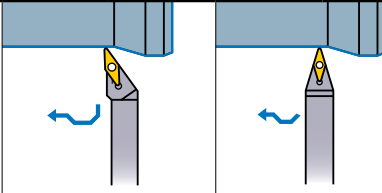


\*Alphabetical order index

C008 <b>DCLN</b>	C012 <b>PSBN</b>	C029 <b>STGC</b>
C010 <b>DDJN</b>	C014 <b>PSDN</b>	C035 <b>STGE</b>
C016 <b>DTGN</b>	C015 <b>PSKN</b>	C030 <b>SVJC</b>
C019 <b>DVJN</b>	C013 <b>PSSN</b>	C036 <b>SVJD</b>
C021 <b>DVPN</b>	C013 <b>PSTN</b>	C031 <b>SVPC</b>
C020 <b>DVVN</b>	C017 <b>PTFN</b>	C030 <b>SVVC</b>
C022 <b>DWLN</b>	C016 <b>PTGN</b>	C032 <b>SXZC</b>
C009 <b>MCLN</b>	C019 <b>PVJN</b>	C037 <b>TLHR</b>
C012 <b>MSBN</b>	C021 <b>PVPN</b>	
C014 <b>MSSN</b>	C020 <b>PVVN</b>	
C018 <b>MTEN</b>	C022 <b>PWLN</b>	
C017 <b>MTJN</b>	C024 <b>SCLC</b>	
C018 <b>MTQN</b>	C025 <b>SDJC</b>	
C023 <b>MWLN</b>	C034 <b>SDJE</b>	
C009 <b>PCBN</b>	C025 <b>SDNC</b>	
C008 <b>PCLN</b>	C034 <b>SDNE</b>	
C011 <b>PDHN</b>	C027 <b>SRDC</b>	
C010 <b>PDJN</b>	C027 <b>SRGC</b>	
C026 <b>PRDC</b>	C028 <b>SSSC</b>	
C026 <b>PRGC</b>	C035 <b>STFE</b>	

# CLASSIFICATION (Negative insert)

EXTERNAL TURNING TOOLS





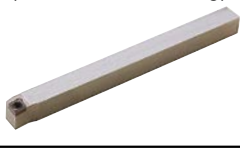

Tool Holder	Features Shank Size (H x W x L)	External Turning Facing		External Turning Copying		External Turning		
		KAPR=95°	KAPR=93°	KAPR=72.5°	KAPR=91°			
<b>LL Holder</b>  <ul style="list-style-type: none"> <li>● Lever lock type.</li> <li>● ISO standard.</li> <li>● Various holder shapes.</li> <li>● Suitable for light to heavy cutting.</li> <li>● Economical negative insert.</li> </ul> <p>10 x 10 x 70 25 x 25 x 150 12 x 12 x 80 32 x 25 x 170 16 x 16 x 100 32 x 32 x 170 20 x 20 x 125</p>		<b>PCLN</b> ↻ C008	<b>PWLN</b> ↻ C022	<b>PDJN</b> ↻ C010		<b>PTGN</b> ↻ C016		
<b>DOUBLE CLAMP Holder</b>  <ul style="list-style-type: none"> <li>● Double clamp type.</li> <li>● Holds inserts securely.</li> <li>● Excellent cutting edge tolerance.</li> <li>● Economical negative insert.</li> <li>● Small insert series.</li> </ul> <p>16 x 16 x 100 25 x 25 x 150 20 x 20 x 125 32 x 25 x 170</p>		<b>DCLN</b> ↻ C008	<b>DWLN</b> ↻ C022	<b>DDJN</b> ↻ C010	<b>DVJN</b> ↻ C019	<b>DVVN</b> ↻ C020	<b>DTGN</b> ↻ C016	
<b>DOUBLE CLAMP Holder</b> (For heavy cutting)  <ul style="list-style-type: none"> <li>● Double clamp holder type.</li> <li>● Holds inserts securely.</li> <li>● Suitable for heavy cutting.</li> <li>● Negative insert.</li> </ul> <p>32 x 32 x 170 40 x 40 x 200</p>		<b>MCLN</b> ↻ C009						
<b>WP Holder</b>  <ul style="list-style-type: none"> <li>● Double clamp holder type.</li> <li>● Simple insert exchange.</li> <li>● Economical negative insert.</li> </ul> <p>20 x 20 x 125 25 x 25 x 150 32 x 25 x 170</p>		<b>MWLN</b> ↻ C023	<b>MTJN</b> ↻ C017					
<b>MP Holder</b>  <ul style="list-style-type: none"> <li>● Pin lock type.</li> <li>● 35° rhombic shape insert.</li> <li>● Suitable for recessing.</li> </ul> <p>20 x 20 x 125 25 x 25 x 150</p>				<b>PVJN</b> ↻ C019	<b>PVJN</b> ↻ C019	<b>PVVN</b> ↻ C020		

	External Turning	External Turning, Chamfering		External Turning, Facing, Chamfering	Facing		Facing Copying	External Turning, Copying	Selection Standard				
	KAPR=75°	KAPR=60°	KAPR=45°	KAPR=45°	KAPR=75°	KAPR=91°	KAPR=105° 107.5° 117.5°	Special Design (Positive inserts)	Economical	Low Cutting Resistance (Sharpness)	Clamp Rigidity	Operation Efficiency	Specialised
	<b>PCBN</b> ↻ C009	<b>PSBN</b> ↻ C012	<b>SSTN</b> ↻ C013	<b>PSDN</b> ↻ C014	<b>PSSN</b> ↻ C013	<b>PSKN</b> ↻ C015	<b>PTFN</b> ↻ C017	<b>PDHN</b> ↻ C011	<b>PRGC</b> ↻ C026	<b>PRDC</b> ↻ C026			
							<b>DVPN</b> ↻ C021						
	<b>MSBN</b> ↻ C012			<b>MSSN</b> ↻ C014									
		<b>MTEN</b> ↻ C018					<b>MTQN</b> ↻ C018						
							<b>PVPN</b> ↻ C021						

Note 1) ◎ : 1st recommendation. ○ : 2nd recommendation.

# CLASSIFICATION (Positive insert)

EXTERNAL TURNING TOOLS

Tool Holder	Features Shank Size (H x W x L)	External Turning, Facing	External Turning, Copying	
		KAPR=95°	KAPR=93° 95°	KAPR=62.5° 72.5°
<b>Profile Holder</b> 	<ul style="list-style-type: none"> <li>● Double clamp holder type.</li> <li>● 25° rhombic shape insert.</li> <li>● Possible to machine a face relief with up to 60° inclination.</li> </ul> 16 x 16 x 100 20 x 20 x 125 25 x 25 x 150			
<b>SP Holder</b> 	<ul style="list-style-type: none"> <li>● Screw-on type.</li> <li>● Miniature holder with 7° positive insert.</li> </ul> 8 x 8 x 60 10 x 10 x 70 12 x 12 x 80 16 x 16 x 100 20 x 20 x 125 25 x 25 x 150			
<b>AL Holder</b> (For Aluminium) 	<ul style="list-style-type: none"> <li>● Screw-on type.</li> <li>● 20° positive insert. (35° rhombic shape insert is 15°)</li> <li>● High rake and good sharpness.</li> </ul> 16 x 16 x 100 20 x 20 x 125 25 x 25 x 150			
<b>TL Holder</b> 	<ul style="list-style-type: none"> <li>● Taper lock type</li> <li>● Excellent finished surface with round shape insert.</li> </ul> 20 x 20 x 125 25 x 25 x 150 32 x 25 x 170			
<b>SMALL TOOLS</b> (Tools for front turning) 	<ul style="list-style-type: none"> <li>● Screw-on type.</li> <li>● Tools to be equipped on gang type tool posts.</li> <li>● Miniature holder with 7° positive insert.</li> </ul> 8 x 8 x 125 10 x 10 x 125 12 x 12 x 150 16 x 16 x 150			
<b>SMALL TOOLS</b> (Tools for back turning) 	<ul style="list-style-type: none"> <li>● Screw-on type.</li> <li>● Tools to be equipped on gang type tool posts.</li> <li>● High rigidity due to designing of vertical insert. (BTA/CTB type)</li> <li>● Back machining. (BTA/CTB type)</li> </ul> 8 x 10 x 120 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120			



	External Turning	External Turning, Facing, Chamfering	Facing	Facing, Copying	External Turning, Copying	Selection Standard				
	KAPR=90° 91°	KAPR=45°	KAPR=91°	KAPR=117.5°	Special Design	Economical	Low Cutting Resistance (Sharpness)	Clamp Rigidity	Operation Efficiency	Specialised
							⊙	⊙		
					<b>SXZC</b> ⊕ C032					
							○			
	<b>STGC</b> ⊕ C029	<b>SSSC</b> ⊕ C028		<b>SVPC</b> ⊕ C031	<b>SRGC</b> ⊕ C027 <b>SRDC</b> ⊕ C027					
							⊙			⊙
	<b>STGE</b> ⊕ C035		<b>STFE</b> ⊕ C035							
							○			⊙
					<b>TLHR</b> ⊕ C037					
							○			
	<b>SCAC-SM</b> ⊕ D010			<b>SVPP-SM</b> ⊕ D013						
					Special Design 		○			
					<b>BTAH/CTBH</b> ⊕ D014, D015 <b>BTVH</b> ⊕ D016					

Note 1) ⊙ : 1st recommendation. ○ : 2nd recommendation.

# IDENTIFICATION

■ LL Holder / Double Clamp Holder /  
SP Holder / Profile Holder / AL Holder

**P** **C** **L** **N** **R** **25** **25** **M** **12**

①Clamp Structure

D	Double Clamp Type
M	Wedge Lock Type Multiple Clamp Type
P	Lever Lock Type
S	Screw-on Type

③Cutting Angle  
KAPR

A	90°Without Offset
B	75°
D	45°Neutral
E	60°
F	90°
G	90°With Offset
H	107.5°
J	93°
K	75°
L	95°
N	62.5°
P	117.5°
Q	105°
S	45°
T	60°
V	72.5°
Z	Special

④Insert Clearance

C	7°Positive
N	Negative
E	20°Positive

⑤Hand of Tool

R	Right Hand
L	Left Hand
N	Neutral

⑥Tool Size H/B (mm)  
(Height and Width)

8	08
10	10
12	12
16	16
20	20
25	25
32	32

⑦Tool Length  
LF (mm)

D	60
E	70
F	80
H	100
K	125
M	150
P	170
Q	180
R	200

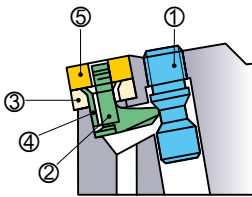
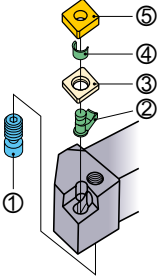
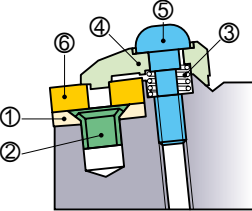
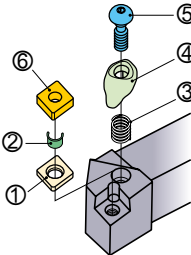
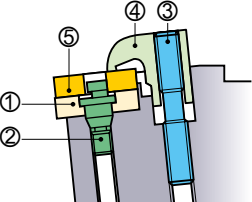
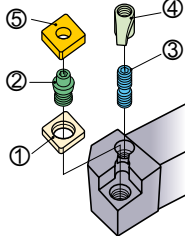
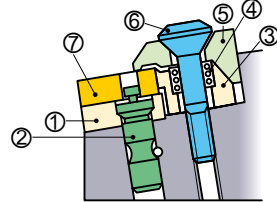
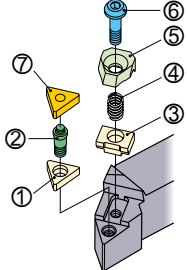
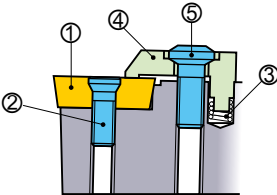
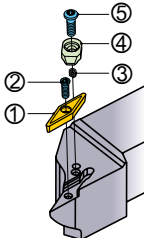
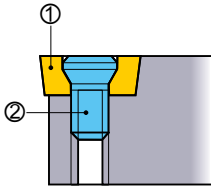
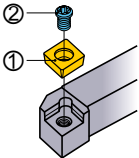
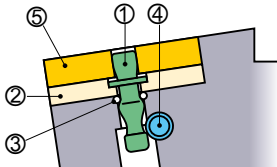
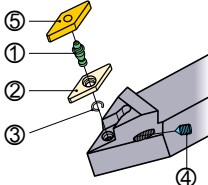
⑧Cutting Edge Length (mm)

Inscribed Circle	Insert Shape					
	Square	Triangular	Round	Rhombic 80°	Rhombic 55°	Rhombic 35°
6.00	-	-	06	-	-	-
6.35	-	11	-	06	07	11
7.94	-	13	-	-	-	-
8.00	-	-	08	-	-	-
9.525	09	16	-	09	11	16
10.00	-	-	10	-	-	-
12.00	-	-	12	-	-	-
12.70	12	22	-	12	15	-
15.875	15	27	-	16	-	-
16.00	-	-	16	-	-	-
19.05	19	-	-	19	-	-
20.00	-	-	20	-	-	-
25.00	-	-	25	-	-	-
25.40	25	-	-	-	-	-
32.00	-	-	32	-	-	-

②Insert Shape

C	Rhombic 80°
D	Rhombic 55°
R	Round
S	Square
T	Triangular
V	Rhombic 35°
W	Trigon
X	Special Design

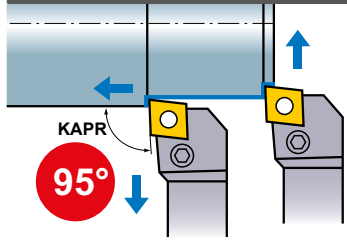
# METHOD OF HOLDING

Type (Holder)	Structure	
<b>Lever Lock (LL HOLDER)</b>		<ul style="list-style-type: none"> <li>① Clamp Screw</li> <li>② Lever</li> <li>③ Shim</li> <li>④ Shim Pin</li> <li>⑤ Insert</li> </ul> 
<b>Double Clamp (DOUBLE CLAMP) HOLDER</b>		<ul style="list-style-type: none"> <li>① Shim</li> <li>② Shim Pin</li> <li>③ Spring</li> <li>④ Clamp Bridge</li> <li>⑤ Clamp Screw</li> <li>⑥ Insert</li> </ul> 
<b>Multiple Clamp (DOUBLE CLAMP) HOLDER</b> (For heavy cutting)		<ul style="list-style-type: none"> <li>① Shim</li> <li>② Shim Pin</li> <li>③ Clamp Screw</li> <li>④ Clamp Bridge</li> <li>⑤ Insert</li> </ul> 
<b>Wedge Lock (WP HOLDER)</b>		<ul style="list-style-type: none"> <li>① Shim</li> <li>② Shim Pin</li> <li>③ Plate</li> <li>④ Spring</li> <li>⑤ Clamp Bridge</li> <li>⑥ Clamp Screw</li> <li>⑦ Insert</li> </ul> 
<b>Two Action Double Clamp (PROFILE HOLDER)</b>		<ul style="list-style-type: none"> <li>① Insert</li> <li>② Clamp Screw (1)</li> <li>③ Spring</li> <li>④ Clamp Bridge</li> <li>⑤ Clamp Screw (2)</li> </ul> 
<b>Screw-on (SP HOLDER) (AL HOLDER)</b>		<ul style="list-style-type: none"> <li>① Insert</li> <li>② Clamp Screw</li> </ul> 
<b>Pin Lock (MP HOLDER)</b>		<ul style="list-style-type: none"> <li>① Lock Pin</li> <li>② Shim</li> <li>③ Stop Ring</li> <li>④ Lock Screw</li> <li>⑤ Insert</li> </ul> 

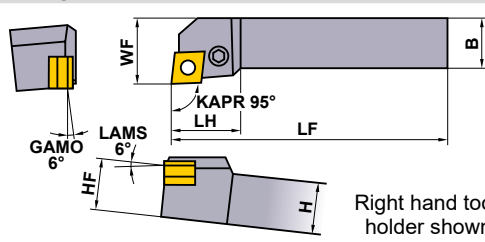
# EXTERNAL TURNING TOOLS

## CN INSERTS TOOL HOLDERS

### PCLN



External turning, Facing **LL type**

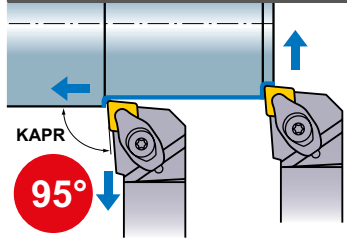


Finish	Light	Medium	Medium
FP	LP	MP	MK
(12)	(12)	(12,16,19)	(12,16,19)
Medium	Medium to Rough	Stainless	CBN
Standard	RP	MM	
(09,12,16,19)	(12,16,19)	(12,16,19)	(12)

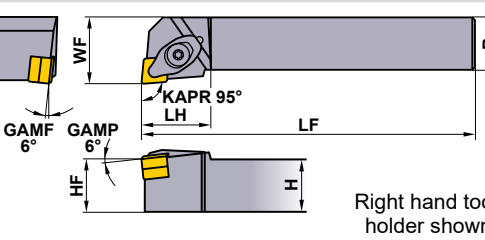
Order Number	Stock		Insert Number	Dimensions (mm)							Shim	Shim Pin	Clamp Lever	Clamp Screw*	Wrench
	R	L		H	B	LF	LH	HF	WF						
PCLNR/L1616H09	●	●	CNMG	09T3	16	16	100	22	16	20	LLSCN3T3	LLP13	LLCL13	LLCS106	HKY25R
PCLNR/L2020K09	●	●		09T3	20	20	125	22	20	25	LLSCN3T3	LLP13	LLCL13	LLCS106	HKY25R
PCLNR/L2525M09	●	●		09T3	25	25	150	22	25	32	LLSCN3T3	LLP13	LLCL13	LLCS106	HKY25R
PCLNR/L2020K12	●	●	CNMA CNMG CNMM CNGA CNGG CNGM	1204	20	20	125	28	20	25	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R
PCLNR/L2525M12	●	●		1204	25	25	150	28	25	32	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R
PCLNR/L3225P12	●	●		1204	32	25	170	28	32	32	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R
PCLNR/L3232P16	●	●		1606	32	32	170	32	32	40	LLSCN53	LLP15	LLCL25	LLCS508	HKY30R
PCLNR/L3232P19	●	●		1906	32	32	170	40	32	40	LLSCN63	LLP16	LLCL16	LLCS310	HKY40R

\* Clamp Torque (N · m) : LLCS106=2.2, LLCS108=3.3, LLCS508=3.3, LLCS310=7.0

### DCLN



External turning, Facing **DOUBLE CLAMP type**



Finish	Light	Medium	Medium
FP	LP	MP	MK
(12)	(12)	(12)	(12)
Medium	Medium to Rough	Stainless	CBN
Standard	RP	MM	
(09,12)	(12)	(12)	(12)

Order Number	Stock		Insert Number	Dimensions (mm)							Shim*2	Shim Pin	Clamp Bridge	Spring	Clamp Screw*1	Wrench
	R	L		H	B	LF	LH	HF	WF							
DCLNR/L1616H09	●	●	CNMG	09T3	16	16	100	25	16	20	LLSCN3T3 (LLSCN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DCLNR/L1616H09-T	●	●		0903	16	16	100	25	16	20	LLSCN33	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DCLNR/L2020K09	●	●		09T3	20	20	125	25	20	25	LLSCN3T3 (LLSCN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DCLNR/L2020K09-T	●	●		0903	20	20	125	25	20	25	LLSCN33	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DCLNR/L2525M09	●	●		09T3	25	25	150	25	25	32	LLSCN3T3 (LLSCN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DCLNR/L2525M09-T	●	●		0903	25	25	150	25	25	32	LLSCN33	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DCLNR/L2020K12	●	●	CNMA CNMG CNMM CNGA CNGG CNGM	1204	20	20	125	29	20	25	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DCLNR/L2525M12	●	●		1204	25	25	150	29	25	32	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DCLNR/L3225P12	●	●		1204	32	25	170	29	32	32	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

\*1 Clamp Torque (N · m) : DC0520T=3.5, DC0621T=5.0

\*2 Please use shim no. LLSCN33 with 3.18mm thick inserts. When using 3.18mm thick inserts, the shim should be ordered separately.

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

● : Inventory maintained.

PCLN type inserts > A098—A104  
DCLN type inserts > A098—A104

PCBN & PCD inserts > B036—B038, B064  
RECOMMENDED CUTTING CONDITIONS > A074, B020

Order Number		Stock	Insert Number		Dimensions (mm)							Accessories				
					H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw*	Wrench	
<b>MCLNR3232P19</b>	●		CNMG	1906	32	32	170	36	32	40	MSCN63	MP6	CKW6	LS25	HKY40R	
<b>MCLNR4040R19</b>	●		CNMM CNMA	1906	40	40	200	36	40	50	MSCN63	MP6	CKW6	LS25	HKY40R	

\* Clamp Torque (N · m) : LS25=8.2

Order Number		Stock	Insert Number		Dimensions (mm)							Accessories				
					H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Lever	Clamp Screw*	Wrench	
<b>PCBNR/L2020K12</b>	●●		CNMA CNGG	1204	20	20	125	28	20	17	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R	
<b>PCBNR/L2525M12</b>	●●		CNMA CNOM	1204	25	25	150	25	25	22	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R	

\* Clamp Torque (N · m) : LLCS108=3.3

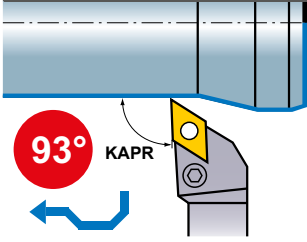
MCLN type inserts	> A100 – A104
PCBN type inserts	> A098 – A104
PCBN & PCD inserts	> B036 – B038, B064

RECOMMENDED CUTTING CONDITIONS	> A074, B020
SPARE PARTS	> N001
TECHNICAL DATA	> P001

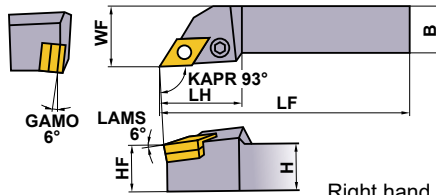
# EXTERNAL TURNING TOOLS

## DN INSERTS TOOL HOLDERS









### PDJN



External turning, Copying **LL type**



Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
 (15)	 (15)	 (15)	 (15)
Medium to Rough	Stainless	G Class	CBN
RP	MM	R/L	
 (15)	 (15)	 (15)	 (15)

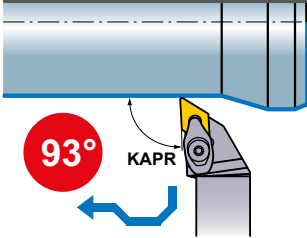
Order Number	Stock		Insert Number	Dimensions (mm)							Accessories				
	R	L		H	B	LF	LH	HF	WF	*2 Shim	Shim Pin	Clamp Lever	*1 Clamp Screw	Wrench	
PDJNR/L2020K15	●	●	DNMA DNMG DNMM DNMX DNGA DNGG DNMG	1504	20	20	125	35	20	25	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HKY30R
PDJNR/L2525M15	●	●		1504	25	25	150	35	25	32	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HKY30R
PDJNR/L3225P15	●	●		1504	32	25	170	35	32	32	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HKY30R

\*1 Clamp Torque (N · m) : LLCS108=3.3

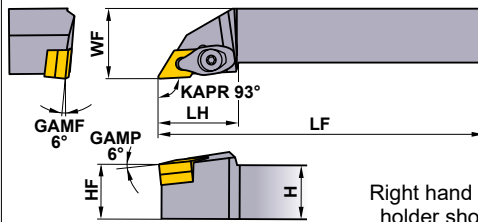
\*2 Please use shim no. LLSDN42 with 6.35mm thick inserts. When using 6.35mm thick inserts, the shim should be ordered separately.

EXTERNAL TURNING TOOLS









### DDJN



External turning, Copying **DOUBLE CLAMP type**



Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
 (15)	 (11,15)	 (15)	 (11,15)
Medium to Rough	Stainless	G Class	CBN
RP	MM	R/L	
 (15)	 (15)	 (15)	 (15)

Order Number	Stock		Insert Number	Dimensions (mm)							Accessories					
	R	L		H	B	LF	LH	HF	WF	*2 Shim	Shim Pin	Clamp Bridge	Spring	*1 Clamp Screw	Wrench	
DDJNR/L1616H11	●	●	DNGA	1104	16	16	100	28	16	20	LLSDN32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DDJNR/L2020K11	●	●		1104	20	20	125	28	20	25	LLSDN32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DDJNR/L2525M11	●	●		1104	25	25	150	28	25	32	LLSDN32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DDJNR/L3225P11	●	●		1104	32	25	170	28	32	32	LLSDN32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DDJNR/L2020K15	●	●	DNMA DNMG DNMM DNMX DNGA DNGG DNMG	1504	20	20	125	37	20	25	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F
DDJNR/L2020K15-T	●	●		1506	20	20	125	37	20	25	LLSDN42	LLP24	DCK2613	DCS1	DC0621T	TKY20F
DDJNR/L2525M15	●	●		1504	25	25	150	37	25	32	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F
DDJNR/L2525M15-T	●	●		1506	25	25	150	37	25	32	LLSDN42	LLP24	DCK2613	DCS1	DC0621T	TKY20F
DDJNR/L3225P15	●	●		1504	32	25	170	37	32	32	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F
DDJNR/L3225P15-T	●	●		1506	32	25	170	37	32	32	LLSDN42	LLP24	DCK2613	DCS1	DC0621T	TKY20F

\*1 Clamp Torque (N · m) : DC0520T=3.5, DC0621T=5.0

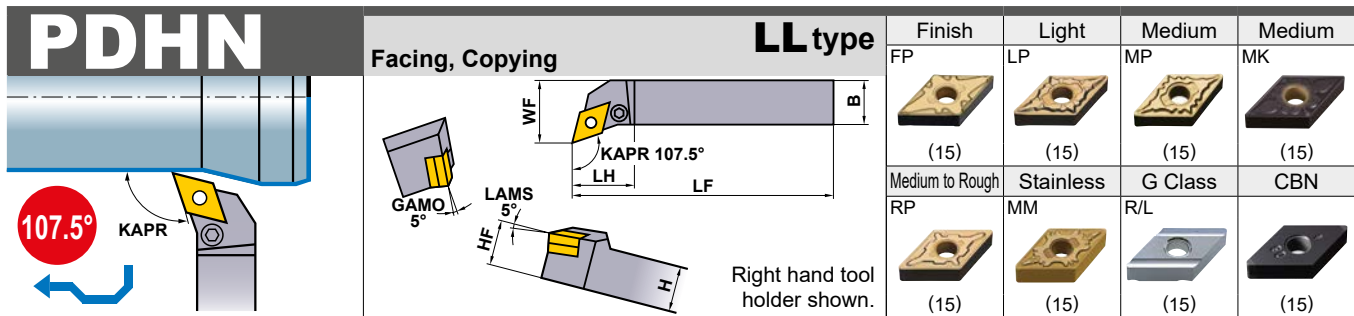
\*2 Please use shim no. LLSDN42 with 6.35mm thick inserts. When using 6.35mm thick inserts, the shim should be ordered separately.

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

● : Inventory maintained.

PDJN type inserts > A105–A111  
DDJN type inserts > A105–A111

PCBN & PCD inserts > B039–B042, B064  
RECOMMENDED CUTTING CONDITIONS > A074, B020



Order Number	Stock		Insert Number	Dimensions (mm)							Accessories				
	R	L		H	B	LF	LH	HF	WF	*2 Shim	Shim Pin	Clamp Lever	*1 Clamp Screw	Wrench	
PDHNR/L2020K15	●	●	DNMA DNMG DNMM	1504	20	20	125	34	20	25	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HKY30R
PDHNR/L2525M15	●	●	DNGA DNMG DNGG	1504	25	25	150	34	25	32	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HKY30R
PDHNR/L3225P15	●	●	DNGM	1504	32	25	170	34	32	32	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HKY30R

\*1 Clamp Torque (N • m) : LLCS108=3.3

\*2 Please use shim no. LLSDN42 with 6.35mm thick inserts. When using 6.35mm thick inserts, the shim should be ordered separately.

EXTERNAL TURNING TOOLS

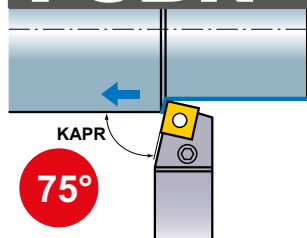
PDHN type inserts	> A105–A111
PCBN & PCD inserts	> B039–B042, B064
RECOMMENDED CUTTING CONDITIONS	> A074, B020

SPARE PARTS	> N001
TECHNICAL DATA	> P001

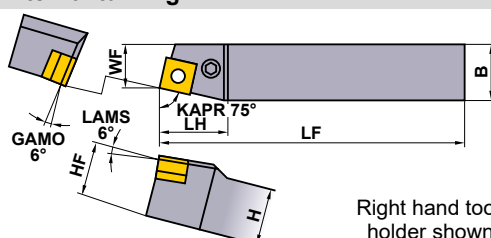
# EXTERNAL TURNING TOOLS

## SN INSERTS TOOL HOLDERS

### PSBN



### External turning LL type



Finish	Light	Medium	Medium
FP  (12)	LP  (12)	MP  (12)	MK  (12,15,19)
Medium to Rough RP  (12,15,19)	Stainless MM  (12,15,19)	G Class R/L  (09,12)	CBN  (12)

Right hand tool holder shown.

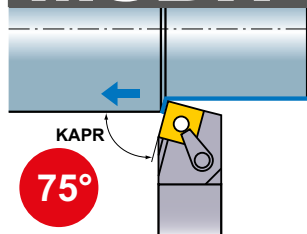
Order Number	Stock		Insert Number	Dimensions (mm)						Accessories						
	R	L		H	B	LF	LH	HF	WF	Shim	Shim Pin	Lever Spring	Clamp Lever	Clamp Screw*	Wrench	
PSBNR/L1212F09	●		SNMA SNMG SNMM SNGA SNGG	0903	12	12	80	20	12	13	—	—	HLS2	LLCL13S	LLCS105	HKY20R
PSBNR/L1616H09	●	●		0903	16	16	100	22	16	13	LLSSN33	LLP23	—	LLCL13	LLCS106	HKY25R
PSBNR/L2020K12	●	●		1204	20	20	125	28	20	17	LLSSN42	LLP14	—	LLCL14	LLCS108	HKY30R
PSBNR/L2525M12	●	●		1204	25	25	150	25	25	22	LLSSN42	LLP14	—	LLCL14	LLCS108	HKY30R
PSBNR/L2525M15	●	●		1506	25	25	150	33	25	22	LLSSN53	LLP15	—	LLCL25	LLCS508	HKY30R
PSBNR/L3232P19	●	●		1906	32	32	170	40	32	27	LLSSN63	LLP16	—	LLCL16	LLCS310	HKY40R

\* Clamp Torque (N · m) : LLCS105=1.5, LLCS106=2.2, LLCS108=3.3, LLCS508=3.3, LLCS310=7.0

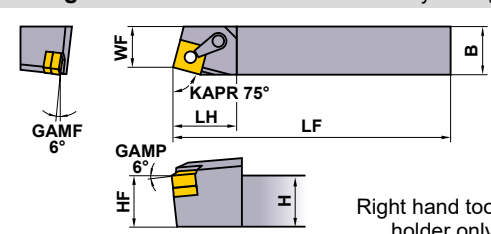
EXTERNAL TURNING TOOLS

C

### MSBN



### External turning DOUBLE CLAMP type For heavy cutting



Medium	Medium	Medium	Medium to Rough
MH  (19)	Standard  (19)	MS  (19)	RP  (19)
Heavy HZ  (19)	Heavy HX  (19)	Heavy HL  (19)	M Class Flat Top  (19)

Right hand tool holder only.

Order Number	Stock		Insert Number	Dimensions (mm)						Accessories					
	R			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw*	Wrench	
MSBNR3232P19	●		SNMG SNMM SNMA	1906	32	32	170	41	32	27	MSSN63	MP6	CKW6	LS25	HKY40R
MSBNR4040R19	●			1906	40	40	200	41	40	35	MSSN63	MP6	CKW6	LS25	HKY40R

\* Clamp Torque (N · m) : LS25=8.2

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.



Order Number		Stock		Insert Number		Dimensions (mm)						Accessories				
		R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Lever	Clamp Screw*	Wrench
<b>PSTNR/L1616H09</b>	● ●	● ●	● ●	SNMA SNMG SNMM SNGA SNGG	0903	16	16	100	20	16	13	LLSSN33	LLP23	LLCL13	LLCS106	HKY25R
<b>PSTNR/L2020K12</b>	● ●	● ★	● ●		1204	20	20	125	25	20	17	LLSSN42	LLP14	LLCL14	LLCS108	HKY30R
<b>PSTNR/L2525M12</b>	● ●	● ●	● ●		1204	25	25	150	25	25	22	LLSSN42	LLP14	LLCL14	LLCS108	HKY30R

\* Clamp Torque (N · m) : LLCS106=2.2, LLCS108=3.3

Order Number		Stock		Insert Number		Dimensions (mm)							Accessories				
		R	L			H	B	LF	LH	HF	WF	WF2	Shim	Shim Pin	Clamp Lever	Clamp Screw*	Wrench
<b>PSSNR/L1616H09</b>	● ●	● ●	● ●	SNMA SNMG SNMM SNGA SNGG	0903	16	16	100	22	16	20	(14)	LLSSN33	LLP23	LLCL13	LLCS106	HKY25R
<b>PSSNR/L2020K12</b>	● ●	● ●	● ●		1204	20	20	125	31	20	25	(17)	LLSSN42	LLP14	LLCL14	LLCS108	HKY30R
<b>PSSNR/L2525M12</b>	● ●	● ●	● ●		1204	25	25	150	31	25	32	(24)	LLSSN42	LLP14	LLCL14	LLCS108	HKY30R
<b>PSSNR/L3232P15</b>	● ●	● ●	● ●		1506	32	32	170	34	32	40	(29)	LLSSN53	LLP15	LLCL25	LLCS508	HKY30R
<b>PSSNR/L3232P19</b>	● ●	● ●	● ●		1906	32	32	170	40	32	40	(27)	LLSSN63	LLP16	LLCL16	LLCS310	HKY40R

Note 1) When facing or chamfering only and using insert with right or left hand breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

\* Clamp Torque (N · m) : LLCS106=2.2, LLCS108=3.3, LLCS508=3.3, LLCS310=7.0

PSTN type inserts	> A113–A118
PSSN type inserts	> A113–A118
PCBN & PCD inserts	> B043, B065

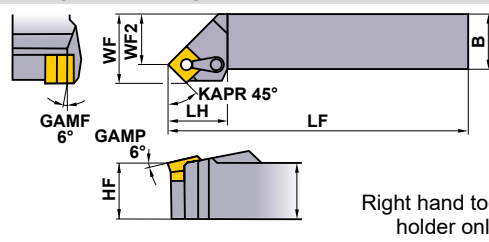
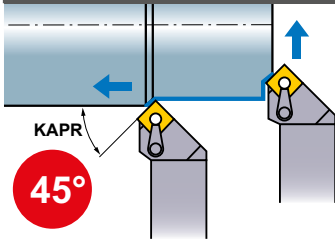
RECOMMENDED CUTTING CONDITIONS	> A074, B020
SPARE PARTS	> N001
TECHNICAL DATA	> P001

# EXTERNAL TURNING TOOLS

## SN INSERTS TOOL HOLDERS

### MSSN

External turning, Facing, Chamfering **DOUBLE CLAMP type** For heavy cutting



Medium MH (19)	Medium Standard (19)	Medium MS (19)	Rough RP (19)
Heavy HZ (19)	Heavy HX (19)	Heavy HL (19)	M Class Flat Top (19)

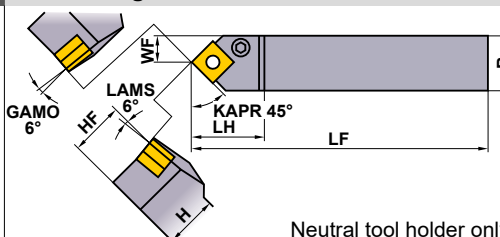
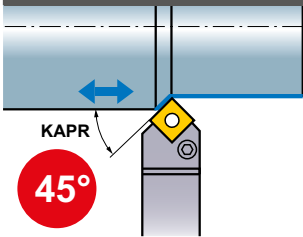
Order Number	Stock R	Insert Number	Dimensions (mm)							Tools					
			H	B	LF	LH	HF	WF	WF2	Shim	Shim Pin	Clamp Bridge	Clamp Screw*	Wrench	
MSSNR3232P19	●	SNMG SNMM SNMA	1906	32	32	170	44	32	40	27	MSSN63	MP6	CKW6	LS25	HKY40R
MSSNR4040R19	●	SNMG SNMM SNMA	1906	40	40	200	44	40	50	37	MSSN63	MP6	CKW6	LS25	HKY40R

\* Clamp Torque (N · m) : LS25=8.2

EXTERNAL TURNING TOOLS

### PSDN

External turning, Chamfering **LL type**



Finish FP (12)	Light LP (12)	Medium MP (12)	Medium MK (12)
Medium to Rough RP (12)	Stainless MM (12)	G Class R/L (09,12)	CBN (12)

Order Number	Stock	Insert Number	Dimensions (mm)							Tools					
			H	B	LF	LH	HF	WF	Shim	Shim Pin	Lever Spring	Clamp Lever	Clamp Screw*	Wrench	
PSDNN1212F09	●	SNMA SNMG SNMM SNGA SNGG	0903	12	12	80	20	12	6.0	—	—	HLS2	LLCL13S	LLCS105	HKY20R
PSDNN1616H09	●	SNMA SNMG SNMM SNGA SNGG	0903	16	16	100	22	16	8.0	LLSSN33	LLP23	—	LLCL13	LLCS106	HKY25R
PSDNN2020K12	●	SNMA SNMG SNMM SNGA SNGG	1204	20	20	125	28	20	10.0	LLSSN42	LLP14	—	LLCL14	LLCS108	HKY30R
PSDNN2525M12	●	SNMA SNMG SNMM SNGA SNGG	1204	25	25	150	28	25	12.5	LLSSN42	LLP14	—	LLCL14	LLCS108	HKY30R
PSDNN3225P12	●	SNMA SNMG SNMM SNGA SNGG	1204	32	25	170	28	32	12.5	LLSSN42	LLP14	—	LLCL14	LLCS108	HKY30R

\* Clamp Torque (N · m) : LLCS105=1.5, LLCS106=2.2, LLCS108=3.3

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

● : Inventory maintained.

MSSN type inserts > A114–A118  
PSDN type inserts > A113–A118

PCBN & PCD inserts > B043, B065  
RECOMMENDED CUTTING CONDITIONS > A074, B020

PSKN		Facing								LL type					
		Stock		Insert Number		Dimensions (mm)				Shim	Shim Pin	Clamp Lever	Clamp Screw*	Wrench	
R	L	H	B	LF	LH	HF	WF	FP	LP	MP	MK	RP	MM	R/L	
●	●	16	16	100	20	16	20	(12)	(12)	(12)	(12)	(12)	(12)	(09,12)	(12)
●	●	20	20	125	25	20	25	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
●	●	25	25	150	25	25	32	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)

Note 1) When using inserts with right or left hand chipbreakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

\* Clamp Torque (N · m) : LLCS106=2.2, LLCS108=3.3

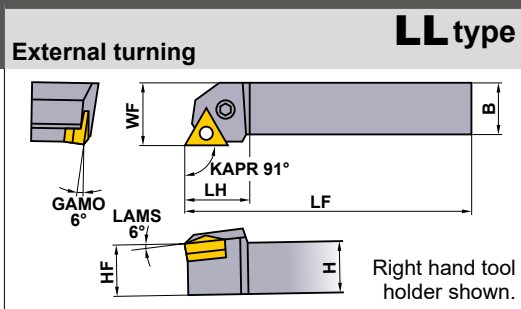
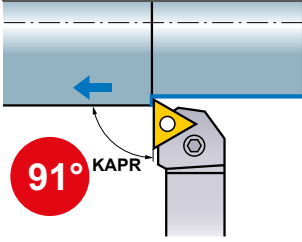
PSKN type inserts > A113–A118  
 PCBN & PCD inserts > B043, B065  
 RECOMMENDED CUTTING CONDITIONS > A074, B020

SPARE PARTS > N001  
 TECHNICAL DATA > P001

# EXTERNAL TURNING TOOLS

## TN INSERTS TOOL HOLDERS

### PTGN

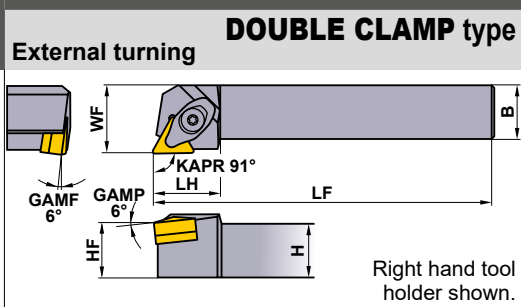
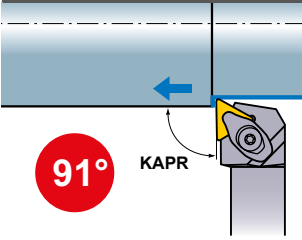


Finish	Light	Medium	Medium
FP  (16)	LP  (16,22)	MP  (16,22)	MK  (16,22)
Medium to Rough RP  (16,22,27)	Stainless MM  (16,22)	G Class R/L  (11,16,22)	CBN  (16)

Order Number	Stock		Insert Number	Dimensions (mm)							*2		*2		*1	
	R	L		H	B	LF	LH	HF	WF	Shim	Shim Pin	Lever Spring	Clamp Lever	Clamp Screw	Wrench	
PTGNR/L1010E11	●	●	TNMA TNMG TNMM TNGA TNGG TNGM	1103	10	10	70	17	10	12	—	—	HLS1	LLCL12S	LLCS105	HKY20F
PTGNR/L1212F11	●	●		1103	12	12	80	17	12	16	—	—	HLS1	LLCL12S	LLCS105	HKY20F
PTGNR/L1616H16	●	●		1604	16	16	100	22	16	20	LLSTN32 (LLSTN33)	LLP13 (LLP23)	—	LLCL13	LLCS106	HKY25R
PTGNR/L2020K16	●	●		1604	20	20	125	22	20	25	LLSTN32 (LLSTN33)	LLP13 (LLP23)	—	LLCL13	LLCS106	HKY25R
PTGNR/L2525M16	●	●		1604	25	25	150	22	25	32	LLSTN32 (LLSTN33)	LLP13 (LLP23)	—	LLCL13	LLCS206	HKY25R
PTGNR/L2525M22	●	●		2204	25	25	150	28	25	32	LLSTN42	LLP14	—	LLCL14	LLCS108	HKY30R
PTGNR/L3225P22	●	●		2204	32	25	170	28	32	32	LLSTN42	LLP14	—	LLCL14	LLCS108	HKY30R
PTGNR/L3232P27	●	●		2706	32	32	170	35	32	40	LLSTN53	LLP15	—	LLCL25	LLCS508	HKY30R

\*1 Clamp Torque (N · m) : LLCS105=1.5, LLCS106=2.2, LLCS206=2.2, LLCS108=3.3, LLCS508=3.3  
 PTGNR/L1010E11 · PTGNR/L1212F11 Clamp Torque (N · m) : LLCS105=1.0  
 \*2 Please use shim no. LLSTN33 and shim pin no. LLP23 with 3.18mm thick inserts. When using 3.18mm thick inserts, the shim and shim pin should be ordered separately.

### DTGN



Finish	Light	Medium	Medium
FP  (16)	LP  (16)	MP  (16)	MK  (16)
Medium to Rough RP  (16)	Stainless MM  (16)	G Class R/L  (16)	CBN  (16)

Order Number	Stock		Insert Number	Dimensions (mm)							*2		*2		*1	
	R	L		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench	
DTGNR/L1616H16	●	●	TNMA TNMG TNMM TNGA TNGG TNGM	1604	16	16	100	25	16	20	LLSTN32 (LLSTN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DTGNR/L1616H16-T	●	●		1603	16	16	100	25	16	20	LLSTN33	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DTGNR/L2020K16	●	●		1604	20	20	125	25	20	25	LLSTN32 (LLSTN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DTGNR/L2020K16-T	●	●		1603	20	20	125	25	20	25	LLSTN33	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DTGNR/L2525M16	●	●		1604	25	25	150	25	25	32	LLSTN32 (LLSTN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DTGNR/L2525M16-T	●	●		1603	25	25	150	25	25	32	LLSTN33	LLP23	DCK2211	DCS2	DC0520T	TKY15F

\*1 Clamp Torque (N · m) : DC0520T=3.5  
 \*2 Please use shim no. LLSTN33 with 3.18mm thick inserts. When using 3.18mm thick inserts, the shim should be ordered separately.

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

● : Inventory maintained.

PTGN type inserts > A119-A125  
 DTGN type inserts > A119-A125

PCBN & PCD inserts > B044, B045, B065  
 RECOMMENDED CUTTING CONDITIONS > A074, B020

Order Number		Stock		Insert Number		Dimensions (mm)					*2		*1		
		R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Lever	Clamp Screw
<b>PTFNR/L1616H16</b>	●●	●●	TNMA	1604	16	16	100	22	16	20	LLSTN32 (LLSTN33)	LLP13 (LLP23)	LLCL13	LLCS106	HKY25R
<b>PTFNR/L2020K16</b>	●●	●●	TNMG	1604	20	20	125	22	20	25	LLSTN32 (LLSTN33)	LLP13 (LLP23)	LLCL13	LLCS106	HKY25R
<b>PTFNR/L2525M16</b>	●●	●●	TNMM	1604	25	25	150	22	25	32	LLSTN32 (LLSTN33)	LLP13 (LLP23)	LLCL13	LLCS206	HKY25R
<b>PTFNR/L2525M22</b>	●●	●●	TNGA TNGG TNGM	2204	25	25	150	28	25	32	LLSTN42	LLP14	LLCL14	LLCS108	HKY30R

Note 1) When using inserts with right or left hand chipbreakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

\*1 Clamp Torque (N · m) : LLCS106=2.2, LLCS206=2.2, LLCS108=3.3

\*2 Please use shim no. LLSTN33 and shim pin no. LLP23 with 3.18mm thick inserts. When using 3.18mm thick inserts, the shim should be ordered separately.

Order Number		Stock		Insert Number		Dimensions (mm)					*2		*1				
		R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Side Lock Plate	Spring	Clamp Screw
<b>MTJNR/L2020K16N</b>	●●	●●	TN $\circ$ A	1604	20	20	125	31	20	25	WPSTN33	CCP33	CCK13	CPT13	MES2	SLCS105	HKY25R HKY40R
<b>MTJNR/L2525M16N</b>	●●	●●	TN $\circ$ G	1604	25	25	150	31	25	32	WPSTN33	CCP33	CCK13	CPT13	MES2	SLCS105	HKY25R HKY40R
<b>MTJNR/L2525M22N</b>	●●	●●	TN $\circ$ M TNMX	2204	25	25	150	38	25	32	WPSTN43	CCP34	CCK14	CPT14	MES3	SLCS106	HKY30R HKY40R

\*1 Clamp Torque (N · m) : SLCS105=7.0, SLCS106=7.0

\*2 HKY25R, HKY30R Wrench for Shim Pin, HKY40R Wrench for Clamp Screw.

PTFN type inserts	> A119 – A125
MTJN type inserts	> A119 – A125
PCBN & PCD inserts	> B044, B045, B065

RECOMMENDED CUTTING CONDITIONS	> A074, B020
SPARE PARTS	> N001
TECHNICAL DATA	> P001

# EXTERNAL TURNING TOOLS

## TN INSERTS TOOL HOLDERS

EXTERNAL TURNING TOOLS

Order Number		Stock	Insert Number	Dimensions (mm)							WP type							
				H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Side Lock Plate	Spring	Clamp Screw	Wrench		
<b>MTENN2020K16N</b>		●	TN: A TN: G	1604	20	20	125	34	20	10	WPSTN33	CCP33	CCK13	CPT13	MES2	SLCS105	HKY25R HKY40R	
<b>MTENN2525M22N</b>		●	TN: M TNMX	2204	25	25	150	44	25	12.5	WPSTN43	CCP34	CCK14	CPT14	MES3	SLCS106	HKY30R HKY40R	

\*1 Clamp Torque (N • m) : SLCS105=7.0, SLCS106=7.0  
 \*2 HKY25R, HKY30R Wrench for Shim Pin, HKY40R Wrench for Clamp Screw.

Order Number		Stock	Insert Number	Dimensions (mm)							WP type							
				H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Side Lock Plate	Spring	Clamp Screw	Wrench		
<b>MTQNR/L2020K16N</b>		● ●	TN: A TN: G	1604	20	20	125	31	20	25	WPSTN33	CCP33	CCK13	CPT13	MES2	SLCS105	HKY25R HKY40R	
<b>MTQNR/L2525M22N</b>		● ●	TN: M TNMX	2204	25	25	150	36	25	32	WPSTN43	CCP34	CCK14	CPT14	MES3	SLCS106	HKY30R HKY40R	

Note 1) When facing only and using inserts with right or left hand chipbreakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

\*1 Clamp Torque (N • m) : SLCS105=7.0, SLCS106=7.0  
 \*2 HKY25R, HKY30R Wrench for Shim Pin, HKY40R Wrench for Clamp Screw.

Note 2) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

PVJN		External turning, Copying		MP type		Finish									
						Light	Medium	Medium	Medium						
				FP	LP	MP	MP	MP	MP						
				(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)				
				Right hand tool holder shown.		Medium	Stainless	G Class	CBN						
						Standard	MM	R/L							
						(16)	(16)	(16)	(16)						
Order Number	Stock		Insert Number	Dimensions (mm)											
	R	L		H	B	LF	LH	HF	WF	*2 Shim	Lock Pin	*1 Lock Screw	Stop Ring	Wrench	
PVJNR/L2020K16	●	●	VN <sup>o</sup> A VN <sup>o</sup> G VN <sup>o</sup> M	1604	20	20	125	32	20	25	PV322 (PV321) (PV323)	P11S	HSP05008C	E03	HKY25R
PVJNR/L2525M16	●	●	VN <sup>o</sup> A VN <sup>o</sup> G VN <sup>o</sup> M	1604	25	25	150	38	25	32		P11S	HSP05008C	E03	HKY25R

\*1 Clamp Torque (N · m) : HSP05008C=2.5

\*2 Please use shim no. PV321 and PV323 with RE0.4mm and RE1.2mm thick inserts. When using inserts, shim should be ordered separately.

DVJN		External turning, Copying		DOUBLE CLAMP type		Finish										
						Light	Medium	Medium	Medium							
				FP	LP	MP	MP	MP	MP							
				(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)					
				Right hand tool holder shown.		Medium	Stainless	G Class	CBN							
						Standard	MM	R/L								
						(16)	(16)	(16)	(16)							
Order Number	Stock		Insert Number	Dimensions (mm)												
	R	L		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench	
DVJNR/L2020K16	●	●	VN <sup>o</sup> A VN <sup>o</sup> G VN <sup>o</sup> M	1604	20	20	125	41	20	25	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
DVJNR/L2525M16	●	●	VN <sup>o</sup> A VN <sup>o</sup> G VN <sup>o</sup> M	1604	25	25	150	41	25	32	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F

\* Clamp Torque (N · m) : DC0520T=3.5

PVJN type inserts > A126 – A129  
 DVJN type inserts > A126 – A129  
 PCBN & PCD inserts > B046, B047, B066

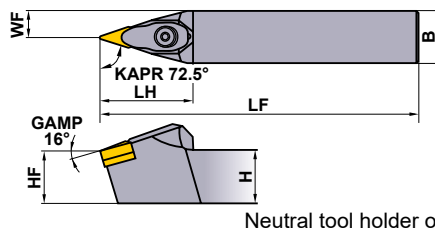
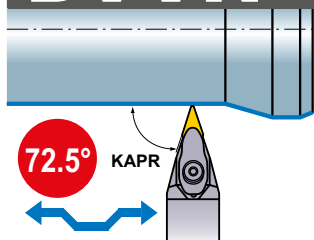
RECOMMENDED CUTTING CONDITIONS > A074, B020  
 SPARE PARTS > N001  
 TECHNICAL DATA > P001

# EXTERNAL TURNING TOOLS









## VN<sup>○</sup> INSERTS TOOL HOLDERS

### DVVN

External turning, **DOUBLE CLAMP** type  
Copying



Neutral tool holder only.

Finish	Light	Medium	Medium
FP  (16)	LP  (16)	MP  (16)	MK  (16)
Medium	Stainless	G Class	CBN
Standard  (16)	MM  (16)	R/L  (16)	 (16)

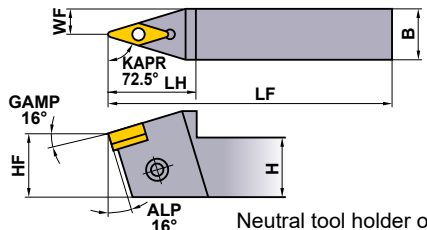
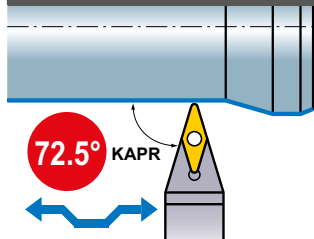
Order Number	Stock	Insert Number	Dimensions (mm)						Accessories						
			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench	
DVVNN2020K16	●	VN <sup>○</sup> A VN <sup>○</sup> G VN <sup>○</sup> M	1604	20	20	125	44	20	10	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
DVVNN2525M16	●	VN <sup>○</sup> A VN <sup>○</sup> G VN <sup>○</sup> M	1604	25	25	150	44	25	12.5	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F

\* Clamp Torque (N · m) : DC0520T=3.5









EXTERNAL TURNING TOOLS

### PVVN

External turning, **MP** type  
Copying



Neutral tool holder only.

Finish	Light	Medium	Medium
FP  (16)	LP  (16)	MP  (16)	MK  (16)
Medium	Stainless	G Class	CBN
Standard  (16)	MM  (16)	R/L  (16)	 (16)

Order Number	Stock	Insert Number	Dimensions (mm)						Accessories					
			H	B	LF	LH	HF	WF	Shim *2	Lock Pin	Lock Screw *1	Stop Ring	Wrench	
PVVNN2020K16	●	VN <sup>○</sup> A VN <sup>○</sup> G VN <sup>○</sup> M	1604	20	20	125	38	20	10	PV322 (PV321) (PV323)	P11S	HSP05008C	E03	HKY25R
PVVNN2525M16	●	VN <sup>○</sup> A VN <sup>○</sup> G VN <sup>○</sup> M	1604	25	25	150	38	25	12.5	PV322 (PV321) (PV323)	P11S	HSP05008C	E03	HKY25R

\*1 Clamp Torque (N · m) : HSP05008C=2.5

\*2 Please use shim no. PV321 and PV323 with RE0.4mm and RE1.2mm thick inserts. When using inserts, shim should be ordered separately.

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.



DVPN		Facing, Copying								DOUBLE CLAMP type					
										Finish	Light	Medium	Medium		
										FP	LP	MP	MK		
										(16)	(16)	(16)	(16)		
										Medium	Stainless	G Class	CBN		
										Standard	MM	R/L			
										(16)	(16)	(16)	(16)		

Order Number	Stock		Insert Number	Dimensions (mm)												
	R	L		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench	
DVPNR/L2020K16	●	★	VN:A VN:G VN:M	1604	20	20	125	32	20	25	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
DVPNR/L2525M16	●	●	VN:A VN:G VN:M	1604	25	25	150	32	25	32	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F

\* Clamp Torque (N · m) : DC0520T=3.5

PVPN		Facing, Copying								MP type					
										Finish	Light	Medium	Medium		
										FP	LP	MP	MK		
										(16)	(16)	(16)	(16)		
										Medium	Stainless	G Class	CBN		
										Standard	MM	R/L			
										(16)	(16)	(16)	(16)		

Order Number	Stock		Insert Number	Dimensions (mm)											
	R	L		H	B	LF	LH	HF	WF	Shim	Lock Pin	Lock Screw	Stop Ring	Wrench	
PVPNR/L2020K16	●	●	VN:A VN:G VN:M	1604	20	20	125	32	20	25	PV322 (PV321) (PV323)	P11S	HSP05008C	E03	HKY25R
PVPNR/L2525M16	●	●	VN:A VN:G VN:M	1604	25	25	150	32	25	32	PV322 (PV321) (PV323)	P11S	HSP05008C	E03	HKY25R

\*1 Clamp Torque (N · m) : HSP05008C=2.5

\*2 Please use shim no. PV321 and PV323 with RE0.4mm and RE1.2mm thick inserts. When using inserts, shim should be ordered separately.

DVPN type inserts	> A126 – A129
PVPN type inserts	> A126 – A129
PPCBN & PCD inserts	> B046, B047, B066

RECOMMENDED CUTTING CONDITIONS	> A074, B020
SPARE PARTS	> N001
TECHNICAL DATA	> P001

# EXTERNAL TURNING TOOLS

## WN INSERTS TOOL HOLDERS

EXTERNAL TURNING TOOLS

PWLN		External turning, Facing								LL type				Light	Medium
										LP	MP				
													 (06)	 (06)	
													Stainless		
													MM	 (06)	
Order Number	Stock	Insert Number		Dimensions (mm)						*2				*1	
	R L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench	
PWLNR/L1616H06	●●	WNMG	06T3	16	16	100	22	16	20	LLSWN3T3 (LLSWN32)	LLP13	LLCL13	LLCS106	HKY25R	
PWLNR/L2020K06	●●		06T3	20	20	125	22	20	25	LLSWN3T3 (LLSWN32)	LLP13	LLCL13	LLCS106	HKY25R	
PWLNR/L2525M06	●●		06T3	25	25	150	25	25	32	LLSWN3T3 (LLSWN32)	LLP13	LLCL13	LLCS106	HKY25R	

\*1 Clamp Torque (N · m) : LLCS106=2.2

\*2 Please use shim no. LLSWN32 with 4.76mm thick inserts. When using 4.76mm thick inserts, the shim should be ordered separately.

DWLN		External turning, DOUBLE CLAMP type Facing								Finish	Light	Medium	Medium		
										FP	LP	MP	MK		
										 (08)	 (06,08)	 (06,08)	 (08)		
										Medium Standard	Medium to Rough	Stainless	CBN		
										 (08)	 (08)	 (06,08)	 (08)		
Order Number	Stock	Insert Number		Dimensions (mm)						*2				*1	
	R L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
DWLNR/L1616H06	●●	WNMA WNMG WNGA	06T3	16	16	100	25	16	20	LLSWN3T3 (LLSWN32)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DWLNR/L2020K06	●●		06T3	20	20	125	25	20	25	LLSWN3T3 (LLSWN32)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DWLNR/L2020K06-T	●●		0604	20	20	125	25	20	25	LLSWN32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DWLNR/L2525M06	●●		06T3	25	25	150	25	25	32	LLSWN3T3 (LLSWN32)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DWLNR/L2525M06-T	●●		0604	25	25	150	25	25	32	LLSWN32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DWLNR/L2020K08	●●		0804	20	20	125	31	20	25	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DWLNR/L2525M08	●●		0804	25	25	150	31	25	32	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DWLNR/L3225P08	●●		0804	32	25	170	31	32	32	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

\*1 Clamp Torque (N · m) : DC0520T=3.5, DC0621T=5.0

\*2 Please use shim no. LLSWN32 with 4.76mm thick inserts. When using 4.76mm thick inserts, the shim should be ordered separately.

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

● : Inventory maintained.

PWLN type inserts > A130–A133  
DWLN type inserts > A130–A134

PCBN inserts > B048  
RECOMMENDED CUTTING CONDITIONS > A074, B020

MVLN		External turning, Facing		WP type		Finish		Light	Medium	Medium							
						FP	LP	MP	MK								
				Medium Standard		Medium to Rough RP		Stainless MM		CBN							
Order Number	Stock		Insert Number	Dimensions (mm)							Shim Shim Pin		Side Lock Plate Clamp Bridge		Clamp Screw Spring		Wrench
	R	L		H	B	LF	LH	HF	WF	Shim	Shim Pin	Side Lock Plate	Clamp Bridge	Clamp Screw*	Spring	Wrench	
MVLNR/L2020K08	●	●	WNMA WNMG WNGA	0804	20	20	125	32	20	25	WPSWN43	CCP34	CPT24	CCK13	SLCS105	MES2	HKY40R
MVLNR/L2525M08	●	●		0804	25	25	150	32	25	32	WPSWN43	CCP34	CPT24	CCK13	SLCS105	MES2	HKY40R
MVLNR/L3225P08	●	●		0804	32	25	170	32	32	32	WPSWN43	CCP34	CPT24	CCK13	SLCS105	MES2	HKY40R

\* Clamp Torque (N • m) : SLCS105=7.0

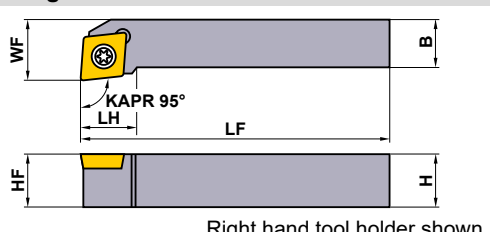
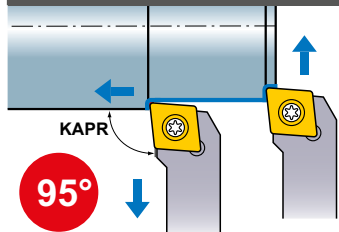
# EXTERNAL TURNING TOOLS











## SCLC

External turning, Facing

SP type



Right hand tool holder shown.

Finish	Light	Medium	Stainless
FP  (06,09)	LP  (06,09)	MP  (06,09,12)	FM  (06,09)
Stainless	Stainless	Flat top	PCD/CBN
LM  (06,09)	MM  (06,09,12)	 (06,09,12)	 (06,09,12)

Order Number	Stock		Insert Number	Dimensions (mm)							*1	
	R	L		H	B	LF	LH	HF	WF	Clamp Screw	Wrench	
SCLCR/L0808D06	●	●	CC○B	0602○	8	8	60	8.9	8	10	TS25	TKY08F
SCLCR/L1010E06	●	●	CC○H #2	0602○	10	10	70	8.9	10	12	TS25	TKY08F
SCLCR/L1212F09	●	●	CC○T	09T3○	12	12	80	13.6	12	16	TS43	TKY15F
SCLCR/L1616H12	●	●	CC○W	1204○	16	16	100	16.7	16	20	TS5	TKY25F

\*1 Clamp Torque (N • m) : TS25=1.0, TS43=3.5, TS5=7.5

\*2 When using CCGH and CCMH, it is recommended to use TS253 clamp screw.

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

EXTERNAL TURNING TOOLS

C

● : Inventory maintained.

SCLC type inserts	> A139 – A145
PCBN & PCD inserts	> B051, B052, B067
RECOMMENDED CUTTING CONDITIONS	> A074, B020

SDJC		External turning, Copying		SP type		Finish				Light				Medium				Stainless					
						FP	LP	MP	FM	FP	LP	MP	FM	FP	LP	MP	FM	FP	LP	MP	FM		
								 (07,11)				 (07,11)				 (07,11)				 (07,11)			
								Stainless				Stainless				Flat top				PCD/CBN			
								 (07,11)				 (07,11)				 (07,11)				 (07,11)			
								Stainless				Stainless				Flat top				PCD/CBN			
Order Number		Stock	Insert Number		Dimensions (mm)																		
		R L			H	B	LF	LH	HF	WF	Shim	Shim Screw	Clamp Screw	Wrench									
SDJCR/L1010E07		● ●	0702		10	10	70	12	10	12	—	—	TS25	TKY08F									
SDJCR/L1212F11		● ●	11T3		12	12	80	18	12	16	—	—	TS43	TKY15F									
SDJCR/L1616H11		● ●	11T3		16	16	100	18	16	20	—	—	TS43	TKY15F									
SDJCR/L2020K11		● ●	11T3		20	20	125	18	20	25	SPSDN32	JSS6	TS406	TKY15R									
SDJCR/L2525M11		● ●	11T3		25	25	150	25	25	32	SPSDN32	JSS6	TS406	TKY15R									

\* Clamp Torque (N · m) : TS25=1.0, TS43=3.5

SDNC		External turning, Copying		SP type		Finish				Light				Medium				Stainless					
						FP	LP	MP	FM	FP	LP	MP	FM	FP	LP	MP	FM	FP	LP	MP	FM		
								 (07,11)				 (07,11)				 (07,11)				 (07,11)			
								Stainless				Stainless				Flat top				PCD/CBN			
								 (07,11)				 (07,11)				 (07,11)				 (07,11)			
								Stainless				Stainless				Flat top				PCD/CBN			
Order Number		Stock	Insert Number		Dimensions (mm)																		
					H	B	LF	HF	WF	Shim	Shim Screw	Clamp Screw	Wrench										
SDNCN0808D07		●	0702		8	8	60	8	4	—	—	TS25	TKY08F										
SDNCN1010E07		●	0702		10	10	70	10	5	—	—	TS25	TKY08F										
SDNCN1212F11		●	11T3		12	12	80	12	6	—	—	TS43	TKY15F										
SDNCN1616H11		●	11T3		16	16	100	16	8	—	—	TS43	TKY15F										
SDNCN2525M11		●	11T3		25	25	150	25	12.5	SPSDN32	JSS6	TS406	TKY15R										

\* Clamp Torque (N · m) : TS25=1.0, TS43=3.5

SDJC type inserts > A147 – A152  
 SDNC type inserts > A147 – A152  
 PCBN & PCD inserts > B054, B055, B068

RECOMMENDED CUTTING CONDITIONS > A074, B020  
 SPARE PARTS > N001  
 TECHNICAL DATA > P001

# EXTERNAL TURNING TOOLS

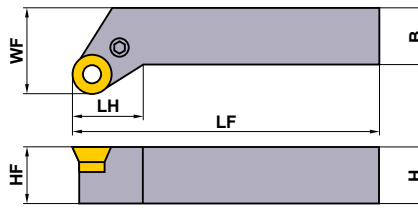
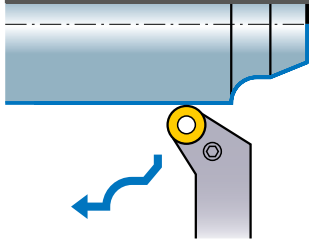
## RC INSERTS TOOL HOLDERS

### PRGC

External turning,  
Facing, Copying

LL type

Medium



Right hand tool holder shown.



Order Number	Stock		Insert Number	Dimensions (mm)						Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench	
	R	L		H	B	LF	LH	HF	WF						
PRGCR/L2525M10	●	●	RCMX	1003M0	25	25	150	16.7	25	32	LLSRN103	LLP13	LLCL110	LLCS205	HKY20R
PRGCR/L2525M12	●	●		1204M0	25	25	150	17.5	25	32	LLSRN123	LLP13	LLCL112	LLCS106	HKY25R
PRGCR/L2525M16	●	★		1606M0	25	25	150	19.9	25	32	LLSRN164	LLP24	LLCL116	LLCS306	HKY25R
PRGCR/L3232P20	●	●		2006M0	32	32	170	23.8	32	40	LLSRN204	LLP15	LLCL120	LLCS508	HKY30R

\* Clamp Torque (N · m) : LLCS205=1.5, LLCS106=2.2, LLCS306=2.2, LLCS508=3.3

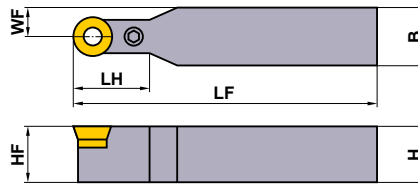
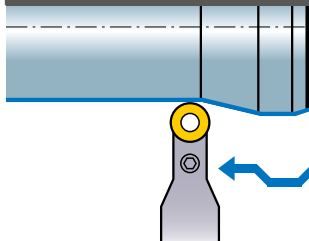
EXTERNAL TURNING TOOLS

### PRDC

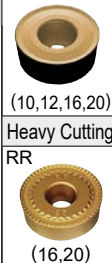
External turning,  
Copying

LL type

Medium



Neutral tool holder only.



Order Number	Stock		Insert Number	Dimensions (mm)						Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench	
	R	L		H	B	LF	LH	HF	WF						
PRDCN2020K10	●	●	RCMX	1003M0	20	20	125	23	20	10.0	LLSRN103	LLP13	LLCL110	LLCS205	HKY20R
PRDCN2525M12	●	●		1204M0	25	25	150	24	25	12.5	LLSRN123	LLP13	LLCL112	LLCS106	HKY25R
PRDCN3225P12	●	●		1204M0	32	25	170	24	32	12.5	LLSRN123	LLP13	LLCL112	LLCS106	HKY25R
PRDCN3225P16	●	●		1606M0	32	25	170	28	32	12.5	LLSRN164	LLP24	LLCL116	LLCS306	HKY25R
PRDCN3232P20	●	●		2006M0	32	32	170	33	32	16.0	LLSRN204	LLP15	LLCL120	LLCS508	HKY30R

\* Clamp Torque (N · m) : LLCS205=1.5, LLCS106=2.2, LLCS306=2.2, LLCS508=3.3

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

● : Inventory maintained. ★ : Inventory maintained in Japan.

PRGC type inserts > A154  
PRDC type inserts > A154  
RECOMMENDED CUTTING CONDITIONS > A074, B020

<b>SRGC</b>		External turning, Facing, Copying								<b>SP type</b>			
										Medium – Finish Cutting AZ  (08) Medium Standard  (06,08)			
Order Number		Stock		Insert Number		Dimensions (mm)				*			
		R L				H	B	LF	LH	HF	WF	Clamp Screw	Wrench
<b>SRGCR/L1616H06</b>		● ●		RCMT 0602		16	16	100	10	16	20	TS25	TKY08F
<b>SRGCR/L1616H08</b>		● ●		RCGT 0803		16	16	100	14.5	16	22	TS3	TKY08F

\* Clamp Torque (N • m) : TS25=1.0, TS3=1.0

EXTERNAL TURNING TOOLS

<b>SRDC</b>		External turning, Copying								<b>SP type</b>			
										Medium – Finish Cutting AZ  (08) Medium Standard  (06,08)			
Order Number		Stock		Insert Number		Dimensions (mm)				*			
		R L				H	B	LF	LH	HF	WF	Clamp Screw	Wrench
<b>SRDCN1616H06</b>		● ●		RCMT 0602		16	16	100	12	16	8	TS25	TKY08F
<b>SRDCN1616H08</b>		● ●		RCGT 0803		16	16	100	16	16	8	TS3	TKY08F

\* Clamp Torque (N • m) : TS25=1.0, TS3=1.0

SRGC type inserts > A154  
 SRDC type inserts > A154  
 RECOMMENDED CUTTING CONDITIONS > A074, B020

SPARE PARTS > N001  
 TECHNICAL DATA > P001

# EXTERNAL TURNING TOOLS

**SC** INSERTS  
TOOL HOLDERS

**SSSC** External turning, Chamfering, Facing **SP type**

Right hand tool holder shown.

Finish	Light	Medium	Stainless
FP (09)	LP (09)	MP (09,12)	FM (09)
Stainless	Stainless	Medium	Flat top
LM (09)	MM (09,12)	Standard (09,12)	(09,12)

Order Number	Stock		Insert Number	Dimensions (mm)						Shim	Shim Screw	Clamp Screw *	Wrench	
	R	L		H	B	LF	LH	HF	WF					
<b>SSSCR/L1212F09</b>	●	●	SCMW SCMT	09T3	12	12	80	15.2	12	13	—	—	TS43	TKY15F
<b>SSSCR/L1616H09</b>	●	●		09T3	16	16	100	15.2	16	17	—	—	TS43	TKY15F
<b>SSSCR/L2020K12</b>	●			1204	20	20	125	18	20	22	SPSSN42	JSS7	TS53	TKY25R
<b>SSSCR/L2525M12</b>	●			1204	25	25	150	25	25	27	SPSSN42	JSS7	TS53	TKY25R

\* Clamp Torque (N • m) : TS43=3.5

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

EXTERNAL TURNING TOOLS

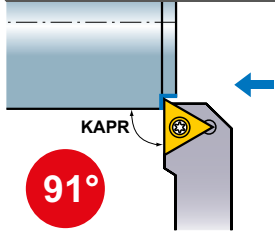
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● : Inventory maintained.

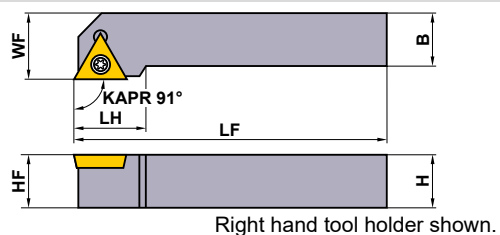
SSSC type inserts > A155, A156  
RECOMMENDED CUTTING CONDITIONS > A074, B020















## STGC



### External turning **SP type**



Finish	Light	Medium	Stainless
FP  (11,16)	LP  (11,16)	MP  (11,13,16)	FM  (11,16)
Stainless	Stainless	Flat top	PCD/CBN
LM  (11,16)	MM  (11,13,16)	 (11,13,16)	 (11,13,16)

Order Number	Stock		Insert Number	Dimensions (mm)										
	R	L		H	B	LF	LH	HF	WF	Shim				
STGCR/L1010E11	●	●	TCGT TCMT TCGW TCMW	1102	10	10	70	13.5	10	12	—	—	TS25	TKY08F
STGCR/L1212F13	●	●		1303	12	12	80	17.6	12	16	—	—	TS3	TKY08F
STGCR/L1616H16	●	●		16T3	16	16	100	20.7	16	20	—	—	TS43	TKY15F
STGCR/L2020K16	●	●		16T3	20	20	125	22.9	20	25	SPSTN32	JSS6	TS406	TKY15R

\* Clamp Torque (N • m) : TS25=1.0, TS3=1.0, TS43=3.5

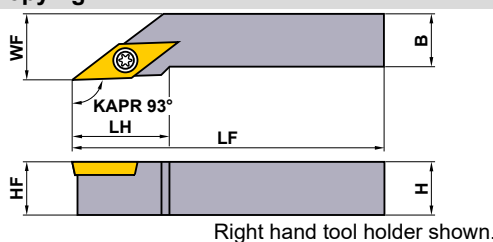
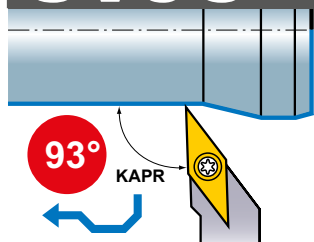
# EXTERNAL TURNING TOOLS

## VC INSERTS TOOL HOLDERS









### SVJC





External turning,  
Copying

SP type



Right hand tool holder shown.

Finish	Light	Medium	Stainless
FP  (11,16)	LP  (11,16)	MP  (16)	FM  (11,16)
Stainless	Stainless	Medium	Flat top
LM  (11,16)	MM  (16)	Standard  (11,16)	 (11,16)

Order Number	Stock		Insert Number	Dimensions (mm)										
	R	L		H	B	LF	LH	HF					WF	Shim
SVJCR/L1010E11	●	●	VCGT VCGW VCMT VCMW	1103	10	10	70	17	10	12	—	—	TS25	①TKY08F
SVJCR/L1616H16	●	●		1604	16	16	100	25	16	20	—	—	TS43	①TKY15F
SVJCR/L2020K16	●	●		1604	20	20	125	40	20	25	SPSVN32	BCP141	TS44	②TKY15R
SVJCR/L2525M16	●	●		1604	25	25	150	40	25	32	SPSVN32	BCP141	TS44	②TKY15R

\* Clamp Torque (N · m) : TS25=1.0, TS43=3.5, TS44=3.5

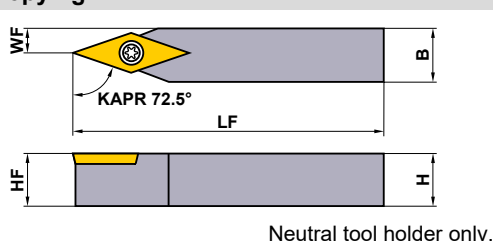
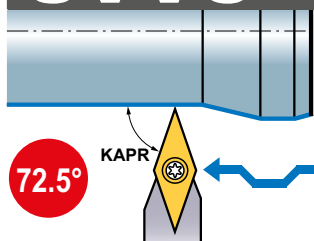
EXTERNAL TURNING TOOLS

C









### SVVC





External turning,  
Copying

SP type



Neutral tool holder only.

Finish	Light	Medium	Stainless
FP  (16)	LP  (16)	MP  (16)	FM  (16)
Stainless	Stainless	Medium	Flat top
LM  (16)	MM  (16)	Standard  (16)	 (16)

Order Number	Stock		Insert Number	Dimensions (mm)									
	R	L		H	B	LF	HF	WF					Shim
SVVCN1616H16	●	●	VCGT VCGW VCMT VCMW	1604	16	16	100	16	8	—	—	TS43	①TKY15F
SVVCN2020K16	●	●		1604	20	20	125	20	10	SPSVN32	BCP141	TS44	②TKY15R
SVVCN2525M16	●	●		1604	25	25	150	25	12.5	SPSVN32	BCP141	TS44	②TKY15R

\* Clamp Torque (N · m) : TS43=3.5, TS44=3.5

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

● : Inventory maintained.

SVJC type inserts > A167–A169  
SVVC type inserts > A167–A169

PCBN & PCD inserts > B060, B071  
RECOMMENDED CUTTING CONDITIONS > A074, B020

SVPC		Facing, Copying								SP type				
										Finish	Light	Medium	Stainless	
										FP	LP	MP	FM	
		 (16)	 (16)	 (16)	 (16)									
										Stainless	Stainless	Medium	Flat top	
										LM	MM	Standard		
										 (16)	 (16)	 (16)	 (16)	
Order Number	Stock		Insert Number		Dimensions (mm)									
	R	L			H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Screw *	Wrench
<b>SVPCR/L2020K16</b>	●	●	VCGT VCGW VCMT VCMW	1604	20	20	125	30	20	25	SPSVN32	BCP141	TS44	TKY15R
<b>SVPCR/L2525M16</b>	●	●		1604	25	25	150	30	25	32	SPSVN32	BCP141	TS44	TKY15R

\* Clamp Torque (N • m) : TS44=3.5

# EXTERNAL TURNING TOOLS

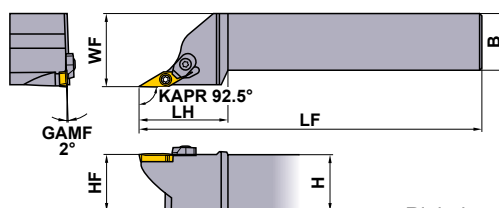
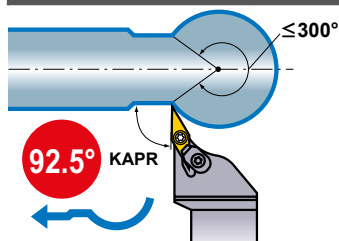
## XC INSERTS TOOL HOLDERS

### SXZC

External turning,  
Copying

Profile Holder

Finish  
SVX



Right hand tool holder shown.



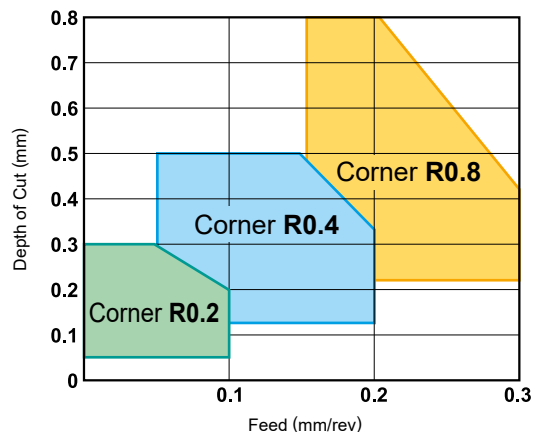
(15)

Order Number	Stock		Insert Number	Dimensions (mm)						* Clamp Screw		* Clamp Bridge		Spring	Insert Wrench	Wrench (Clamp bridge)			
	R	L		H	B	LF	LH	HF	WF	Clamp Screw	Clamp Bridge								
<b>SXZCR/L1616H15</b>	●	●	XCMT	1503	○	○	SVX	16	16	100	35	16	20	TS255	AMS3	AJS3010T10	ASS2	TKY08F	TKY10F
<b>SXZCR/L2020K15</b>	●	●		1503	○	○	SVX	20	20	125	35	20	25	TS255	AMS3	AJS3010T10	ASS2	TKY08F	TKY10F
<b>SXZCR/L2525M15</b>	●	●		1503	○	○	SVX	25	25	150	40	25	32	TS255	AMS3	AJS3010T10	ASS2	TKF08F	TKF10F

\* Clamp Torque (N · m) : TS255=1.0, AJS3010T10=2.5

EXTERNAL TURNING TOOLS

## APPLICABLE RANGE



## RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Grade	Cutting Speed (m/min)
<b>P</b> Mild Steel	$\leq 180\text{HB}$	<b>UE6020</b>	250 (150–350)
	150HB–250HB	<b>UE6020</b>	175 (100–250)
<b>M</b> Stainless Steel	$\leq 200\text{HB}$	<b>VP15TF</b>	100 (70–120)

Note 1) The above cutting conditions are general guidelines.

Adjustments may be necessary depending on machine rigidity, workpiece geometry and clamping.

Note 2) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

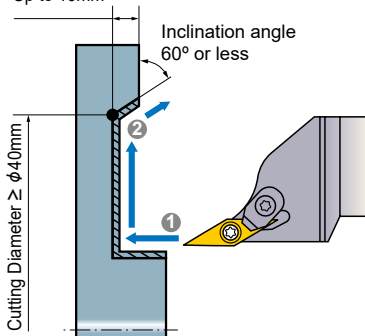
● : Inventory maintained.

## NOTE

### When end face copying

Pay special attention to the following when face copying.

Depth from end face  
Up to 10mm



#### ●Machining of an outer diameter (Step ①)

- To prevent burr formation, the depth of cut should be below half the nose radius.

#### ●Machining of an inclination (Step ②)

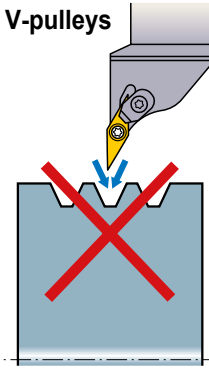
- To reduce the contact length of chips, the depth of cut should be below half the nose radius.
- To prevent interference between the tool and the workpiece, the cutting diameter should be 40mm or larger, inclination angle 60° or less and depth from the end face up to 10mm.

#### ●When changing inserts

- When indexing the inserts, it is recommended to preset the cutting edge position to maintain machining accuracy.

### Not possible

#### ●Machining of V-pulleys



When machining V-pulleys,  
use a VNMG insert.

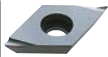
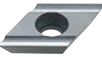
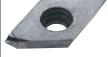
# EXTERNAL TURNING TOOLS [FOR ALUMINIUM]

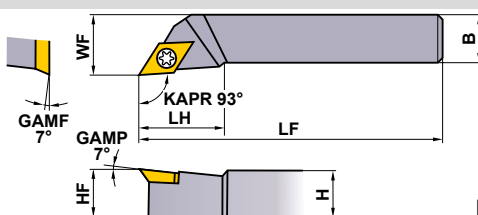
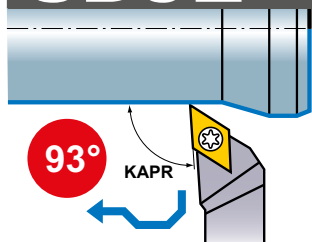
## DE INSERTS TOOL HOLDERS

### SDJE



External turning,  
Copying

AL type

Finish	Medium
R/L-F  (15)	R/L  (15)
PCD	
R/L-F  (15)	



Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)						* 		
	R	L		H	B	LF	LH	HF	WF			Clamp Screw
SDJER/L1616H15	●	●	DEGX	1504	16	16	100	27	16	20	CS451190T	TKY20F
SDJER/L2020K15	●	●		1504	20	20	125	35	20	25	CS451190T	TKY20F
SDJER/L2525M15	●	●		1504	25	25	150	35	25	32	CS451190T	TKY20F

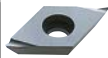
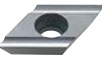

\* Clamp Torque (N · m) : CS451190T=5.0

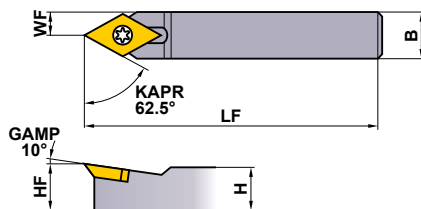
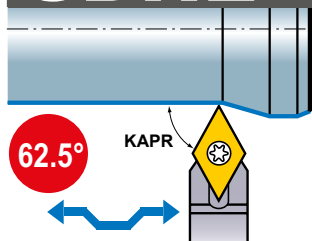
EXTERNAL TURNING TOOLS



### SDNE

External turning,  
Copying

AL type

Finish	Medium
R/L-F  (15)	R/L  (15)
PCD	
R/L-F  (15)	



Order Number	Stock		Insert Number	Dimensions (mm)						* 	
	R	L		H	B	LF	HF	WF	Clamp Screw		
SDNEN1616H15	●		DEGX	1504	16	16	100	16	8	CS451190T	TKY20F
SDNEN2020K15	●			1504	20	20	125	20	10	CS451190T	TKY20F
SDNEN2525M15	●			1504	25	25	150	25	12.5	CS451190T	TKY20F

\* Clamp Torque (N · m) : CS451190T=5.0

## RECOMMENDED CUTTING CONDITIONS

Work Material	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
N Aluminium Alloy	HTi10	400	0.05-0.3	0.2-3.0
	MD220	800	0.05-0.3	0.2-0.5

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

● : Inventory maintained. ★ : Inventory maintained in Japan.

SDJE type inserts > A153  
SDNE type inserts > A153  
PCD inserts > B073

STGE		External turning								AL type		Medium	PCD
										R/L	R/L	(16)	(16)
Order Number		Stock		Insert Number		Dimensions (mm)				*			
		R	L			H	B	LF	LH	HF	WF	Clamp Screw	Wrench
STGER/L1616H16		★	★	TEGX	1603	16	16	100	22	16	20	FC400890T	TKY10F
STGER/L2020K16		★	★		1603	20	20	125	22	20	25	FC400890T	TKY10F
STGER/L2525M16		★	★		1603	25	25	150	22	25	32	FC400890T	TKY10F

\* Clamp Torque (N · m) : FC400890T=2.5

STFE		Facing								AL type		Medium	PCD
										R/L	R/L	(16)	(16)
Order Number		Stock		Insert Number		Dimensions (mm)				*			
		R	L			H	B	LF	LH	HF	WF	Clamp Screw	Wrench
STFER/L1616H16		★	★	TEGX	1603	16	16	100	22	16	20	FC400890T	TKY10F
STFER/L2020K16		★	★		1603	20	20	125	22	20	25	FC400890T	TKY10F
STFER/L2525M16		★	★		1603	25	25	150	22	25	32	FC400890T	TKY10F

Note 1) When using inserts with right or left hand chipbreakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

\* Clamp Torque (N · m) : FC400890T=2.5

## RECOMMENDED CUTTING CONDITIONS

Work Material	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
N Aluminium Alloy	HTi10	400	0.05-0.3	0.2-3.0
	MD220	800	0.05-0.3	0.2-0.5

STGE type inserts > A161  
 STFE type inserts > A161  
 PCD inserts > B073

SPARE PARTS > N001  
 TECHNICAL DATA > P001

# EXTERNAL TURNING TOOLS [FOR ALUMINIUM]

**VD** INSERTS  
TOOL HOLDERS

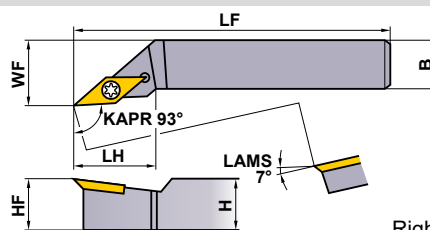
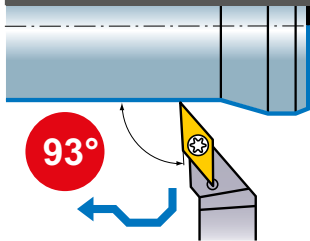
**SVJD**

External turning,  
Copying

**AL type**

Finish

R/L

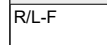


Right hand tool holder shown.





(16)

PCD



(16)

Order Number	Stock		Insert Number	Dimensions (mm)						* 		
	R	L		H	B	LF	LH	HF	WF	Clamp Screw	Wrench 	
<b>SVJDR/L1616H16</b>	★	★	VDGX	1603	16	16	100	30	16	20	FC400890T	TKY10F
<b>SVJDR/L2020K16</b>	★	★		1603	20	20	125	30	20	25	FC400890T	TKY10F
<b>SVJDR/L2525M16</b>	★	★		1603	25	25	150	30	25	32	FC400890T	TKY10F

\* Clamp Torque (N · m) : FC400890T=2.5

EXTERNAL TURNING TOOLS

## RECOMMENDED CUTTING CONDITIONS

Work Material	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
N Aluminium Alloy	HTi10	400	0.05-0.3	0.2-3.0
	MD220	800	0.05-0.3	0.2-0.5

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

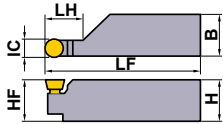
● : Inventory maintained. ★ : Inventory maintained in Japan.

SVJD type inserts > A170  
PCD inserts > B074

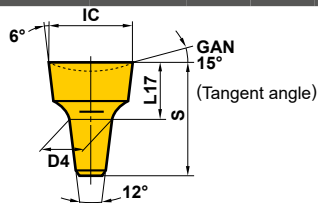


# TL HOLDER

## HOLDER

Geometry	Revised order number	Conventional order number	Stock	Insert Number	Dimensions (mm)					
					IC	H	B	HF	LF	LH
<b>TLHR</b> (External turning, Copying) 	<b>TLHR2020K5</b>	TLHR2020K5	●	RTG05A	5	20	20	20	125	16
	<b>TLHR2020K6</b>	TLHR2020K6	●	RTG06A	6	20	20	20	125	16
	<b>TLHR2525M7</b>	TLHR2525M7	●	RTG07A	7	25	25	25	150	20
	<b>TLHR3225P10</b>	TLHR54P10	●	RTG10A	10	32	25	32	170	25

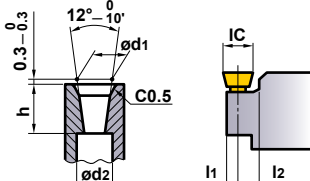
## INSERTS



Order Number	Stock		Dimensions (mm)			
	Carbide		IC	S	D4	L17
	UTi20T	HTi10				
RTG05A	●	●	5	7.5	2.5	3.5
RTG06A	●	●	6	7.5	3.5	3.5
RTG07A	●		7	11	3.5	5
RTG08A	●	●	8	11	4.5	5
RTG10A	●	●	10	14	5.5	6.5

## INSERT SEAT LOCATION

When manufacturing a special tool holder, please machine the insert seat in accordance to the drawing.

Insert Seat Dimensions	Insert Diameter IC	Dimensions (mm)					Taper Diameter
		h	d1	d2	l1	l2	
	5	4	2.5	1.9	1.85	3.2	1.5
	6	4	3.5	2.9	2.35	3.7	2.5
	7	6	3.5	2.5	2.75	4.3	2.1
	8	6	4.5	3.5	3.25	4.8	3.1
	10	7.5	5.5	4.2	4.15	5.9	3.8
	12	7.5	7.5	6.2	5.15	6.9	5.8

# Memo

---

A series of horizontal dashed lines for writing, spanning the width of the page.

# Memo

---

A series of horizontal dashed lines for writing, spanning the width of the page.

# HOW TO READ THE STANDARD OF SMALL TOOLS

## ●How this section page is organised

- ① Organised according to the cutting mode of small tools.  
(Refer to the inside title on the next page.)
- ② Shown as Turning → External Grooving → External Cutting Off → Threading → Boring.

### TYPE OF TOOL HOLDER

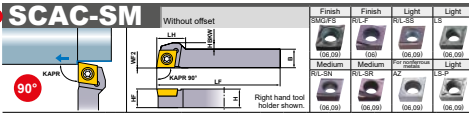
Indicates the first four letters of the order number, as well as cutting applications.

### APPLICATION

### PRODUCT SECTION

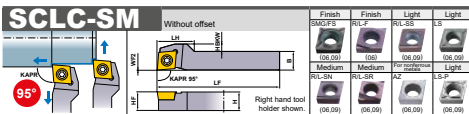
#### SMALL TOOLS

## EXTERNAL FRONT TURNING



Order Number	Stock	Insert Number	Dimensions (mm)										Clamp Screw	Wrench
			H	B	LF	LH	RBKW	HF	WF2	LF	LF	LF		
SCACRL0809K06-SM	+	0602	8	8	125	11	1.6	8	0	TS254	TKY09R			
SCACRL1010K06-SM	+	0602	10	10	125	—	—	10	0	TS254	TKY09R			
SCACRL1010K09-SM	+	09T3	10	10	125	16	3.5	10	0	TS43	TKY15R			
SCACRL1212M09-SM	+	09T3	12	12	150	14	1.5	12	0	TS43	TKY15R			
SCACRL1616M09-SM	+	09T3	16	16	150	—	—	16	0	TS43	TKY15R			

\* Clamp Torque (N·m) : TS254=1.0, TS43=3.5



Order Number	Stock	Insert Number	Dimensions (mm)										Clamp Screw	Wrench
			H	B	LF	LH	RBKW	HF	WF2	LF	LF	LF		
SCLCRL0809K06-SM	+	0602	8	8	125	11	2.1	8	0	TS254	TKY09R			
SCLCRL1010K06-SM	+	0602	10	10	125	—	—	10	0	TS254	TKY09R			
SCLCRL1010K09-SM	+	09T3	10	10	125	20	4	10	0	TS43	TKY15R			
SCLCRL1212M09-SM	+	09T3	12	12	150	18	2	12	0	TS43	TKY15R			
SCLCRL1616M09-SM	+	09T3	16	16	150	—	—	16	0	TS43	TKY15R			

\* Clamp Torque (N·m) : TS254=1.0, TS43=3.5

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.  
Note 2) Dimensions shown for insert corner RE 0.2.

● Inventory maintained. ★ Inventory maintained in Japan.

SCAC-SM type inserts	> A139 - A146
SCLC-SM type inserts	> A139 - A146
CBN & PCD inserts	> B051, B052, B067

### LEGEND FOR STOCK STATUS MARK

Is shown on the left hand page of each double-page spread.

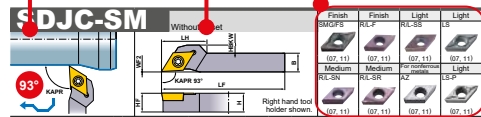
### PRODUCT STANDARDS

Indicates order numbers, stock status (per right/left hand), applicable inserts, dimensions, and spare parts.

FIGURE SHOWING THE TOOLING APPLICATION Uses illustrations and arrows to depict the available machining applications such as external turning, copying, facing, chamfering, threading, and grooving together with cutting edge lead angles.

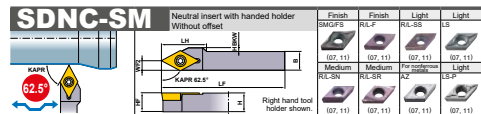
### GEOMETRY

### CHIPBREAKER BY CUTTING APPLICATION



Order Number	Stock	Insert Number	Dimensions (mm)										Clamp Screw	Wrench
			H	B	LF	LH	RBKW	HF	WF2	LF	LF	LF		
SDJCLR0809K07-SM	+	0702	8	8	125	16	2	8	0	TS254	TKY09R			
SDJCLR1010K07-SM	+	0702	10	10	125	—	—	10	0	TS254	TKY09R			
SDJCLR1010K11-SM	+	11T3	10	10	125	24	4	10	0	TS43	TKY15R			
SDJCLR1212M11-SM	+	11T3	12	12	150	22	2	12	0	TS43	TKY15R			
SDJCLR1616M11-SM	+	11T3	16	16	150	—	—	16	0	TS43	TKY15R			

\* Clamp Torque (N·m) : TS254=1.0, TS43=3.5



Order Number	Stock	Insert Number	Dimensions (mm)										Clamp Screw	Wrench
			H	B	LF	LH	RBKW	HF	WF2	LF	LF	LF		
SDNCLR0809K07-SM	+	0702	8	8	125	—	—	8	3	TS254	TKY09R			
SDNCLR1010K07-SM	+	0702	10	10	125	—	—	10	3	TS254	TKY09R			
SDNCLR1010K11-SM	+	11T3	10	10	125	24	2	10	5	TS43	TKY15R			
SDNCLR1212M11-SM	+	11T3	12	12	150	—	—	12	5	TS43	TKY15R			
SDNCLR1616M11-SM	+	11T3	16	16	150	—	—	16	5	TS43	TKY15R			

\* Clamp Torque (N·m) : TS254=1.0, TS43=3.5

### RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P Carbon Steel / Alloy Steel	180HB~260HB	MS6015/VP15TF	100 (50~150)	0.08 (0.01~0.15)
		MS6015	110 (30~180)	0.08 (0.01~0.15)
Free Cutting Steel	—	NX2555	150 (50~250)	0.08 (0.01~0.15)
		VP15TF/MP9005/MP9015	80 (50~120)	0.08 (0.02~0.1)
M Stainless Steel	520HB	MS9025	100 (50~180)	0.09 (0.01~0.15)
N Non-Ferrous Metal	—	HT10/MT9005	150 (70~230)	0.09 (0.03~0.15)
		MT9005	60 (40~80)	0.08 (0.04~0.12)
S Heat Resistant Alloy	—	MP9015/MS9025	50 (20~75)	0.08 (0.04~0.12)

SDJC-SM type inserts > A147 - A162  
SDNC-SM type inserts > A147 - A162  
CBN & PCD inserts > B054, B055, B066

SPARE PARTS > N001  
TECHNICAL DATA > P001

### REFERENCE PAGE FOR APPLICABLE INSERTS

Indicates reference pages giving details of inserts that are applicable to the product.

### PAGE REFERENCE

· SPARE PARTS  
· TECHNICAL DATA  
Indicates reference pages, including the above, on the right hand page of each double-page spread.

### RECOMMENDED CUTTING CONDITIONS

For each work material classification, indicates recommended cutting conditions according to the ISO categories for cutting grades, P, M, K and N.

# TURNING TOOLS

## SMALL TOOLS

OUTLINE OF SMALL TOOLS .....	D002
CLASSIFICATION .....	D006

### STANDARD OF SMALL TOOLS

#### EXTERNAL FRONT TURNING

SCAC-SM .....	D010
SCLC-SM .....	D010
SDJC-SM .....	D011
SDNC-SM .....	D011
SVLP-SM .....	D012
SVJB-SM .....	D012
SVJC-SM .....	D013
SVPP-SM .....	D013
SVVB-SM .....	D013

#### EXTERNAL BACK TURNING

BTAH .....	D014
CTBH .....	D015
BTVH .....	D016

#### EXTERNAL GROOVING

GTAH .....	D018
GTBH .....	D018
GTCH .....	D018

#### EXTERNAL CUTTING OFF

CTAH .....	D020
CTAH-S .....	D020
CTBH .....	D022

#### EXTERNAL THREADING

TTAH .....	D024
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#### EXTERNAL FRONT TURNING, COPYING, FACING

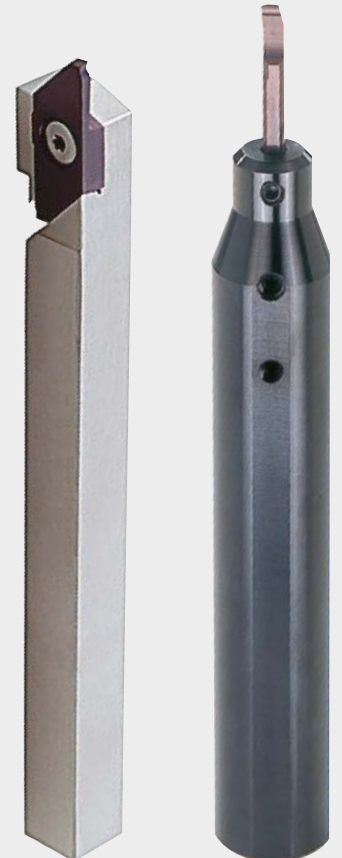
SH .....	D026
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\*Alphabetical order index

D014 BTAH  
 D014 BTAT (INSERTS)  
 D015 BTBT (INSERTS)  
 D016 BTVH  
 D016 BTVT (INSERTS)  
 D020 CTAH  
 D020 CTAH-S  
 D021 CTAT (INSERTS)  
 D015 CTBH  
 D022 CTBT (INSERTS)

D018 GTAH  
 D018 GTAT (INSERTS)  
 D018 GTBH  
 D018 GTBT (INSERTS)  
 D018 GTCH  
 D018 GTCT (INSERTS)  
 D010 SCAC-SM  
 D010 SCLC-SM  
 D011 SDJC-SM  
 D011 SDNC-SM

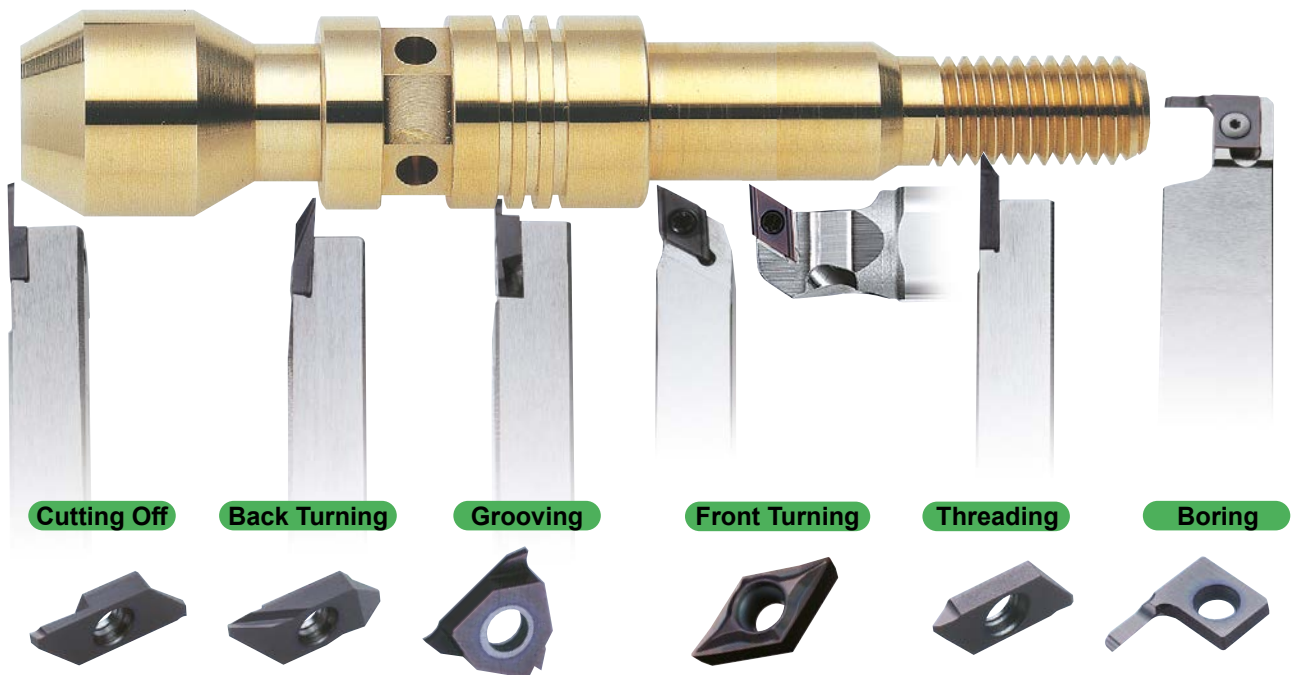
D012 SVJB-SM  
 D013 SVJC-SM  
 D012 SVLP-SM  
 D013 SVPP-SM  
 D013 SVVB-SM  
 D024 TTAH  
 D024 TTAT (INSERTS)



# OUTLINE OF SMALL TOOLS

TOOLS FOR GANG TYPE AUTOMATIC LATHES (FOR EXTERNAL TURNING AND BORING)

SMALL TOOLS



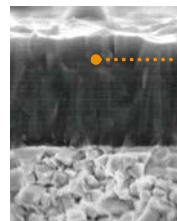
PVD Coated Cemented Carbide Grade for Carbon Steel

## MS6015

Ideal for turning pure iron, carbon and free cutting steels, and for achieving good surface finishes plus excellent dimensional accuracy.

	MS6015	Conventional
Coating	TiCN multilayer	TiAlN
Hardness (HV)	3,000	2,800
Wear Coefficient (Carbon Steel)	Low	High
Base Material Hardness (HRA)	92.0	92.0
T.R.S (GPa)	2.0	2.0

Ti-C-N Multilayer Coating



Superior wear and welding resistance and demonstrating the best possible results for machining carbon steel.

PVD Coated Grade for High Precision and Small Parts Machining

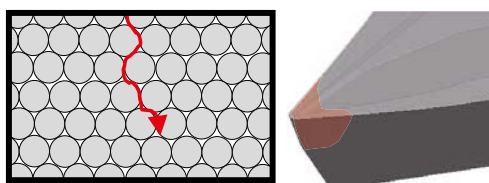
## MS9025 NEW

Effective reduction of notch wear with a balance of wear and fracture resistance.

### Improved Cemented Carbide

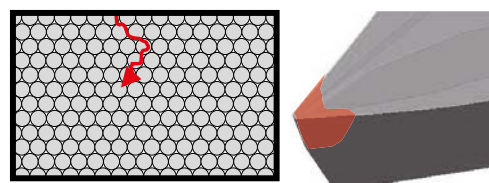
Thermal conductivity has been improved by optimising the grain size and therefore reducing the boundary contact between the WC particles. This optimisation reduces the temperature of the cutting edge during machining.

MS9025



Reducing the cutting edge temperature by improved thermal conductivity.

Conventional



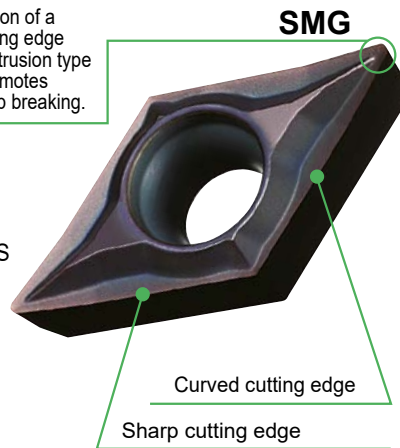
Higher cutting edge temperatures due to more particle boundary contact.

● Moulded breaker insert

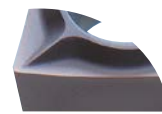
Nose radii designed with minus tolerance

- Suitable for small parts applications that often require minus tolerance dimensions.
- The order number is shown with the letter "M" that indicates minus tolerance. ex. DCGT11T301M-FS
- The radius value is printed on the side of the insert label for easy recognition.

A combination of a curved cutting edge and the protrusion type breaker promotes efficient chip breaking.



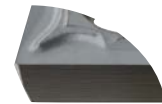
FS



FS-P



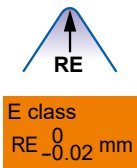
LS



LS-P

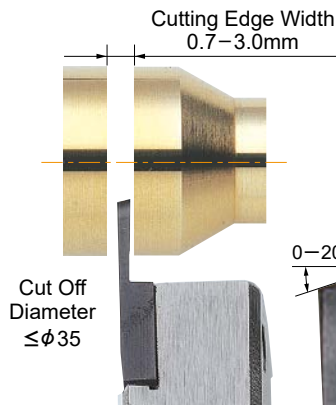


● Tolerance Corner R

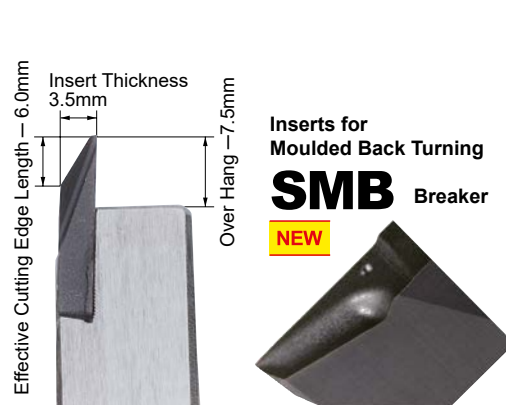


The letter "M" insert  
 $RE \begin{matrix} 0 \\ -0.05 \end{matrix} \text{ mm}$   
 (Conventional G-class insert  
 $RE \pm 0.10 \text{ mm}$ )

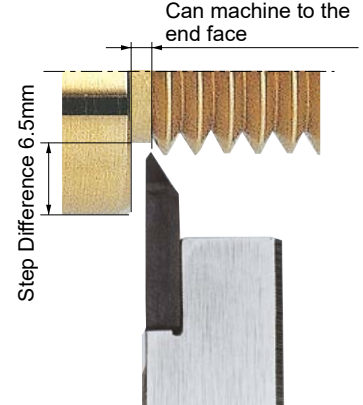
● Cutting Off



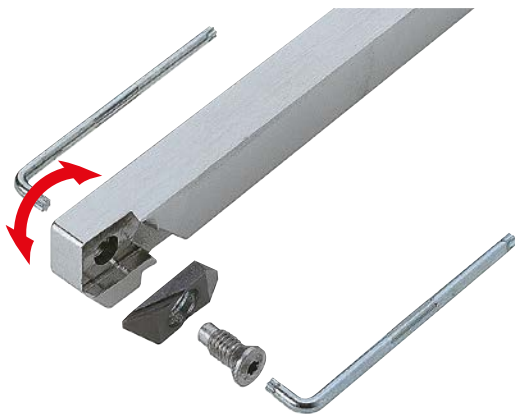
● Back Turning



● Threading



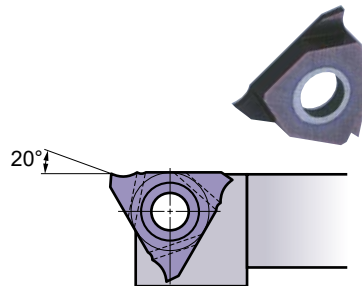
● Back Clamping Mechanism



Screw designed for front and back clamping.

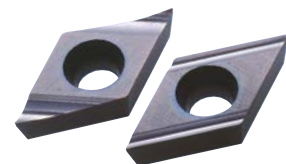
● Grooving

- 3 cutting edges
- Groove width 0.3-3.0mm
- Traversing possible



● Front Turning

- ISO E class accuracy inserts
- A wide variety of small corner R inserts
- Rake angle 30°



## Tools for an extensive range of small parts machining

External Turning	Tools for front turning, back turning, grooving, threading and cutting off
Internal Turning	Tools for boring, internal grooving and internal threading
Drilling	Drills
End Milling	End Mills

## Indexable inserts developed under the concept of "high quality, high efficiency and long tool life."

High Quality	E class tolerance, sharp cutting edge, high accuracy small corner R, smooth surface finish
Long Tool Life	PVD coating MS6015/VP15TF/MP9005/MP9015
High Efficiency	Regrinding not necessary due to the employment of indexable inserts. A wide variety of top cutting edge geometries

## Tools for CNC automatic and small lathes

Types of Tool Posts	Gang type, turret type, cam type (radial pattern type)
Tool Sizes	Square shank: 8–16 mm Round shank : less than $\phi 25.4$



## TOOLS FOR CAM TYPE AUTOMATIC LATHES

- The most suitable for the use with cam type automatic lathes (radial pattern tool posts)
- The most suitable for machining of small parts with work diameter 5mm or smaller
- Single holder for front turning, back turning, grooving, threading and cutting off operations





## INTERNAL TURNING TOOLS

### Solid type **MICRO-MINI TWIN Boring Bars**

Minimum cutting diameter  $\phi 2.2$ -

Boring  
Grooving  
Threading



Round Shank

Square Shank

## MICRO-DEX Boring Bars

Minimum cutting diameter  $\phi 5.0$ -



Minimum cutting diameter  $\phi 10.0$

## DIMPLE BAR

(Please see the Boring Bar section for these tools.)

## DRILLING TOOLS

Violet Coated Precision Drills

**VAPDS/VAPDM** (General)  
(For stainless steel)

**VAPDSCB**  
(For counter boring)

Solid Carbide Drill

**MVS/DWAE**

Solid Carbide Flat Bottom Drills

**MFE**

Solid Carbide Drills for  
Centreing and Chamfering

**DLE**

Micro Solid Carbide Drills

**MSE** Drills

**MSE/MSP** (Centre Drills)



Solid Gun Drill

Micro Solid Carbide Gun Drill  
with through coolant holes

**MGS**



## END MILLING TOOLS

Solid Carbide End Mill

**MSTAR / MSTAR Plus** End Mill Series

Vibration Control End Mills for  
Machining Difficult-to-Cut Materials

**SMART MIRACLE** End Mill Series



D

SMALL TOOLS

# CLASSIFICATION OF EXTERNAL TURNING TOOLS

## GANG TYPE TOOL POSTS

### ● FRONT TURNING

Name of Tool Holder	Shank Size (mm) (H x W x L)	Geometry
<b>SCAC-SM</b> ↻ D010	8 x 8 x 125 10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	90° KAPR
<b>SCLC-SM</b> ↻ D010	8 x 8 x 125 10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	95° KAPR
<b>SDJC-SM</b> ↻ D011	8 x 8 x 125 10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	93° KAPR
<b>SDNC-SM</b> ↻ D011	8 x 8 x 125 10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	62.5° KAPR
<b>SVLP-SM</b> ↻ D012	10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	95° KAPR
<b>SVJB-SM</b> ↻ D012	10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	93° KAPR
<b>SVJC-SM</b> ↻ D013	10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	93° KAPR
<b>SVPP-SM</b> ↻ D013	10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	117.5° KAPR
<b>SVVB-SM</b> ↻ D013	10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	72.5° KAPR

### ● BACK TURNING

Name of Tool Holder	Shank Size (mm) (H x W x L)	Geometry
<b>BTAH</b> (Insert Size 2.8, 3.5, 5.0mm) ↻ D014	8 x 10 x 120 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
<b>CTBH</b> (Insert Size 4.5, 6.0mm) ↻ D015	10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
<b>BTVH</b> (Insert Size 7.5mm) ↻ D016	10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	53° KAPR

### ● THREADING

Name of Tool Holder	Shank Size (mm) (H x W x L)	Geometry
<b>TTAH</b> ↻ D024	8 x 10 x 120 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	

### ● GROOVING

Name of Tool Holder	Shank Size (mm) (H x W x L)	Geometry
<b>GTAH</b> (Groove Width 0.3–3.0mm) ↻ D018	8 x 8 x 80 8 x 8 x 120 10 x 10 x 80 10 x 10 x 120 12 x 12 x 80 12 x 12 x 120 16 x 16 x 120	U Type ↑ E Type ↑ VT Type ↑
<b>GTBH</b> (Groove Width 1.45–3.0mm) ↻ D018	10 x 10 x 80 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	U Type ↑ E Type ↑ VT Type ↑
<b>GTCH</b> (Groove Width 2.5–3.0mm) ↻ D018	10 x 10 x 80 10 x 10 x 120	U Type ↑ E Type ↑ VT Type ↑

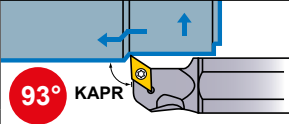
### ● CUTTING OFF

Name of Tool Holder	Shank Size (mm) (H x W x L)	Geometry
<b>CTAH</b> (Max. Cut Off Diameter 12mm) ↻ D020	8 x 10 x 120 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
<b>CTAH-S</b> (Max. Cut Off Diameter 12mm) ↻ D020	10 x 10 x 80	
<b>CTBH</b> (Max. Cut Off Diameter 16mm) ↻ D022	10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	


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SMALL TOOLS

## OPPOSITE TOOL POSTS

### ● DIMPLE SLEEVE HOLDER

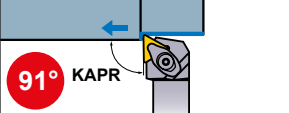
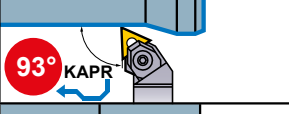
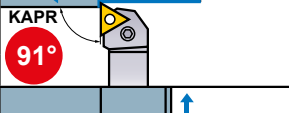

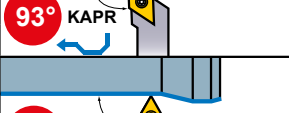

Name of Tool Holder	Shank Size (mm) (Shank Dia. x L)	Geometry
<b>SH</b> (Front Turning, Copying, Facing)	$\phi 15.875 \times 100$ $\phi 19.05 \times 125$ $\phi 20 \times 125$ $\phi 22 \times 125$ $\phi 25.4 \times 150$	 <b>93° KAPR</b>
➔ <b>D026</b>		

### ● THREADING

Name of Tool Holder	Shank Size (mm) (H x W x L)	Geometry
<b>MMT</b>	$12 \times 12 \times 100$ $16 \times 16 \times 100$ $20 \times 20 \times 125$ $25 \times 25 \times 150$ $32 \times 32 \times 170$	
➔ <b>G019</b>		

## TURRET TYPE TOOL POSTS

### ● FRONT TURNING

Name of Tool Holder	Shank Size (mm) (H x W x L)	Geometry
<b>DTGN</b>	$16 \times 16 \times 100$ $20 \times 20 \times 125$ $25 \times 25 \times 150$	 <b>91° KAPR</b>
➔ <b>C016</b>		
<b>MTJN</b>	$20 \times 20 \times 125$ $25 \times 25 \times 150$	 <b>93° KAPR</b>
➔ <b>C017</b>		
<b>PTGN</b>	$10 \times 10 \times 70$ $12 \times 12 \times 80$ $16 \times 16 \times 100$ $20 \times 20 \times 125$ $25 \times 25 \times 150$	 <b>91° KAPR</b>
➔ <b>C016</b>		
<b>SCLC</b>	$8 \times 8 \times 60$ $10 \times 10 \times 70$ $12 \times 12 \times 80$ $16 \times 16 \times 100$	 <b>95° KAPR</b>
➔ <b>C024</b>		
<b>SDJC</b>	$10 \times 10 \times 70$ $12 \times 12 \times 80$ $16 \times 16 \times 100$	 <b>93° KAPR</b>
➔ <b>C025</b>		
<b>SDNC</b>	$8 \times 8 \times 60$ $10 \times 10 \times 70$ $12 \times 12 \times 80$ $16 \times 16 \times 100$	 <b>62.5° KAPR</b>
➔ <b>C025</b>		



# CLASSIFICATION OF INTERNAL TURNING TOOLS (FOR GENERAL USE)

D  
SMALL TOOLS

Product Name	Holder	Product Name	Holder
<b>MICRO-MINI TWIN Boring Bars</b> (Solid Carbide) E021, E022	<b>CB CR</b>  Min. Cutting Diameter : 2.2mm	<b>DIMPLE BAR</b> (Steel Shank) (Carbide Shank) E010	<b>FSDUC FSDUC-E</b>  Min. Cutting Diameter : 14mm
<b>MICRO-MINI Boring Bars</b> (Solid Carbide) E024	<b>COFR-BLS</b>  Min. Cutting Diameter : 3.2mm	<b>DIMPLE BAR</b> (Steel Shank) (Carbide Shank) E011	<b>FSDQC FSDQC-E</b>  Min. Cutting Diameter : 13mm
<b>MICRO-DEX Boring Bars</b> (Carbide Shank) E018	<b>SCLC</b>  Min. Cutting Diameter : 5mm	<b>DIMPLE BAR</b> (Steel Shank) (Carbide Shank) E009	<b>FSTUP FSTUP-E</b>  Min. Cutting Diameter : 10mm
<b>MICRO-DEX Boring Bars</b> (Carbide Shank) E019	<b>STUC</b>  Min. Cutting Diameter : 8mm	<b>DIMPLE BAR</b> (Steel Shank) E013	<b>FSVUB/C</b>  Min. Cutting Diameter : 16mm
<b>MICRO-DEX Boring Bars</b> (Carbide Shank) E018	<b>SWUB</b>  Min. Cutting Diameter : 6mm	<b>DIMPLE BAR</b> (Steel Shank) E013	<b>FSVPB/C</b>  Min. Cutting Diameter : 16mm
<b>F type Bars</b> (Steel Shank) E029	<b>FSWL1</b>  Min. Cutting Diameter : 5.8mm	<b>DIMPLE BAR</b> (Steel Shank) E014	<b>FSVJB/C</b>  Min. Cutting Diameter : 16mm
<b>F type Bars</b> (Carbide Shank) E029	<b>FSWL2</b>  Min. Cutting Diameter : 5.8mm	<b>DIMPLE BAR</b> (Steel Shank) (Carbide Shank) E012	<b>FSWUB/P FSWUB/P-E</b>  Min. Cutting Diameter : 10mm
<b>DIMPLE BAR</b> (Steel Shank) (Carbide Shank) E007, E008	<b>FSCLC/P FSCLC/P-E</b>  Min. Cutting Diameter : 10mm		

# CLASSIFICATION OF INTERNAL TURNING TOOLS (GROOVING/THREADING) (END MILLING/DRILLING)





## FOR GROOVING AND THREADING

Product Name	Holder
<b>MICRO-MINI TWIN Boring Bars</b> (Solid Type) ➔ F127	<b>CG TYPE (Grooving)</b>  Min. Cutting Diameter : 3mm
<b>MICRO-MINI TWIN Boring Bars</b> (Solid Type) ➔ G031	<b>CT TYPE (Threading)</b>  Min. Cutting Diameter : 3mm

## END MILLS

Solid Carbide End Mill Series	➔ I026
HSS End Mill Series	➔ I034

## DRILLS

Product Name	Series Title
<b>Solid Carbide Drills</b> ➔ M036	<b>MVS series</b> 
<b>Solid Carbide Drills</b> ➔ M020	<b>DWAE series</b> 
<b>Centre Drills</b> ➔ M012	<b>DLE series</b> 
<b>Flat Bottom Drills</b> ➔ M018	<b>MFE series</b> 

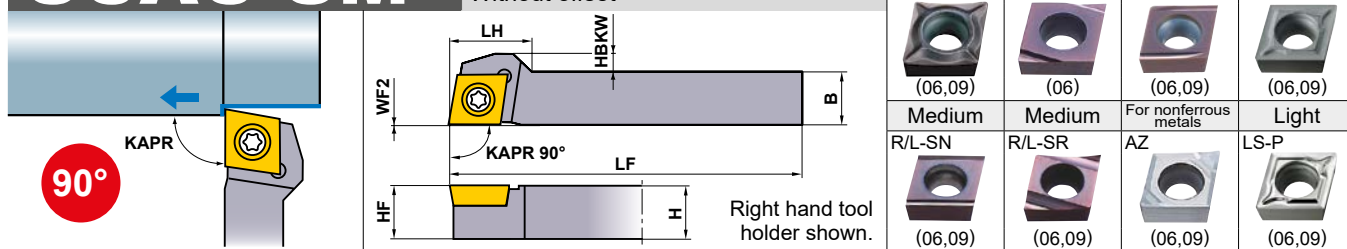
Solid Carbide Drill Series ➔ M004

Solid Gun Drill Series ➔ M079

HSS Drill Series ➔ M005

# EXTERNAL FRONT TURNING

## SCAC-SM

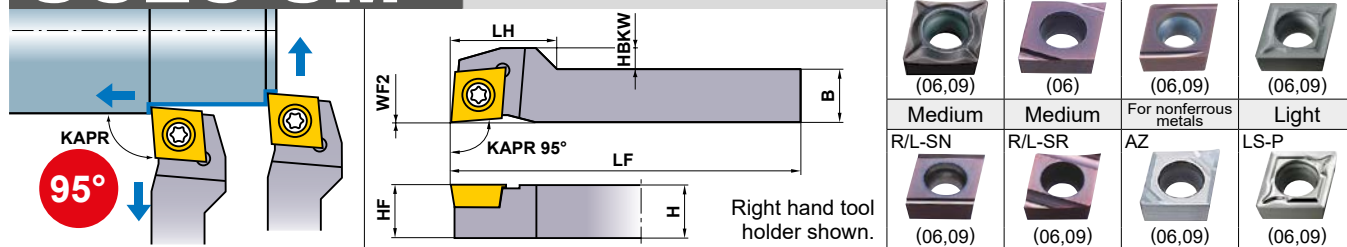


Finish	Finish	Light	Light
SMG/FS (06,09)	R/L-F (06)	R/L-SS (06,09)	LS (06,09)
Medium	Medium	For nonferrous metals	Light
R/L-SN (06,09)	R/L-SR (06,09)	AZ (06,09)	LS-P (06,09)

Order Number	Stock		Insert Number	Dimensions (mm)							*		
	R	L		H	B	LF	LH	HBKW	HF	WF2	Clamp Screw	Wrench	
SCACR/L0808K06-SM	●	★	CC●B CC●H CC●T CC●W	0602○○	8	8	125	11	1.6	8	0	TS254	TKY08R
SCACR/L1010K06-SM	●	★		0602○○	10	10	125	—	—	10	0	TS254	TKY08R
SCACR/L1010K09-SM	●	★		09T3○○	10	10	125	16	3.5	10	0	TS43	TKY15R
SCACR/L1212M09-SM	●	★		09T3○○	12	12	150	14	1.5	12	0	TS43	TKY15R
SCACR/L1616M09-SM	●	★		09T3○○	16	16	150	—	—	16	0	TS43	TKY15R

\* Clamp Torque (N · m) : TS254=1.0, TS43=3.5

## SCLC-SM



Finish	Finish	Light	Light
SMG/FS (06,09)	R/L-F (06)	R/L-SS (06,09)	LS (06,09)
Medium	Medium	For nonferrous metals	Light
R/L-SN (06,09)	R/L-SR (06,09)	AZ (06,09)	LS-P (06,09)

Order Number	Stock		Insert Number	Dimensions (mm)							*		
	R	L		H	B	LF	LH	HBKW	HF	WF2	Clamp Screw	Wrench	
SCLCR/L0808K06-SM	●	★	CC●B CC●H CC●T CC●W	0602○○	8	8	125	11	2.1	8	0	TS254	TKY08R
SCLCR/L1010K06-SM	●	★		0602○○	10	10	125	—	—	10	0	TS254	TKY08R
SCLCR/L1010K09-SM	●	★		09T3○○	10	10	125	20	4	10	0	TS43	TKY15R
SCLCR/L1212M09-SM	●	★		09T3○○	12	12	150	18	2	12	0	TS43	TKY15R
SCLCR/L1616M09-SM	●	★		09T3○○	16	16	150	—	—	16	0	TS43	TKY15R

\* Clamp Torque (N · m) : TS254=1.0, TS43=3.5

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

Note 2) Dimensions shown for insert corner RE 0.2.

SMALL TOOLS

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● : Inventory maintained. ★ : Inventory maintained in Japan.

SCAC-SM type inserts	> A139 – A145
SCLC-SM type inserts	> A139 – A145
CBN & PCD inserts	> B051, B052, B067

Order Number		Stock		Insert Number		Dimensions (mm)					*		
						H	B	LF	LH	HBKW	HF	WF2	Clamp Screw
<b>SDJCR/L0808K07-SM</b>	● ★	● ★	DCMT DCMW DCET DCGT DCGW	0702 $\odot\odot$	8	8	125	15	2	8	0	TS254	TKY08R
<b>SDJCR/L1010K07-SM</b>	● ★	● ★		0702 $\odot\odot$	10	10	125	—	—	10	0	TS254	TKY08R
<b>SDJCR/L1010K11-SM</b>	● ★	● ★		11T3 $\odot\odot$	10	10	125	24	4	10	0	TS43	TKY15R
<b>SDJCR/L1212M11-SM</b>	● ★	● ★		11T3 $\odot\odot$	12	12	150	22	2	12	0	TS43	TKY15R
<b>SDJCR/L1616M11-SM</b>	● ★	● ★		11T3 $\odot\odot$	16	16	150	—	—	16	0	TS43	TKY15R

\* Clamp Torque (N · m) : TS254=1.0, TS43=3.5

Order Number		Stock		Insert Number		Dimensions (mm)					*		
						H	B	LF	LH	HBKW	HF	WF2	Clamp Screw
<b>SDNCR/L0808K07-SM</b>	● ★	● ★	DCMT DCMW DCET DCGT DCGW	0702 $\odot\odot$	8	8	125	—	—	8	3	TS254	TKY08R
<b>SDNCR/L1010K07-SM</b>	● ★	● ★		0702 $\odot\odot$	10	10	125	—	—	10	3	TS254	TKY08R
<b>SDNCR/L1010K11-SM</b>	● ★	● ★		11T3 $\odot\odot$	10	10	125	24	2	10	5	TS43	TKY15R
<b>SDNCR/L1212M11-SM</b>	● ★	● ★		11T3 $\odot\odot$	12	12	150	—	—	12	5	TS43	TKY15R
<b>SDNCR/L1616M11-SM</b>	● ★	● ★		11T3 $\odot\odot$	16	16	150	—	—	16	5	TS43	TKY15R

\* Clamp Torque (N · m) : TS254=1.0, TS43=3.5

## RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
<b>P</b>	Carbon Steel · Alloy Steel	180HB–280HB	<b>MS6015/VP15TF</b>	100 (50–150)	0.08 (0.01–0.15)
	Free Cutting Steel	—	<b>MS6015</b>	110 (30–180)	0.08 (0.01–0.15)
			<b>NX2525</b>	150 (50–250)	0.08 (0.01–0.15)
<b>M</b>	Stainless Steel	≤200HB	<b>VP15TF/MP9005/MP9015</b>	80 (50–120)	0.06 (0.02–0.1)
		230HB	<b>MS9025</b>	100 (50–180)	0.08 (0.01–0.15)
<b>N</b>	Non-Ferrous Metal	—	<b>HTi10/MT9005</b>	150 (70–230)	0.09 (0.03–0.15)
<b>S</b>	Titanium Alloy	—	<b>MT9005</b>	60 (40–80)	0.08 (0.04–0.12)
	Heat Resistant Alloy	—	<b>MP9015/MS9025</b>	50 (20–75)	0.08 (0.04–0.12)

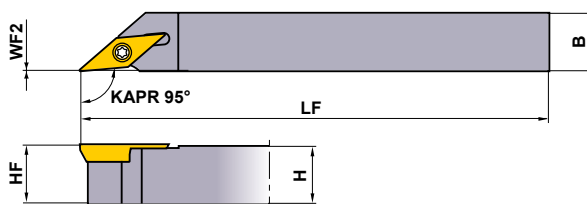
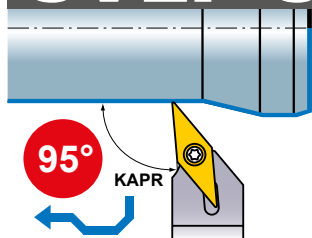
SDJC-SM type inserts > **A147–A152**  
SDNC-SM type inserts > **A147–A152**  
CBN & PCD inserts > **B054, B055, B068**

SPARE PARTS > **N001**  
TECHNICAL DATA > **P001**

# EXTERNAL FRONT TURNING

## SVLP-SM

Without offset



Right hand tool holder shown.

Finish  
R/L-SRF



(08,11)

Finish  
SMG



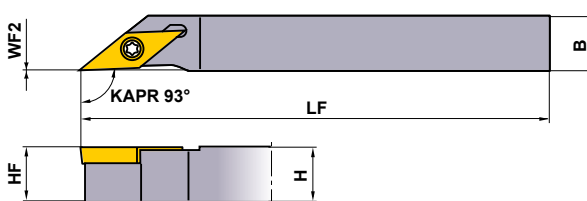
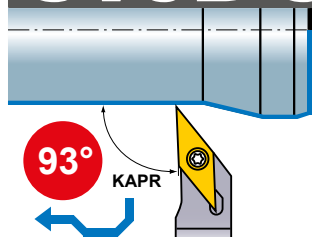
(08,11)

Order Number	Stock		Insert Number	Dimensions (mm)					* Clamp Screw	Wrench	
	R	L		H	B	LF	HF	WF2			
SVLPR/L1010K08-SM	●	★	VPET VPGT	0802	10	10	125	10	0	TS202	TKY06R
SVLPR/L1212M08-SM	●	★		0802	12	12	150	12	0	TS202	TKY06R
SVLPR/L1010K11-SM	●	★		1103	10	10	125	10	0	TS255	TKY08R
SVLPR/L1212M11-SM	●	★		1103	12	12	150	12	0	TS255	TKY08R
SVLPR/L1616M11-SM	●	★		1103	16	16	150	16	0	TS255	TKY08R

\* Clamp Torque (N · m) : TS202=0.6, TS255=1.0

## SVJB-SM

Without offset



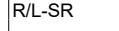
Right hand tool holder shown.

Finish  
R/L-F



(11)

Medium  
R/L-SN



(11)

Order Number	Stock		Insert Number	Dimensions (mm)					* Clamp Screw	Wrench	
	R	L		H	B	LF	HF	WF2			
SVJBR/L1010K11-SM	●	★	VBM VBET VBGT VBGW	1103	10	10	125	10	0	TS255	TKY08R
SVJBR/L1212M11-SM	●	★		1103	12	12	150	12	0	TS255	TKY08R
SVJBR/L1616M11-SM	●	★		1103	16	16	150	16	0	TS255	TKY08R

\* Clamp Torque (N · m) : TS255=1.0

## RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P Carbon Steel · Alloy Steel	180HB–280HB	MS6015/VP15TF	100 (50–150)	0.08 (0.01–0.15)
		MS6015	110 (30–180)	0.08 (0.01–0.15)
	Free Cutting Steel	–	NX2525	150 (50–250)
M Stainless Steel	≤200HB	VP15TF/MP9005/MP9015	80 (50–120)	0.06 (0.02–0.1)
	230HB	MS9025	100 (50–180)	0.08 (0.01–0.15)
N Non-Ferrous Metal	–	HTi10/MT9005	150 (70–230)	0.09 (0.03–0.15)
S Titanium Alloy	–	MT9005	60 (40–80)	0.08 (0.04–0.12)
	–	MP9015/MS9025	50 (20–75)	0.08 (0.04–0.12)



Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

Note 2) Dimensions shown for insert corner RE 0.2.



● : Inventory maintained. ★ : Inventory maintained in Japan.

SVLP-SM type inserts > A171  
SVJB-SM type inserts > A164–A166  
CBN & PCD inserts > B059, B071





Order Number		Stock		Insert Number		Dimensions (mm)				*  	
						H	B	LF	HBKW	HF	WF2
SVJCR/L1010JX11-SM	● ●	VCMW VCMT VCGT	1103	10	10	120	—	10	0	TS255	TKY08R
SVJCR/L1212JX11-SM	● ●		1103	12	12	120	—	12	0	TS255	TKY08R
SVJCR/L1616JX11-SM	● ●		1103	16	16	120	—	16	0	TS255	TKY08R
SVJCR/L1010JX13-SM	● ●		1303	10	10	120	2	10	0	TS32	TKY08R
SVJCR/L1212JX13-SM	● ●		1303	12	12	120	—	12	0	TS32	TKY08R
SVJCR/L1616JX13-SM	● ●		1303	16	16	120	—	16	0	TS32	TKY08R

\* Clamp Torque (N · m) : TS255=1.0, TS32=1.0

Order Number		Stock		Insert Number		Dimensions (mm)				*  		
						H	B	LF	LH	HBKW	HF	WF2
SVPPR/L1010K11-SM	● ★	VPET VPGT	1103	10	10	125	20	8	10	0	TS255	TKY08R
SVPPR/L1212M11-SM	● ★		1103	12	12	150	20	6	12	0	TS255	TKY08R
SVPPR/L1616M11-SM	● ★		1103	16	16	150	17	—	16	0	TS255	TKY08R

\* Clamp Torque (N · m) : TS255=1.0

Order Number		Stock		Insert Number		Dimensions (mm)				*  		
						H	B	LF	HF	WF2	Clamp Screw	Wrench
SVVBR/L1010K11-SM	● ★	VBET VBGT VBM VBGW	1103	10	10	125	10	3	10	3	TS255	TKY08R
SVVBR/L1212M11-SM	● ★		1103	12	12	150	12	3	12	3	TS255	TKY08R
SVVBR/L1616M11-SM	● ★		1103	16	16	150	16	3	16	3	TS255	TKY08R

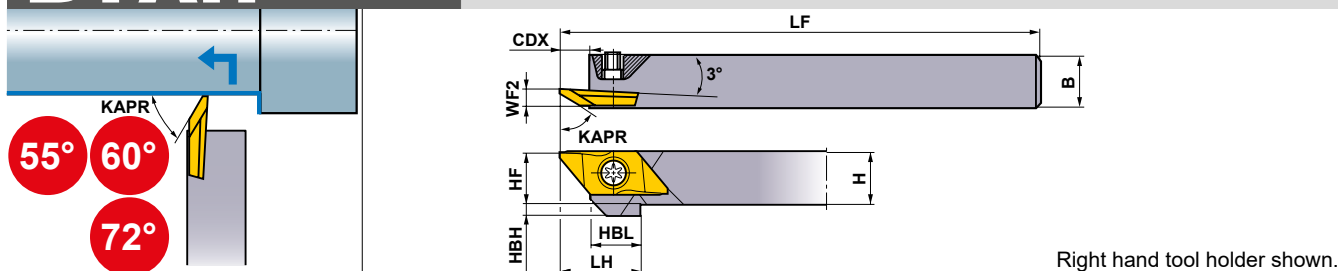
\* Clamp Torque (N · m) : TS255=1.0

SVJC-SM type inserts > A167–A169  
 SVPP-SM type inserts > A171  
 SVVB-SM type inserts > A164–A166

CBN & PCD inserts > B059, B060, B071  
 SPARE PARTS > N001  
 TECHNICAL DATA > P001

# EXTERNAL BACK TURNING

## BTAH



Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)										Clamp Screw *	Wrench			
	R	L		H	B	LF	LH	HF	WF2	HBH	HBL	CDX						
BTahr/L0810-50	●	★	BTAT	5528	○	○	R/L-B	8	10	120	15	8	3.5	4	9.5	5.5	NS402W	NKY15S
BTahr/L1010-50	●	★		6035	○	○	R/L-B	10	10	120	15	10	3.5	2	9.5	5.5	NS402W	NKY15S
BTahr/L1212-50	●	★		605000RX				12	12	120	15	12	3.5	—	9.5	5.5	NS403W	NKY15S
BTahr/L1616-50	●			7235	○	○	R-SMB	16	16	120	15	16	3.5	—	9.5	5.5	NS403W	NKY15S

Note 1) Please use right hand inserts for right hand holders and left hand inserts for left hand holders.

Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length (LE).

\* Clamp Torque (N · m) : NS402W=1.0, NS403W=1.0

## INSERTS

Order Number	Hand	Coated		Dimensions (mm)							LE* (mm)	Geometry
		VP15TF	NEW MS6015	PSIRR/L*	RER/L	CF	L	W1	CW	S		
NEW BTAT7235V5R-SMB	R	●		72°	0.05	0.3	20	8	1.4	2.5	3.5	With Breaker 
NEW BTAT723501MR-SMB	R	●		72°	0.08	0.3	20	8	1.4	2.5	3.5	
NEW BTAT723502MR-SMB	R	●		72°	0.18	0.3	20	8	1.4	2.5	3.5	
BTAT552800R-B	R	●	●	55°	0	0	20	8	0.5	2.5	2.8	EPSR 50° 
BTAT552800L-B	L	★		55°	0	0	20	8	0.5	2.5	2.8	
BTAT552801R-B	R	●	●	55°	0.1	0	20	8	0.5	2.5	2.8	
BTAT552801L-B	L	★		55°	0.1	0	20	8	0.5	2.5	2.8	
BTAT603500R-B	R	●	●	60°	0	0	20	8	0.5	2.5	3.5	SMB Type (Moulded) REL CW 16° PSIRR B Type (Grinding) REL CW 15° PSIRR Right hand insert shown.
BTAT603500L-B	L	★		60°	0	0	20	8	0.5	2.5	3.5	
NEW BTAT603501MR-B	R	●	●	60°	0.08	0	20	8	0.5	2.5	3.5	
BTAT603501R-B	R	●	●	60°	0.1	0	20	8	0.5	2.5	3.5	
BTAT603501L-B	L	★		60°	0.1	0	20	8	0.5	2.5	3.5	Without Breaker 
BTAT605000RX	R	●		60°	0	0	20	8	1.25	2.5	5.0	

Note 1) REL, PSIRR dimensions for Right Hand Tool and RER. PSIRL dimensions for Left Hand Tool.

\* Numeric value set insert on holder.

● = NEW

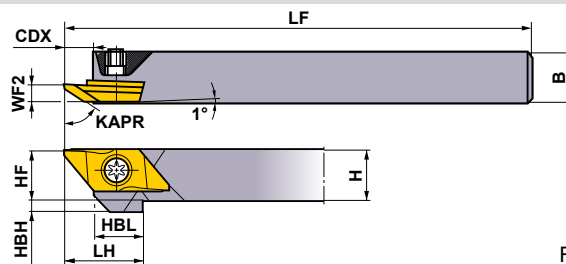
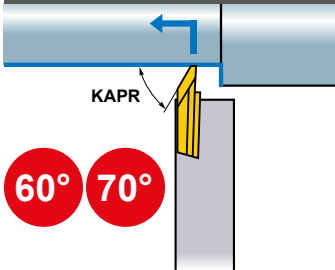
## RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P Carbon Steel · Alloy Steel	180HB–280HB	MS6015/VP15TF	100 (50–150)	0.08 (0.01–0.15)
	Free Cutting Steel	—	MS6015	110 (30–180)
M Stainless Steel	≤200HB	VP15TF	80 (50–120)	0.06 (0.02–0.1)
N Non-Ferrous Metal	—	MS6015	150 (70–230)	0.09 (0.03–0.15)



● : Inventory maintained. ★ : Inventory maintained in Japan.

(5 inserts in one case)

# CTBH



Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)								*  					
	R	L		H	B	LF	LH	HF	WF2	HBH	HBL	CDX	Clamp Screw	Wrench			
CTBHR/L1010-160	●	●	BTBT	60450	○	R/L-B	10	10	120	19.5	10	3.4	2	12	7.5	NS402W	NKY15S
CTBHR/L1212-160	●	●		606000	R/L	12	12	120	19.5	12	3.4	—	12	7.5	NS403W	NKY15S	
CTBHR/L1616-160	●	●		7055	○	R-SMB	16	16	120	19.5	16	3.4	—	12	7.5	NS403W	NKY15S

Note 1) Please use right hand inserts for right hand holders and left hand inserts for left hand holders.

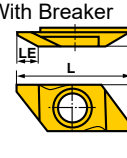
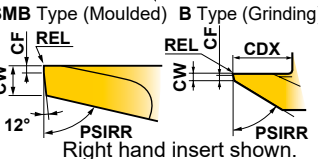
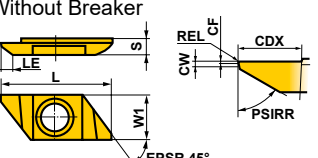
Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length (LE).

\* Clamp Torque (N · m) : NS402W=1.0, NS403W=1.0

D

SMALL TOOLS

## INSERTS

Order Number	Hand	Coated		Dimensions (mm)								LE* (mm)	Geometry
		VP15TF	NEW MS6015	PSIRRL*	RER/L	CF	L	W1	CW	S	CDX		
NEW BTBT7055V5R-SMB	R	●		70°	0.05	0.3	25	9.4	1.35	3.5	6.5	5.5	
NEW BTBT705501MR-SMB	R	●		70°	0.08	0.3	25	9.4	1.35	3.5	6.5	5.5	
NEW BTBT705502MR-SMB	R	●		70°	0.18	0.3	25	9.4	1.35	3.5	6.5	5.5	
BTBT604500R-B	R	●	●	60°	0	0.2	25	9.4	0.7	3.5	5.5	4.5	 <p>SMB Type (Moulded) B Type (Grinding)</p>
BTBT604500L-B	L	★		60°	0	0.2	25	9.4	0.7	3.5	5.5	4.5	
NEW BTBT604501MR-B	R		●	60°	0.08	0.3	25	9.4	0.7	3.5	5.5	4.5	
BTBT604501R-B	R	●	●	60°	0.1	0.3	25	9.4	0.7	3.5	5.5	4.5	
BTBT604501L-B	L	★		60°	0.1	0.3	25	9.4	0.7	3.5	5.5	4.5	
BTBT606000R	R	●		60°	0	0.2	25	9.4	0.7	3.5	7	6.0	
BTBT606000L	L	★		60°	0	0.2	25	9.4	0.7	3.5	7	6.0	 <p>Without Breaker</p> <p>Right hand insert shown.</p>

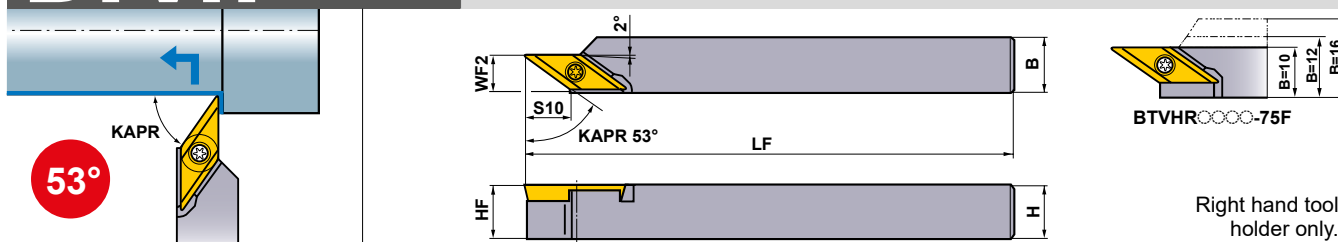
Note 1) REL, PSIRR dimensions for Right Hand Tool and RER. PSIRL dimensions for Left Hand Tool.

\* Numeric value set insert on holder.

● = NEW

# EXTERNAL BACK TURNING

## BTVH



Right hand tool holder only.

Order Number	Stock	Insert Number	Dimensions (mm)						*	
	R		H	B	LF	HF	WF2	S10	Clamp Screw	Wrench
BTVHR1010-75	●	BTVT 5375○○R-B	10	10	120	10	7.5	8.5	NS251	NKY15S
BTVHR1212-75	●		12	12	120	12	7.5	8.5	NS251	NKY15S
BTVHR1616-75	●		16	16	120	16	7.5	8.5	NS251	NKY15S
BTVHR1010-75F	●		10	10	120	10	10.0	8.5	NS251	NKY15S
BTVHR1212-75F	●		12	12	120	12	10.0	8.5	NS251	NKY15S
BTVHR1616-75F	●		16	16	120	16	10.0	8.5	NS251	NKY15S

Note 1) Set the maximum depth of cut at under 30% of the effective cutting edge length (LE).

Note 2) For high load machining, F type is recommended.

\* Clamp Torque (N · m) : NS251=1.0

## INSERTS

Order Number	Hand	Coated	Dimensions (mm)				LE* (mm)	Geometry
		VP15TF	IC	S	REL	CW		
BTVT5375V5R-B	R	●	6.35	3.18	0.05	0.5	7.5	With Breaker 
BTVT537501R-B	R	●	6.35	3.18	0.1	0.5	7.5	

\* Numeric value set insert on holder.

## RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel · Alloy Steel	180HB~280HB	VP15TF	100 (50-150)	0.08 (0.01-0.15)
	Free Cutting Steel	-	VP15TF	110 (30-180)	0.08 (0.01-0.15)
M	Stainless Steel	≤200HB	VP15TF	80 (50-120)	0.06 (0.02-0.1)
N	Non-Ferrous Metal	-	VP15TF	150 (70-230)	0.09 (0.03-0.15)

● : Inventory maintained.  
(5 inserts in one case)

SPARE PARTS > N001  
TECHNICAL DATA > P001

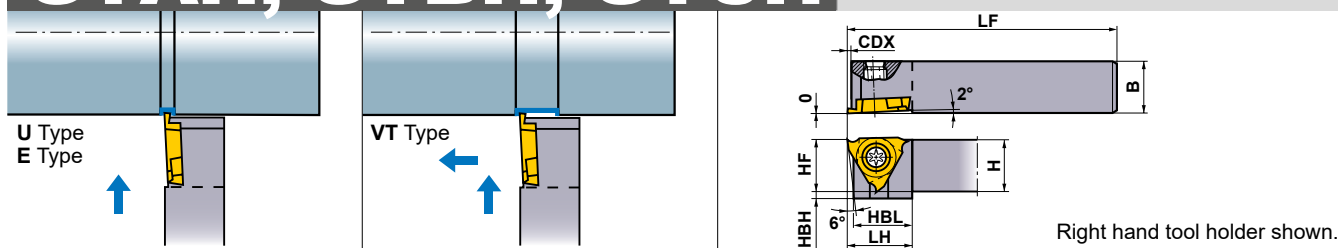
# Memo

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# EXTERNAL GROOVING

## GTAH, GTBH, GTCH



Order Number	Stock		Insert Number	Dimensions (mm)									Cutting Width (mm)	*2		
	R	L		H	B	HF	LF	CDX*1	LH	HBH	HBL	Clamp Screw		Wrench		
Standard Shank	GTAHR/L0808-20S	●	★	GTAT	○○○○	8	8	8	80	2	15	5	12.9	0.3-3.0	NS404W	NKY15S
	GTAHR/L1010-20S	●	★	GTBT *1	○○○○	10	10	10	80	2	15	3	12.9	0.3-3.0	NS404W	NKY15S
	GTAHR/L1212-20S	●	★	GTCT *1	○○○○	12	12	12	80	2	15	1	12.9	0.3-3.0	NS404W	NKY15S
	GTBHR/L1010-30S	●	★	GTBT. GTCT	○○○○	10	10	10	80	3	15	3	13.4	1.45-3.0	NS404W	NKY15S
	GTCHR/L1010-30S	★	★	GTCT	○○○○	10	10	10	80	3	15	3	13.4	2.5-3.0	NS404W	NKY15S
Long Shank	GTAHR/L0808-20	●	★	GTAT	○○○○	8	8	8	120	2	15	5	12.9	0.3-3.0	NS404W	NKY15S
	GTAHR/L1010-20	●	★	GTBT *1	○○○○	10	10	10	120	2	15	3	12.9	0.3-3.0	NS404W	NKY15S
	GTAHR/L1212-20	●	★	GTCT *1	○○○○	12	12	12	120	2	15	1	12.9	0.3-3.0	NS404W	NKY15S
	GTAHR/L1616-20	●	★	GTAT	○○○○	16	16	16	120	2	15	-	12.9	0.3-3.0	NS404W	NKY15S
	GTBHR/L1010-30	●	★	GTBT. GTCT	○○○○	10	10	10	120	3	15	3	13.4	1.45-3.0	NS404W	NKY15S
	GTBHR/L1212-30	●	★	GTBT. GTCT	○○○○	12	12	12	120	3	15	1	13.4	1.45-3.0	NS404W	NKY15S
	GTBHR/L1616-30	●	★	GTAT	○○○○	16	16	16	120	3	15	-	13.4	1.45-3.0	NS404W	NKY15S
	GTCHR/L1010-30	★	★	GTCT	○○○○	10	10	10	120	3	15	3	13.4	2.5-3.0	NS404W	NKY15S

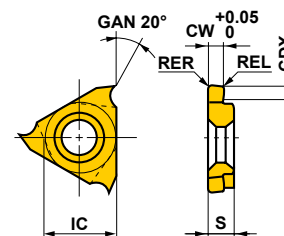
Note 1) Please use right hand inserts for right hand holders and left hand inserts for left hand holders.

\*1 It is not possible to machine depths over CDX dimensions (Max. Groove Depth).

\*2 Clamp Torque (N · m) : NS404W=1.0

### INSERTS

Order Number	Hand	Coated	Dimensions (mm)					Geometry
		VP15TF	CW	CDX*1	RER/L	IC	S	
GTAT03006V3R-U	R	●	0.3	0.6	0.03	9.525	3.18	U Type Breaker (General purpose Grooving)
GTAT03006V3L-U	L	★	0.3	0.6	0.03	9.525	3.18	
GTAT05012V5R-U	R	●	0.5	1.2	0.05	9.525	3.18	
GTAT05012V5L-U	L	★	0.5	1.2	0.05	9.525	3.18	
GTAT07520V5R-U	R	●	0.75	2.0	0.05	9.525	3.18	
GTAT07520V5L-U	L	★	0.75	2.0	0.05	9.525	3.18	
GTAT09520V5R-U	R	●	0.95	2.0	0.05	9.525	3.18	
GTAT09520V5L-U	L	★	0.95	2.0	0.05	9.525	3.18	
GTAT10020V5R-U	R	●	1.0	2.0	0.05	9.525	3.18	
GTAT10020V5L-U	L	★	1.0	2.0	0.05	9.525	3.18	
GTAT10320V5R-U	R	●	1.03	2.0	0.05	9.525	3.18	
GTAT12520V5R-U	R	●	1.25	2.0	0.05	9.525	3.18	
GTAT12520V5L-U	L	★	1.25	2.0	0.05	9.525	3.18	
GTBT14530V5R-U	R	●	1.45	3.0	0.05	9.525	3.18	
GTBT14530V5L-U	L	★	1.45	3.0	0.05	9.525	3.18	
GTBT15030V5R-U	R	●	1.5	3.0	0.05	9.525	3.18	
GTBT15030V5L-U	L	★	1.5	3.0	0.05	9.525	3.18	
GTBT17530V5R-U	R	●	1.75	3.0	0.05	9.525	3.18	
GTBT17530V5L-U	L	★	1.75	3.0	0.05	9.525	3.18	
GTBT20030V5R-U	R	●	2.0	3.0	0.05	9.525	3.18	
GTBT20030V5L-U	L	★	2.0	3.0	0.05	9.525	3.18	
GTCT25030V5R-U	R	★	2.5	3.0	0.05	9.525	3.18	
GTCT25030V5L-U	L	★	2.5	3.0	0.05	9.525	3.18	



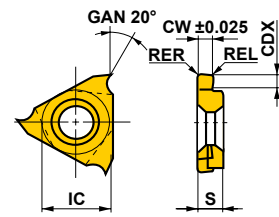
Right hand insert shown.

\*1 It is not possible to machine depths over CDX dimensions (Max. Groove Depth).

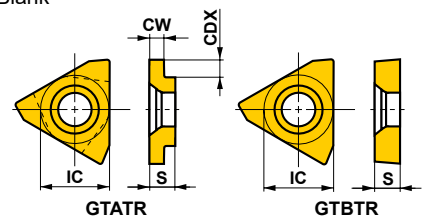
● : Inventory maintained. ★ : Inventory maintained in Japan.  
(5 inserts in one case)

# INSERTS

Order Number	Hand	Coated	Carbide	Dimensions (mm)					Geometry
		VP15TF	TF15	CW	CDX	RER/L	IC	S	
GTAT03306V3R-E	R	●		0.33	0.6	0.03	9.525	3.18	E Type Breaker (Ring processing Grooving)
GTAT03306V3L-E	L	★		0.33	0.6	0.03	9.525	3.18	
GTAT04312V3R-E	R	●		0.43	1.2	0.03	9.525	3.18	
GTAT04312V3L-E	L	★		0.43	1.2	0.03	9.525	3.18	
GTAT05312V5R-E	R	●		0.53	1.2	0.05	9.525	3.18	
GTAT05312V5L-E	L	★		0.53	1.2	0.05	9.525	3.18	
GTAT07520V5R-E	R	●		0.75	2.0	0.05	9.525	3.18	
GTAT07520V5L-E	L	★		0.75	2.0	0.05	9.525	3.18	
GTAT09520V5R-E	R	●		0.95	2.0	0.05	9.525	3.18	
GTAT09520V5L-E	L	★		0.95	2.0	0.05	9.525	3.18	
GTAT10020V5R-E	R	●		1.0	2.0	0.05	9.525	3.18	
GTAT10020V5L-E	L	★		1.0	2.0	0.05	9.525	3.18	
GTAT1002001R-E	R	●		1.0	2.0	0.1	9.525	3.18	
GTAT1002001L-E	L	★		1.0	2.0	0.1	9.525	3.18	
GTAT12020V5R-E	R	●		1.2	2.0	0.05	9.525	3.18	
GTAT12020V5L-E	L	★		1.2	2.0	0.05	9.525	3.18	
GTAT1202001R-E	R	●		1.2	2.0	0.1	9.525	3.18	
GTAT1202001L-E	L	★		1.2	2.0	0.1	9.525	3.18	
GTAT14020V5R-E	R	●		1.4	2.0	0.05	9.525	3.18	
GTAT14020V5L-E	L	★		1.4	2.0	0.05	9.525	3.18	
GTBT15030V5R-E	R	●		1.5	3.0	0.05	9.525	3.18	
GTBT15030V5L-E	L	★		1.5	3.0	0.05	9.525	3.18	
GTBT1503001R-E	R	●		1.5	3.0	0.1	9.525	3.18	
GTBT1503001L-E	L	★		1.5	3.0	0.1	9.525	3.18	
GTBT18030V5R-E	R	●		1.8	3.0	0.05	9.525	3.18	
GTBT18030V5L-E	L	★		1.8	3.0	0.05	9.525	3.18	
GTBT20030V5R-E	R	●		2.0	3.0	0.05	9.525	3.18	
GTBT20030V5L-E	L	★		2.0	3.0	0.05	9.525	3.18	
GTBT2003001R-E	R	●		2.0	3.0	0.1	9.525	3.18	
GTBT2003001L-E	L	★		2.0	3.0	0.1	9.525	3.18	
GTBT22530V5R-E	R	●		2.25	3.0	0.05	9.525	3.18	
GTBT22530V5L-E	L	★		2.25	3.0	0.05	9.525	3.18	
GTCT25030V5R-E	R	★		2.5	3.0	0.05	9.525	3.18	
GTCT25030V5L-E	L	★		2.5	3.0	0.05	9.525	3.18	
GTCT27530V5R-E	R	★		2.75	3.0	0.05	9.525	3.18	
GTCT27530V5L-E	L	★		2.75	3.0	0.05	9.525	3.18	
GTCT30030V5R-E	R	★		3.0	3.0	0.05	9.525	3.18	
GTCT30030V5L-E	L	★		3.0	3.0	0.05	9.525	3.18	
GTATR	R		★★	1.76	3.0	—	9.525	3.18	Blank
GTATL	L		★★	1.76	3.0	—	9.525	3.18	
GTBTR	R		★★	—	0	—	9.525	3.18	
GTBTL	L		★★	—	0	—	9.525	3.18	



Right hand insert shown.

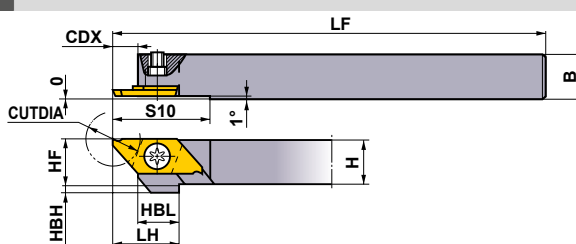
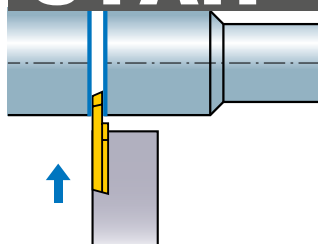


Right hand insert shown.

\* 10 inserts in one case.

# EXTERNAL CUTTING OFF

## CTAH



Right hand tool holder shown.

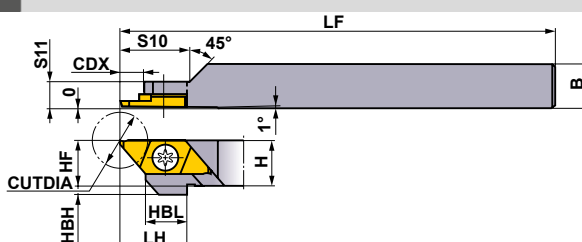
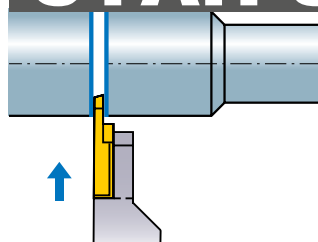
Order Number	Stock		Insert Number	Dimensions (mm)									CUTDIA (mm)	*2		
	R	L		H	B	HF	LF	LH	CDX	HBH	HBL	S10		Clamp Screw	Wrench	
CTAHR/L0810-120	●	●	CTAT	○	8	10	8	120	15	5.5	4	9.5	22	12 (8)*1	NS402W	NKY15S
CTAHR/L1010-120	●	●		○	10	10	10	120	15	5.5	2	9.5	22		NS402W	NKY15S
CTAHR/L1212-120	●	●		○	12	12	12	120	15	5.5	—	9.5	22		NS403W	NKY15S
CTAHR/L1616-120	●	●		○	16	16	16	120	15	5.5	—	9.5	22		NS403W	NKY15S

\*1 When the width of cutting off (CW) is 0.7mm.

\*2 Clamp Torque (N • m) : NS402W=1.0, NS403W=1.0

SMALL TOOLS

## CTAH-S



Right hand tool holder only.

Order Number	Stock		Insert Number	Dimensions (mm)										CUTDIA (mm)	*2		
	R	L		H	B	HF	LF	LH	CDX	HBH	HBL	S10	S11		Clamp Screw	Wrench	
CTAHR1010-120S	●		CTAT	○	10	10	10	80	15	16	2	9.5	16	5.5	12 (8)*1	NS401	NKY25R

\*1 When the width of cutting off (CW) is 0.7mm.

\*2 Clamp Torque (N • m) : NS401=3.5

### RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel · Alloy Steel	180HB—280HB	MS6015/VP15TF	100 (50—150)	0.05 (0.02—0.09)
	Free Cutting Steel	—	MS6015	110 (30—180)	0.05 (0.01—0.09)
M	Stainless Steel	≤200HB	VP15TF	80 (50—120)	0.03 (0.02—0.05)
N	Non-Ferrous Metal	—	MS6015	150 (70—230)	0.07 (0.03—0.11)

● : Inventory maintained.  
(5 inserts in one case)



# INSERTS

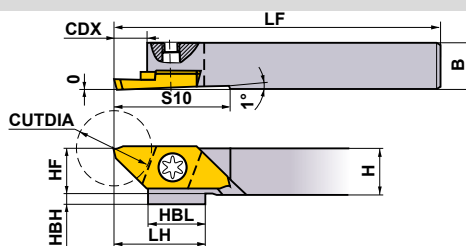
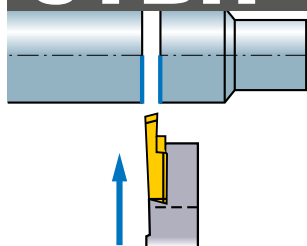
Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated		Dimensions (mm)								CUTDIA (mm)
							VP15TF	MS6015	CW	CDX	RER/L	L	W1	S	LBB		
Right Hand (R)	16°		<p>EPSCR 50°</p>	REL	CTAT07080V5RR-B	R	●		0.7	4.5	0.05	20	8	2.5	1.5	8	
				CDX	CTAT10120V5RR-B	R	●	●	1.0	6.7	0.05	20	8	2.5	1.5	12	
				LBB	CTAT15120V5RR-B	R	●	●	1.5	6.7	0.05	20	8	2.5	1.5	12	
				CW ±0.05	CTAT20120V5RR-B	R	●	●	2.0	6.7	0.05	20	8	2.5	1.5	12	
	16°				REL	CTAT15120V5RR-BX	R	●		1.5	6.7	0.05	20	8	2.5	1.5	12
					CDX	CTAT20120V5RR-BX	R	●		2.0	6.7	0.05	20	8	2.5	1.5	12
					LBB												
					CW ±0.05												
	0°	With Breaker			REL	CTAT10120V5RN-B	N	●	●	1.0	6.7	0.05	20	8	2.5	1.5	12
					CDX	CTAT15120V5RN-B	N	●	●	1.5	6.7	0.05	20	8	2.5	1.5	12
					LBB	CTAT20120V5RN-B	N	●	●	2.0	6.7	0.05	20	8	2.5	1.5	12
					CW ±0.05												
0°			REL	CTAT15120V5RN-BX	N	●		1.5	6.7	0.05	20	8	2.5	1.5	12		
			CDX	CTAT20120V5RN-BX	N	●		2.0	6.7	0.05	20	8	2.5	1.5	12		
			LBB														
			CW ±0.05														
16°			REL	CTAT10110V5RL-B	L	●		1.0	6.7	0.05	20	8	2.5	1.5	11		
			CDX	CTAT15110V5RL-B	L	●		1.5	6.7	0.05	20	8	2.5	1.5	11		
			LBB	CTAT20110V5RL-B	L	●		2.0	6.7	0.05	20	8	2.5	1.5	11		
20°	Without Breaker		REL	CTAT1012000RR	R	●	●	1.0	6.7	0	20	8	2.5	3.5	12		
			CDX	CTAT1512000RR	R	●	●	1.5	6.7	0	20	8	2.5	3.5	12		
			LBB	CTAT2012000RR	R	●	●	2.0	6.7	0	20	8	2.5	3.5	12		
16°			REL	CTAT07080V5LL-B	L	●		0.7	4.5	0.05	20	8	2.5	1.5	8		
			CDX	CTAT10120V5LL-B	L	●		1.0	6.7	0	20	8	2.5	1.5	12		
			LBB	CTAT15120V5LL-B	L	●		1.5	6.7	0	20	8	2.5	1.5	12		
			CW ±0.05	CTAT20120V5LL-B	L	●		2.0	6.7	0	20	8	2.5	1.5	12		
0°	With Breaker		REL	CTAT10120V5LN-B	N	●	●	1.0	6.7	0.05	20	8	2.5	1.5	12		
			CDX	CTAT15120V5LN-B	N	●	●	1.5	6.7	0.05	20	8	2.5	1.5	12		
			LBB	CTAT20120V5LN-B	N	●	●	2.0	6.7	0.05	20	8	2.5	1.5	12		
			CW ±0.05														
16°			REL	CTAT10110V5LR-B	R	●	●	1.0	6.7	0.05	20	8	2.5	1.5	11		
			CDX	CTAT15110V5LR-B	R	●	●	1.5	6.7	0.05	20	8	2.5	1.5	11		
			LBB	CTAT20110V5LR-B	R	●	●	2.0	6.7	0.05	20	8	2.5	1.5	11		
20°	Without Breaker		REL	CTAT1012000LL	L	●		1.0	6.7	0	20	8	2.5	3.5	12		
			CDX	CTAT1512000LL	L	●		1.5	6.7	0	20	8	2.5	3.5	12		
			LBB	CTAT2012000LL	L	●		2.0	6.7	0	20	8	2.5	3.5	12		

Right hand insert shown.

D  
SMALL TOOLS

# EXTERNAL CUTTING OFF

## CTBH



Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)									CUTDIA (mm)	*	
	R	L		H	B	HF	LF	LH	CDX	HBH	HBL	S10		Clamp Screw	Wrench
CTBHR/L1010-160	●	●	CTBT	10	10	10	120	19.5	7.5	2	9.5	25	16	NS402W	NKY15S
CTBHR/L1212-160	●	●		12	12	12	120	19.5	7.5	—	9.5	25	16	NS403W	NKY15S
CTBHR/L1616-160	●	●		16	16	16	120	19.5	7.5	—	9.5	25	16	NS403W	NKY15S

\* Clamp Torque (N · m) : NS402W=1.0, NS403W=1.0

D

SMALL TOOLS

## INSERTS

Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated		Dimensions (mm)							CUTDIA (mm)
							VP15TF	MS6015	CW	CDX	RER/L	L	W1	S		
Right Hand (R)					CTBT15160V5RR-B	R	●	●	1.5	9.2	0.05	25	9.4	3.5	16	
					CTBT20160V5RR-B	R	●	●	2.0	9.2	0.05	25	9.4	3.5	16	
					CTBT20160V5RN-B	N	●	●	2.0	9.2	0.05	25	9.4	3.5	16	
Left Hand (L)		With Breaker			CTBT20160V5LL-B	L	●		2.0	9.2	0.05	25	9.4	3.5	16	
					CTBT20160V5LN-B	N	●	●	2.0	9.2	0.05	25	9.4	3.5	16	
							CTBT20145V5LR-B	R	●	●	2.0	9.2	0.05	25	9.4	3.5

Right hand insert shown.

## RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel · Alloy Steel	180HB—280HB	MS6015/VP15TF	100 (50—150)	0.05 (0.02—0.09)
	Free Cutting Steel	—	MS6015	110 (30—180)	0.05 (0.01—0.09)
M	Stainless Steel	≤200HB	VP15TF	80 (50—120)	0.03 (0.02—0.05)
N	Non-Ferrous Metal	—	MS6015	150 (70—230)	0.07 (0.03—0.11)

● : Inventory maintained.  
(5 inserts in one case)

SPARE PARTS > N001  
TECHNICAL DATA > P001

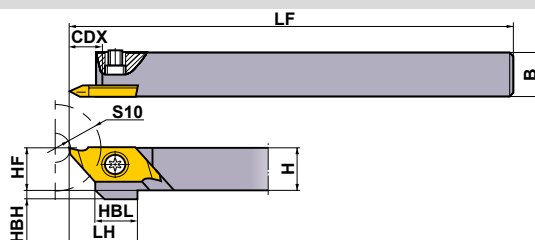
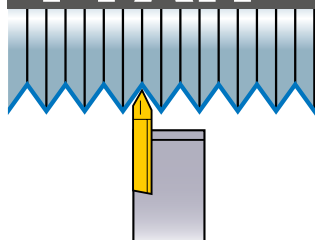
# Memo

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A series of horizontal dashed lines for writing, spanning the width of the page.

# EXTERNAL THREADING

## TTAH



Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)										*  	
	R	L		H	B	HF	LF	LH	HBH	HBL	CDX	S10	Clamp Screw	Wrench	
TTAHR/L0810	●	★	TTAT		8	10	8	120	15	4	9.5	7	6.5	NS402W	NKY15S
TTAHR/L1010	●	★			10	10	10	120	15	2	9.5	7	6.5	NS402W	NKY15S
TTAHR/L1212	●	★			12	12	12	120	15	—	9.5	7	6.5	NS403W	NKY15S
TTAHR/L1616	●	★			16	16	16	120	15	—	9.5	7	6.5	NS403W	NKY15S

\* Clamp Torque (N · m) : NS402W=1.0, NS403W=1.0

SMALL TOOLS

## INSERTS

Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated	Dimensions (mm)					Pitch of Screw mm (thread/inch)
							VP15TF	PDX	RE	L	W1	S	
Right Hand (R)			General Purpose Partial Profile (60°)		TTAT60075F5RR-B	R	●	0.4	0.05 Flat	20.0	8.0	2.5	0.2-0.75 (80-36)
					TTAT60125V5RR-B	R	●	0.8	0.05	20.0	8.0	2.5	0.5-1.25 (40-16)
					TTAT60075F5RL-B	L	●	0.4	0.05 Flat	20.0	8.0	2.5	0.2-0.75 (80-36)
					TTAT60125V5RL-B	L	●	0.8	0.05	20.0	8.0	2.5	0.5-1.25 (40-16)
Left Hand (L)		With Breaker	General Purpose Partial Profile (60°)		TTAT6015001RN-B	N	●	1.25	0.1	20.0	8.0	2.5	1.0-1.5 (24-18)
					TTAT60075F5LR-B	R	●	0.4	0.05 Flat	20.0	8.0	2.5	0.2-0.75 (80-36)
					TTAT60125V5LR-B	R	●	0.8	0.05	20.0	8.0	2.5	0.5-1.25 (40-16)
					TTAT60075F5LL-B	L	●	0.4	0.05 Flat	20.0	8.0	2.5	0.2-0.75 (80-36)
Right Hand (R)			General Purpose Partial Profile (55°)		TTAT60125V5LL-B	L	●	0.8	0.05	20.0	8.0	2.5	0.5-1.25 (40-16)
					TTAT6015001LN-B	N	●	1.25	0.1	20.0	8.0	2.5	1.0-1.5 (24-18)
					TTAT55158V5RR-B	R	●	0.8	0.05	20.0	8.0	2.5	(40-16)
					TTAT55158V5RL-B	L	●	0.8	0.05	20.0	8.0	2.5	(40-16)
Left Hand (L)			General Purpose Partial Profile (55°)		TTAT55158V5LR-B	R	●	0.8	0.05	20.0	8.0	2.5	(40-16)
					TTAT55158V5LL-B	L	●	0.8	0.05	20.0	8.0	2.5	(40-16)

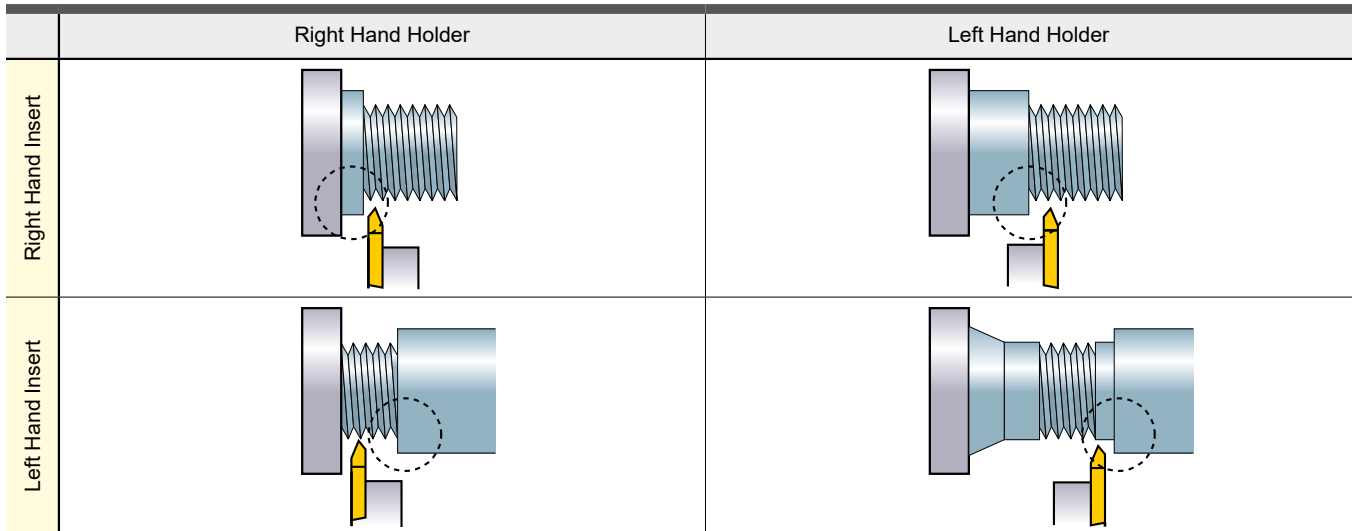
## RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Cutting Speed (m/min)
<b>P</b> Carbon Steel · Alloy Steel	180HB-280HB	100 (50-150)
Free Cutting Steel	—	110 (30-180)

Work Material	Hardness	Cutting Speed (m/min)
<b>M</b> Stainless Steel	≤200HB	80 (50-120)
<b>N</b> Non-Ferrous Metal	—	150 (70-230)

● : Inventory maintained. ★ : Inventory maintained in Japan.  
(5 inserts in one case)

## HOLDER APPLICATION



\*The above combinations enable to machine the side of

## THREAD RANGE

Application range

Pitch (mm)	Pitch Diameter of Thread (mm)										Number of Passes
	≥φ1.0	≥φ1.2	≥φ1.6	≥φ2.0	≥φ2.5	≥φ3.0	≥φ4.0	≥φ5.0	≥φ6.0	≥φ7.0	
0.2											2 – 4
0.25											3 – 5
0.3											4 – 6
0.35											5 – 7
0.4											6 – 8
0.45											
0.5											
0.6											
0.7											
0.75											
0.8											
1											
1.25											
1.5											

\*Metric Thread (60°)

Pitch(thread/inch)	Pitch Diameter of Thread									Number of Passes
Inch	≥φ0.060	≥φ0.073	≥φ0.086	≥φ0.099	≥φ0.112	≥φ0.164	≥φ0.190	≥φ0.250	≥φ0.313	
mm	≥φ1.524	≥φ1.854	≥φ2.184	≥φ2.515	≥φ2.845	≥φ4.166	≥φ4.826	≥φ6.350	≥φ7.938	
80										3 – 5
72										4 – 6
64										5 – 7
56										6 – 8
48										
44										
40										
32										
28										
26										
24										
20										
18										
16										

\*American UN, Whitworth

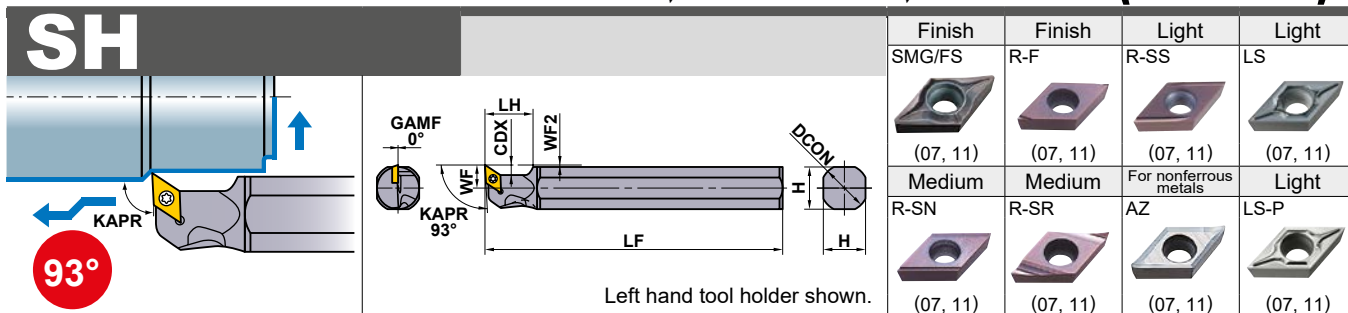
SPARE PARTS > N001  
TECHNICAL DATA > P001

D025



D

SMALL TOOLS

# EXTERNAL FRONT TURNING, COPYING, FACING (FOR OPPOSITE TOOL POSTS)



Left hand tool holder shown.

Order Number	Stock L	Insert Number	Dimensions (mm)								*  	
			DCON	LF	LH	H	WF	CDX	WF2	Clamp Screw	Wrench	
SH16H-FSDUCL07	★	DCMT DCMW DCET DCGT DCGW	0702	15.875	100	20	14	7.75	4.2	0.75	TS254	TKY08R
SH19K-FSDUCL07	★			19.05	125	20	17	9.25	4.2	0.75	TS254	TKY08R
SH20K-FSDUCL07	★			20	125	20	18	9.75	4.2	0.75	TS254	TKY08R
SH22K-FSDUCL07	★			22	125	20	20	10.75	4.2	0.75	TS254	TKY08R
SH25M-FSDUCL07	★			25.4	150	20	23	12.25	4.2	0.75	TS254	TKY08R
SH16H-FSDUCL11	★	DCMT DCMW DCET DCGT DCGW	11T3	15.875	100	20	15	7.75	6.4	0.75	TS43	TKY15R
SH19K-FSDUCL11	★			19.05	125	20	17	9.25	6.4	0.75	TS43	TKY15R
SH20K-FSDUCL11	★			20	125	20	18	9.75	6.4	0.75	TS43	TKY15R
SH22K-FSDUCL11	★			22	125	20	20	10.75	6.4	0.75	TS43	TKY15R
SH25M-FSDUCL11	★			25.4	150	20	23	12.25	6.4	0.75	TS43	TKY15R

Note 1) When using insert with right and left hand chipbreaker, please use right hand insert.

Note 2) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

\* Clamp Torque (N · m) : TS254=1.0, TS43=3.5

## RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P Carbon Steel · Alloy Steel	180HB–280HB	MS6015/VP15TF	100 (50–150)	0.08 (0.01–0.15)
		MS6015	110 (30–180)	0.08 (0.01–0.15)
	Free Cutting Steel	–	NX2525	150 (50–250)
M Stainless Steel	≤200HB	VP15TF/MP9005/MP9015	80 (50–120)	0.06 (0.02–0.1)
	230HB	MS9025	100 (50–180)	0.08 (0.01–0.15)
N Non-Ferrous Metal	–	HTi10/MT9005	150 (70–230)	0.09 (0.03–0.15)
S Titanium Alloy	–	MT9005	60 (40–80)	0.08 (0.04–0.12)
	–	MP9015/MS9025	50 (20–75)	0.08 (0.04–0.12)

★ : Inventory maintained in Japan.

SH type inserts

➤ A147–A152

CBN & PCD inserts

➤ B054, B055, B068

# Memo

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A series of horizontal dashed lines for writing, spanning the width of the page.

# HOW TO READ THE STANDARD OF BORING BARS

## ● How this section page is organised

- ① Organised by product series.  
(Refer to the index on the next page.)

### TYPE OF BORING BAR

Indicates the initial letters for the order number, as well as applicable insert types.

### TITLE OF PRODUCT SERIES

### PRODUCT SECTION

### PRODUCT FEATURES

FIGURE SHOWING THE TOOLING APPLICATION  
Uses illustrations and arrows to depict available machining applications along with cutting edge lead angles.

### GEOMETRY

### CHIPBREAKER BY CUTTING APPLICATION

**BORING BARS**

**DIMPLE BAR**

**FSCL/P/E**

Excellent vibration resistance due to light dimple head.  
Chip disposal is improved by having thin channels for chip evacuation.  
A laser printed scale on the side for easy installation (Steel shank).  
Scale is 1/3 times the diameter. (Carbide shank is 3/8 times the diameter).

Order Number	Block	Insert Number	DCON	LF	LDRED	WF	H	GAMP	DMIN	Minimum thread lead ratio	Wrench	
FSCL1008RL-08E	●	0802	8	140	13.8	5	7.2	12°	10	7	TS23	TKY08F
FSCL1008R-08E-2/3	●	CC-B	8	90	13.8	5	7.2	12°	10	5	TS25	TKY08F
FSCL1008R-08E-1/2	●	CC-H	8	70	13.8	5	7.2	12°	10	3	TS25	TKY08F
FSCL1210RL-08E	●	0802	10	160	16.0	6	9	5°	12	7.5	TS20	TKY10F
FSCL1210R-08E-2/3	●	0802	10	105	16.0	6	9	5°	12	5	TS20	TKY10F
FSCL1210R-08E-1/2	●	0802	10	80	16.0	6	9	5°	12	3	TS20	TKY10F
FSCL1412RL-08E	●	0802	12	180	17.8	7	11	4°	14	8	TS20	TKY10F
FSCL1412R-08E-2/3	●	0802	12	120	17.8	7	11	4°	14	5	TS20	TKY10F
FSCL1412R-08E-1/2	●	0802	12	90	17.8	7	11	4°	14	3	TS20	TKY10F
FSCL1816RL-09E	●	0903	16	220	21.8	9	15	3.5°	18	8	TS40	TKY15F
FSCL1816R-09E-2/3	●	0903	16	145	21.8	9	15	3.5°	18	5	TS40	TKY15F
FSCL1816R-09E-1/2	●	0903	16	110	21.8	9	15	3.5°	18	3	TS40	TKY15F
FSCL2220RL-09E	●	0903	20	250	24.0	11	19	2°	22	8	TS40	TKY15F
FSCL2220R-09E-2/3	●	0903	20	165	24.0	11	19	2°	22	5	TS40	TKY15F
FSCL2220R-09E-1/2	●	0903	20	125	24.0	11	19	2°	22	3	TS40	TKY15F

\*1 Clamp Torque (N·m) : TS23=1.0, TS20=0.6, TS25=1.0, TS10=2.5, TS40=3.5  
\*2 By changing the clamp screw, it is possible to use the different insert. Please refer to page E008.

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.  
Note 2) Dimensions shown for insert corner R0.4. (Model of 1/2 blank is R0.8.)  
Note 3) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

● Inventory maintained. \* Inventory maintained in Japan.

CC: type inserts > A139-A145  
CP: type inserts > A146  
CBN & PCD inserts > B081-B083, B087

**BORING BARS**

**FSUP**

Carbide shank with coolant hole

TP Inserts

Finish SV Light Medium

Order Number	Block	Insert Number	DCON	LF	LDRED	WF	H	GAMP	DMIN	Minimum thread lead ratio	Wrench	
FSUP1008RL-08A	●	0802	8	125	16	5	7.2	10°	10	3	TS20	TKY08F
FSUP1210RL-09A	●	0902	10	150	22.5	6	9	8°	12	3.5	TS20	TKY08F
FSUP1412RL-09A	●	0902	12	150	27	7	11	7°	14	4	TS20	TKY08F
FSUP1816RL-11A	●	1103	16	180	36	9	15	4°	18	5	TS30	TKY10F
FSUP2220RL-11A	●	1103	20	220	45	11	19	0°	22	5	TS30	TKY10F
FSUP3220RL-16A	●	1603	25	270	56.3	16	23.4	0°	32	5	TS40	TKY15F

\*1 Clamp Torque (N·m) : TS20=0.6, TS25=1.0, TS10=2.5, TS40=3.5  
\*2 By changing the clamp screw, it is possible to use the different insert. Please refer to page E008.

TP: type inserts > A162, A163  
CBN & PCD inserts > B087, B088, B090

CUTTING CONDITIONS > E014  
SPARE PARTS > N001  
TECHNICAL DATA > P001

### LEGEND FOR STOCK STATUS MARK

Is shown on the left hand page of each double-page spread.

### REFERENCE PAGE FOR APPLICABLE INSERTS

Indicates reference pages for details of inserts that are applicable to the title product.

### PRODUCT STANDARDS

Indicates order numbers, stock status (per right/left hand), applicable inserts, dimensions, minimum cutting diameters, standard corner radius, recommended l/d ratios, and spare parts.

### MIN. CUTTING DIAMETER

Is colour-coded to let you find, at a glance, the maximum / minimum cutting diameters for internal machining.

### PAGE REFERENCE

- SPARE PARTS
- TECHNICAL DATA

Indicates reference pages, including the above, on the right hand page of each double-page spread.



# TURNING TOOLS

# BORING BARS

CLASSIFICATION OF BORING TOOLS.....	E002
IDENTIFICATION .....	E004

## STANDARD OF BORING BARS

FEATURES OF DIMPLE BAR .....	E006
DIMPLE BAR.....	E007
DOUBLE CLAMP DIMPLE BAR.....	E015
MICRO-DEX BORING BARS.....	E018
MICRO-MINI TWIN BORING BARS .....	E021
MICRO-MINI BORING BARS.....	E024
F TYPE BORING BARS.....	E027
S TYPE BORING BARS.....	E030
P TYPE BORING BARS.....	E037
AL TYPE BORING BARS .....	E041



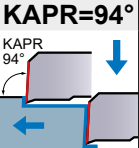
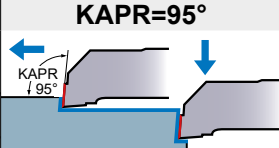
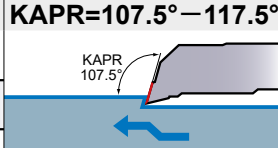
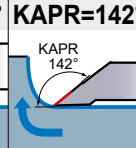
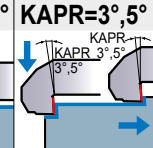
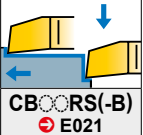
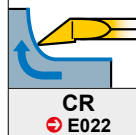
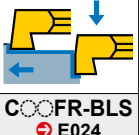

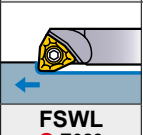
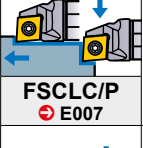
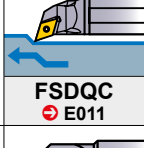
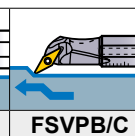
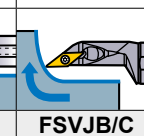
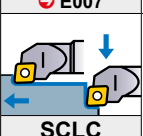
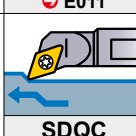
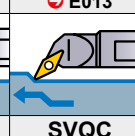
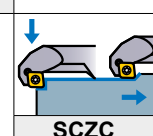
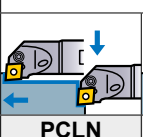
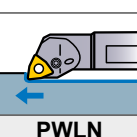
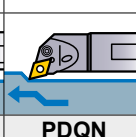
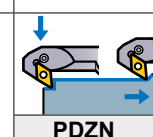
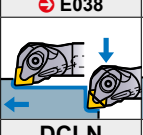
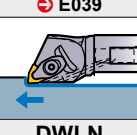
### \*Alphabetical order index

E015 A○○○-DCLN	E019 C○○○STUC	E020 RBH
E015 A○○○-DDUN	E034 C○○○SVQC	E025 RBH
E016 A○○○-DSKN	E018 C○○○SWUB	E032 S○○○SCLC
E016 A○○○-DTFN	E021 CB	E036 S○○○SCZC
E017 A○○○-DVUN	E022 CR	E033 S○○○SDQC
E017 A○○○-DWLN	E028 FCTU1	E031 S○○○SDUC
E038 A○○○PCLN	E028 FCTU2	E035 S○○○SSKC
E039 A○○○PDQN	E007 FSCLC/P	E030 S○○○STFC
E038 A○○○PDUN	E011 FSDQC	E041 S○○○STFE
E040 A○○○PDZN	E010 FSDUC	E034 S○○○SVQC
E037 A○○○PSKN	E027 FSTU1	E035 S○○○SVUC
E037 A○○○PTFN	E027 FSTU2	E026 SBH
E039 A○○○PWLN	E009 FSTUP	
E024 C○○○-BLS	E014 FSVJB/C	
E018 C○○○SCLC	E013 FSVPB/C	
E032 C○○○SCLC	E013 FSVUB/C	
E033 C○○○SDQC	E029 FSWL1	
E031 C○○○SDUC	E029 FSWL2	
E030 C○○○STFC	E012 FSWUB/P	

# CLASSIFICATION

Name of Tool Holder	DMIN Minimum Cutting Diameter	Features	KAPR=75°		KAPR=91°	KAPR=93°			
<b>MICRO-MINI TWIN Boring Bars</b> 	φ2.2 – φ8.2	<ul style="list-style-type: none"> <li>● Solid carbide type with two cutting edges.</li> <li>● Continuous cutting from boring to facing.</li> <li>● With or without a chipbreaker.</li> </ul>							
<b>MICRO-MINI Boring Bars</b> 	φ3.2 – φ5.2	<ul style="list-style-type: none"> <li>● Solid carbide type (Single cutting edges).</li> <li>● l/d is 5 times the diameter.</li> <li>● Cutting edge can be shaped according to the application. Thus, it covers a wide cutting range (threading, grooving, copying, etc.).</li> </ul>							
<b>MICRO-DEX Boring Bars (Carbide Shank)</b> 	φ5 – φ8	<ul style="list-style-type: none"> <li>● 5°, 7° positive insert.</li> <li>● Carbide shank type.</li> <li>● Easy-to-use tool geometries.</li> <li>● Suitable for small workpieces.</li> <li>● l/d is 5 times the diameter.</li> </ul>							
<b>F Type Boring Bars</b> 	φ5.8 – φ40	<ul style="list-style-type: none"> <li>● 11° positive insert.</li> <li>● Screw-on type and Clamp-on type.</li> <li>● l/d is 3 to 5 times the diameter.</li> <li>● FSWL type is 7° positive insert.</li> </ul>							
<b>DIMPLE BAR</b> 	φ10 – φ40	<ul style="list-style-type: none"> <li>● 5°, 7°, 11° positive inserts.</li> <li>● Excellent vibration resistance due to a light dimple head.</li> <li>● l/d is 3 to 5 times the diameter (Carbide shank is 3 to 8 times the diameter).</li> </ul>							
<b>S Type Boring Bars</b> 	φ11 – φ50	<ul style="list-style-type: none"> <li>● ISO standard.</li> <li>● 7° positive insert.</li> <li>● Screw-on type.</li> <li>● l/d is 3 to 5 times the diameter (Carbide shank is 7 times the diameter).</li> </ul>							
<b>AL Type Boring Bars (For Aluminium Alloy)</b> 	φ20 – φ32	<ul style="list-style-type: none"> <li>● Suitable for non-ferrous metal.</li> <li>● 20° positive insert.</li> <li>● Screw-on type.</li> <li>● l/d is 6 times the diameter.</li> <li>● Excellent vibration resistance.</li> </ul>							
<b>P Type Boring Bars</b> 	φ20 – φ70	<ul style="list-style-type: none"> <li>● ISO standard.</li> <li>● Economical negative insert.</li> <li>● Lever lock type, and pin lock type.</li> <li>● l/d is 3 times the diameter.</li> </ul>							
<b>DOUBLE CLAMP DIMPLE BAR</b> 	φ32 – φ50	<ul style="list-style-type: none"> <li>● Economical negative insert.</li> <li>● Single action type.</li> <li>● Excellent vibration resistance due to a light dimple head. (With coolant hole.)</li> <li>● l/d is 3 to 4 times the diameter.</li> </ul>							

Note 1) Holders with blue colour symbol have an anti-vibration carbide shank. (Micro-dex boring bars are carbide shank only.)  
 Note 2) l/d represents the ratio of the projection length L to the cutting edge and the shank diameter d.

	KAPR=94°	KAPR=95°	KAPR=107.5°–117.5°	KAPR=142°	KAPR=3°, 5°	Selection Standard								
						Economical	Low Cutting Resistance (Sharp edge)	Clamp Rigidity	Vibration Resistance	Operation Efficiency	Coolant Hole	Specialized	Small Diameter Cutting	
														
		 CBORS(-B) E021		 CR E022			⊙			⊙*				⊙
	 COFR-BLS E024						⊙							⊙
		 SCLC E018								⊙*				⊙
		 FSWL E029					○			○*				○
		 FSCLC/P E007	 FSDQC E011	 FSVPB/C E013	 FSVJB/C E014		⊙			⊙*	⊙	⊙*		
		 SCLC E032	 SDQC E033	 SVQC E034	 SCZC E036					○*				
							⊙			○				⊙
	 PCLN E038	 PWLN E039	 PDQN E039		 PDZN E040		⊙	○		⊙	⊙			
	 DCLN E015	 DWLN E017												

Note 3) ⊙: 1st recommendation. ○: 2nd recommendation.  
 Note 4) \* Indicates that the shank material is carbide.

# IDENTIFICATION

■ ISO CODES KEY-Boring Tools for Internal Machining

BORING BARS

A	● Tool Holder with Coolant Hole
	● Steel Shank
C	● Carbide Shank
E	● Tool Holder with Coolant Hole
	● Carbide Shank
S	● Steel Shank

08	φ 8	F	80
10	φ 10	H	100
12	φ 12	K	125
16	φ 16	M	150
20	φ 20	Q	180
25	φ 25	R	200
32	φ 32	S	250
40	φ 40	T	300
50	φ 50	U	350
		V	400

① Shank Material
------------------

② Shank Diameter DCON (mm)
----------------------------

③ Tool Length LF (mm)
-----------------------

④ Clamping Method
-------------------

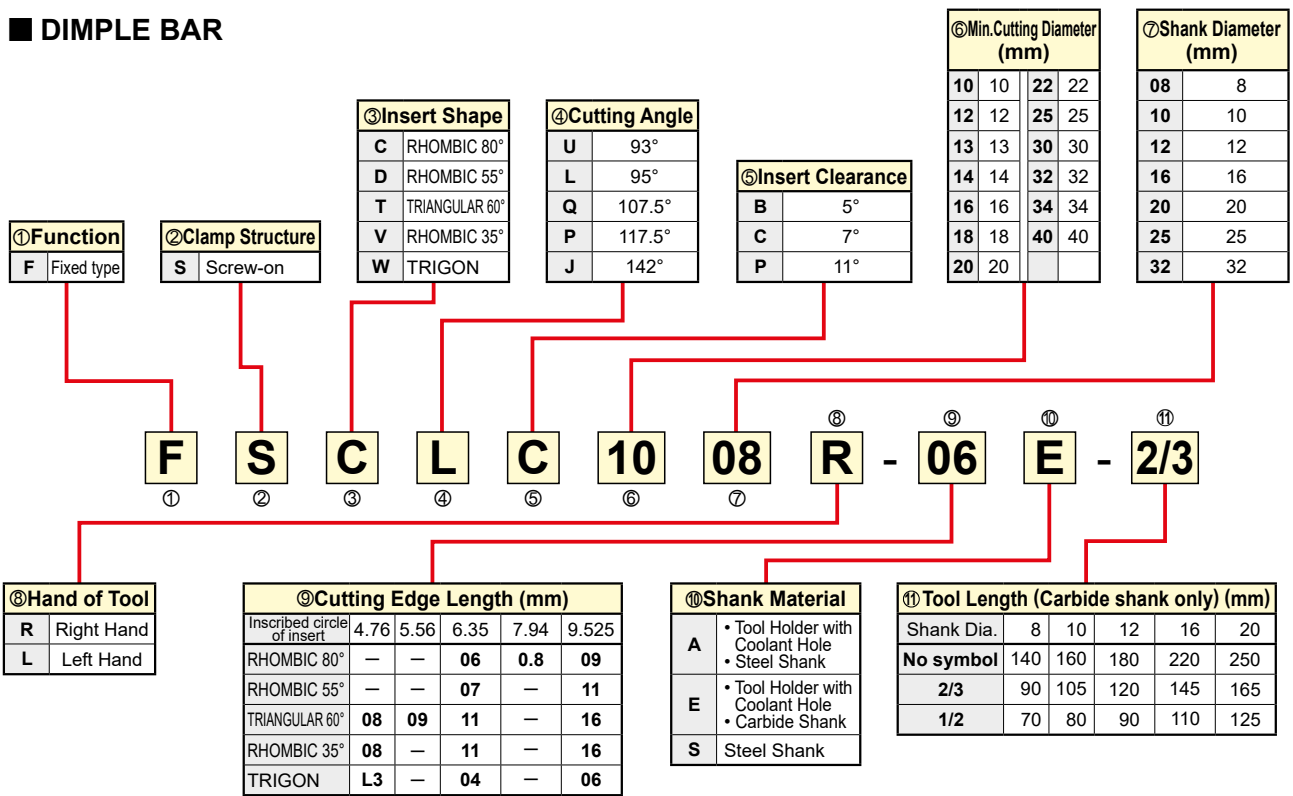
S
16
M
S
C
L
C
R
09

⑤ Insert Shape		⑥ Tool Style		⑦ Insert Normal Clearance		⑨ Insert Size						
C		F		C		Inscribed Circle of Insert (mm)	C	D	S	T	V	W
D		K		E		3.97	—	—	—	—	—	02
S		L		N		4.76	—	—	—	—	—	—
T		Q		P		5.56	—	—	—	09	—	L3
V		U				6.35	06	07	—	11	11	04
W		Z				7.94	08	—	—	—	—	—
						9.525	09	11	09	16	16	06
						12.70	12	15	12	22	—	08
						15.875	16	—	—	—	—	—
						19.05	19	—	19	—	—	—

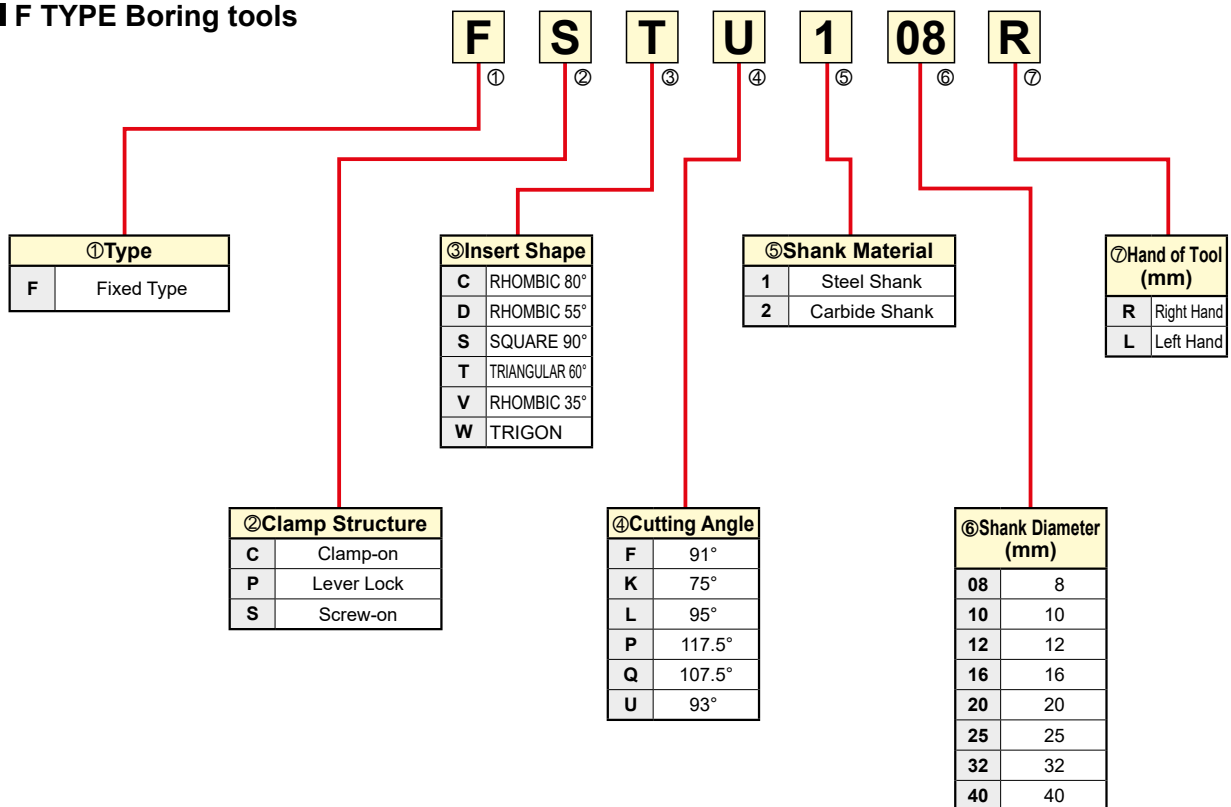
⑧ Hand of Tool

R	
L	

## ■ DIMPLE BAR

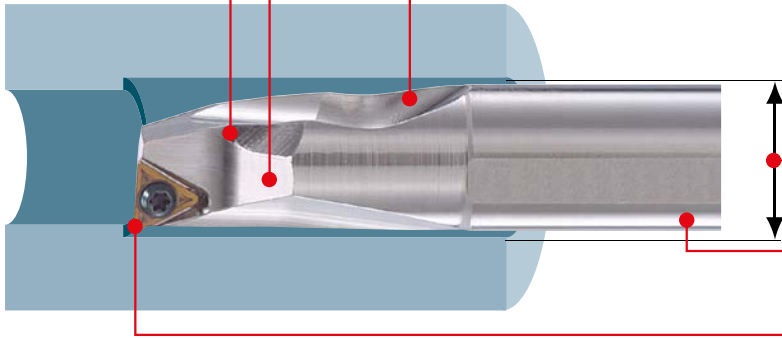


## ■ F TYPE Boring tools



# FEATURES OF DIMPLE BAR

Highly rigid steel shank and a lightweight head configuration. Designed by computer simulation analysis to reduce chatter and improve the vibration damping properties.



Chip disposal is improved by having two channels for chip evacuation.

The lightweight head with its large dimple reduces chatter.

Available in sizes smaller than the ISO standard. Therefore the boring of small diameter holes is possible.

The boring bar has a laser printed scale on the shank to facilitate easy installation.

"F and FS" breakers improve the quality of the surface finish, "MV" breaker offers excellent chip disposal. High wear resistant PCBN inserts are also available for the machining of hardened materials.

E

BORING BARS

## ■ VIBRATION RESISTANCE

### ● DIMPLE BAR

Weight of the Head	Damping Time
49.7g	15.8ms



By reducing the weight of the head, the damping properties are increased.

### ● Conventional Product

Weight of the Head	Damping Time
70.1g	20ms



\* The simulation data stated above was conducted with a FSCLP1816R-09A holder, under the following conditions; l/d=5, depth of cut=0.5mm, and feed=0.05mm/rev.

## ■ How to use CCG/MT•CPG/MT•CPMX•TPG/MX type inserts

By changing the clamp screw, it is possible to use the inserts listed in the table below.

### Holder : FSCLC/P•FSCLC/P...E

Insert Number	Clamp Screw
<b>CCG/MT0602</b> (φ6.35)	Can be used as it is.
<b>CPG/MT0802</b> (φ7.94)	Change to <b>TS3</b>
<b>CPG/MT0903</b> (φ9.525)	Change to <b>TS4</b>
<b>CPMX0802</b> (φ7.94)	Can be used as it is.
<b>CPMX0903</b> (φ9.525)	Can be used as it is.

### Holder : FSTUP•FSTUP...E

Insert Number	Clamp Screw
<b>TPG/MX0802</b> (φ4.76)	Change to <b>CS200T</b>
<b>TPG/MX0902</b> (φ5.56)	Change to <b>CS250T</b>
<b>TPG/MX1103</b> (φ6.35)	Change to <b>CS300890T</b>

\* If the screw is too long the please shorten as necessary.

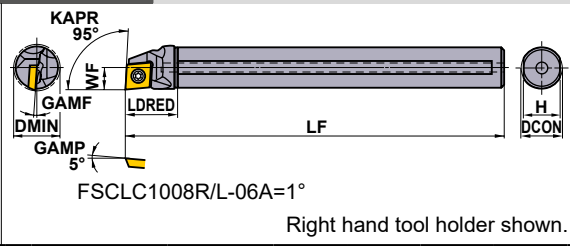
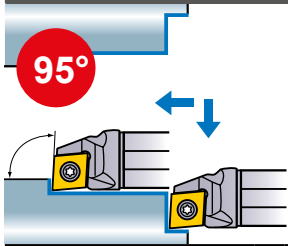
Note 1) TPMT/W09, W11 types cannot be used due to a different clamp screw size.

# DIMPLE BAR

- Excellent vibration resistance due to the light dimple head.
- Chip disposal is improved by having two channels for chip evacuation.
- A laser printed scale on the side for easy installation (Steel shank).
- l/d is 3 to 5 times the diameter (Carbide shank is 3 to 8 times the diameter).

## FSCLC/P

### CC<sup>○</sup> inserts, CP<sup>○</sup> inserts



Finish	Finish	Finish	Light
FP (06)	FV (06,08,09)	FM (06)	SV (06,08,09)
Light	Medium	Medium	PCBN/PCD
LP (06)	MV (06,08,09)	MP (06)	(06,08,09)

Order Number	Coolant Hole	Stock		Insert Number	Dimensions (mm)						Maximum Recommendation l/d Ratio	*1			
		R	L		DCON	LF	LDRED	WF	H	GAMF		DMIN	Clamp Screw	Wrench	
FSCLC1008R/L-06A	○	●	●	CC <sup>○</sup> B/H/T/W	0602 <sup>○</sup>	8	125	18	5	7.2	12°	10	3	TS253	TKY08F
FSCLP1210R/L-08A	○	●	●	CPMB CPMH CPMT*2 CPMX*2 CPGB CPGT*2	0802 <sup>○</sup>	10	150	22.5	6	9	5°	12	3.5	TS3D	TKY10F
FSCLP1210R/L-08S	-	★	★		0802 <sup>○</sup>	10	150	22.5	6	9	5°	12	3.5	TS3D	TKY10F
FSCLP1412R/L-08A	○	●	●		0802 <sup>○</sup>	12	150	27	7	11	4°	14	4	TS3D	TKY10F
FSCLP1816R/L-09A	○	●	●		0903 <sup>○</sup>	16	180	36	9	15	3.5°	18	5	TS4D	TKY15F
FSCLP2220R/L-09A	○	●	●		0903 <sup>○</sup>	20	220	45	11	19	2°	22	5	TS4D	TKY15F
FSCLP2220R-09S	-	★	★		0903 <sup>○</sup>	20	220	45	11	19	2°	22	5	TS4D	TKY15F
FSCLP3025R/L-09A	○	●	●		0903 <sup>○</sup>	25	250	56.3	15	23.4	0°	30	5	TS4D	TKY15F
FSCLP3025R-09S	-	★	★		0903 <sup>○</sup>	25	250	56.3	15	23.4	0°	30	5	TS4D	TKY15F

\*1 Clamp Torque (N • m) : TS253=1.0, TS3D=2.5, TS4D=3.5

\*2 By changing the clamp screw, it is possible to use the different insert. Please refer to page E006.

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

Note 2) When using insert with right and left hand chipbreaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

BORING BARS E

- : Inventory maintained.
- ★ : Inventory maintained in Japan.

CC <sup>○</sup> type inserts	> A139 – A145
CP <sup>○</sup> type inserts	> A146
PCBN & PCD inserts	> B051 – B053, B067

CUTTING CONDITIONS	> E014
SPARE PARTS	> N001
TECHNICAL DATA	> P001

# BORING BARS

## DIMPLE BAR


- Excellent vibration resistance due to the light dimple head.
- Chip disposal is improved by having two channels for chip evacuation.
- A laser printed scale on the side for easy installation (Steel shank).
- l/d is 3 to 5 times the diameter (Carbide shank is 3 to 8 times the diameter).


F

SCLC/P.E



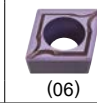





Carbide shank with coolant hole

CC<sup>○</sup> inserts, CP<sup>○</sup> inserts





FSCLC1008R/L-06E (-2/3, -1/2)=1°  
Right hand tool holder shown.

Finish	Finish	Finish	Light
FP  (06)	FV  (06,08,09)	FM  (06)	SV  (06,08,09)
Light	Medium	Medium	PCBN/PCD
LP  (06)	MV  (06,08,09)	MP  (06)	 (06,08,09)

Order Number	Stock		Insert Number	Dimensions (mm)							Maximum Recommendation l/d Ratio	*1		
	R	L		DCON	LF	LDRED	WF	H	GAMF	DMIN		Clamp Screw	Wrench	
FSCLC1008R/L-06E	●	●	CC <sup>○</sup> B	0602 <sup>○</sup>	8	140	13.8	5	7.2	12°	10	7	TS253	TKY08F
FSCLC1008R-06E-2/3	●		CC <sup>○</sup> H	0602 <sup>○</sup>	8	90	13.8	5	7.2	12°	10	5	TS253	TKY08F
FSCLC1008R-06E-1/2	●		CC <sup>○</sup> T	0602 <sup>○</sup>	8	70	13.8	5	7.2	12°	10	3	TS253	TKY08F
FSCLC1008R-06E-1/2	●		CC <sup>○</sup> W	0602 <sup>○</sup>	8	70	13.8	5	7.2	12°	10	3	TS253	TKY08F
FSCLP1210R/L-08E	●	●	CPMB CPMH CPMT *2 CPMX *2 CPGB CPGT *2	0802 <sup>○</sup>	10	160	16.0	6	9	5°	12	7.5	TS3D	TKY10F
FSCLP1210R-08E-2/3	●			0802 <sup>○</sup>	10	105	16.0	6	9	5°	12	5	TS3D	TKY10F
FSCLP1210R-08E-1/2	●			0802 <sup>○</sup>	10	80	16.0	6	9	5°	12	3	TS3D	TKY10F
FSCLP1412R/L-08E	●	●		0802 <sup>○</sup>	12	180	17.8	7	11	4°	14	8	TS3D	TKY10F
FSCLP1412R-08E-2/3	●			0802 <sup>○</sup>	12	120	17.8	7	11	4°	14	5	TS3D	TKY10F
FSCLP1412R-08E-1/2	●			0802 <sup>○</sup>	12	90	17.8	7	11	4°	14	3	TS3D	TKY10F
FSCLP1816R/L-09E	●	●		0903 <sup>○</sup>	16	220	21.8	9	15	3.5°	18	8	TS4D	TKY15F
FSCLP1816R-09E-2/3	●			0903 <sup>○</sup>	16	145	21.8	9	15	3.5°	18	5	TS4D	TKY15F
FSCLP1816R-09E-1/2	●			0903 <sup>○</sup>	16	110	21.8	9	15	3.5°	18	3	TS4D	TKY15F
FSCLP2220R/L-09E	●	●		0903 <sup>○</sup>	20	250	24.0	11	19	2°	22	8	TS4D	TKY15F
FSCLP2220R-09E-2/3	★			0903 <sup>○</sup>	20	165	24.0	11	19	2°	22	5	TS4D	TKY15F
FSCLP2220R-09E-1/2	★			0903 <sup>○</sup>	20	125	24.0	11	19	2°	22	3	TS4D	TKY15F

\*1 Clamp Torque (N · m) : TS253=1.0, TS3D=2.5, TS4D=3.5

\*2 By changing the clamp screw, it is possible to use the different insert. Please refer to page E006.

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

Note 2) Dimensions shown for insert corner RE 0.4. (Model of ☆ Mark is RE 0.8)

Note 3) When using insert with right and left hand chipbreaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

● : Inventory maintained. ★ : Inventory maintained in Japan.

CC <sup>○</sup> type inserts	➤ A139—A145
CP <sup>○</sup> type inserts	➤ A146
PCBN & PCD inserts	➤ B051—B053, B067



# FSTUP

With coolant hole TP $\odot$ inserts

Finish	Light	Medium
FV  (08,09,11,16)	SV  (08,09,11,16)	MV  (08,09,11,16)
PCD	PCBN	
R/L-F  (08,09,11,16)	 (08,09,11,16)	

Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)							Maximum Recommendation l/d Ratio	*1		
	R	L		DCON	LF	LDRED	WF	H	GAMF	DMIN		Clamp Screw	Wrench	
FSTUP1008R/L-08A	●	●	TPMB TPMH TPMX*2 TPGB TPGH TPGX*2	0802 $\odot$	8	125	18	5	7.2	10°	10	3	TS2D	TKY06F
FSTUP1210R/L-09A	●	●		0902 $\odot$	10	150	22.5	6	9	8°	12	3.5	TS25D	TKY08F
FSTUP1412R/L-09A	●	●		0902 $\odot$	12	150	27	7	11	7°	14	4	TS25D	TKY08F
FSTUP1816R/L-11A	●	●		1103 $\odot$	16	180	36	9	15	4°	18	5	TS31D	TKY10F
FSTUP2220R/L-11A	●	●		1103 $\odot$	20	220	45	11	19	0°	22	5	TS31D	TKY10F
FSTUP3225R/L-16A <sup>*</sup>	●	●		1603 $\odot$	25	270	56.3	16	23.4	0°	32	5	TS4D	TKY15F

\*1 Clamp Torque (N · m) : TS2D=0.6, TS25D=1.0, TS31D=2.5, TS4D=3.5

\*2 By changing the clamp screw, it is possible to use the different insert. Please refer to page E006.

# FSTUP\_E

Carbide shank with coolant hole TP $\odot$ inserts

Finish	Light	Medium
FV  (08,09,11)	SV  (08,09,11)	MV  (08,09,11)
PCD	PCBN	
R/L-F  (08,09,11)	 (08,09,11)	

Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)							Maximum Recommendation l/d Ratio	*1		
	R	L		DCON	LF	LDRED	WF	H	GAMF	DMIN		Clamp Screw	Wrench	
FSTUP1008R/L-08E	●	●	TPMB TPMH TPMX*2 TPGB TPGH TPGX*2	0802 $\odot$	8	140	13.8	5	7.2	10°	10	7	TS2D	TKY06F
FSTUP1008R-08E-2/3	●	●		0802 $\odot$	8	90	13.8	5	7.2	10°	10	5	TS2D	TKY06F
FSTUP1008R-08E-1/2	●	●		0802 $\odot$	8	70	13.8	5	7.2	10°	10	3	TS2D	TKY06F
FSTUP1210R/L-09E	●	●		0902 $\odot$	10	160	16.0	6	9	8°	12	7.5	TS25D	TKY08F
FSTUP1210R-09E-2/3	●	●		0902 $\odot$	10	105	16.0	6	9	8°	12	5	TS25D	TKY08F
FSTUP1210R-09E-1/2	●	●		0902 $\odot$	10	80	16.0	6	9	8°	12	3	TS25D	TKY08F
FSTUP1412R/L-09E	●	●		0902 $\odot$	12	180	17.8	7	11	7°	14	8	TS25D	TKY08F
FSTUP1412R-09E-2/3	●	●		0902 $\odot$	12	120	17.8	7	11	7°	14	5	TS25D	TKY08F
FSTUP1412R-09E-1/2	●	●		0902 $\odot$	12	90	17.8	7	11	7°	14	3	TS25D	TKY08F
FSTUP1816R/L-11E	●	●		1103 $\odot$	16	220	21.8	9	15	4°	18	8	TS31D	TKY10F
FSTUP1816R-11E-2/3	●	●		1103 $\odot$	16	145	21.8	9	15	4°	18	5	TS31D	TKY10F
FSTUP1816R-11E-1/2	●	●		1103 $\odot$	16	110	21.8	9	15	4°	18	3	TS31D	TKY10F
FSTUP2220R/L-11E	●	●		1103 $\odot$	20	250	24.0	11	19	0°	22	8	TS31D	TKY10F
FSTUP2220R-11E-2/3	●	●		1103 $\odot$	20	165	24.0	11	19	0°	22	5	TS31D	TKY10F
FSTUP2220R-11E-1/2	●	●		1103 $\odot$	20	125	24.0	11	19	0°	22	3	TS31D	TKY10F

\*1 Clamp Torque (N · m) : TS2D=0.6, TS25D=1.0, TS31D=2.5

\*2 By changing the clamp screw, it is possible to use the different insert. Please refer to page E006.


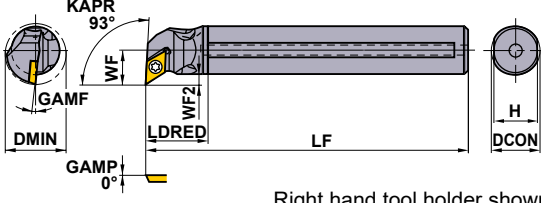






TP $\odot$  type inserts > A162, A163  
PCBN & PCD inserts > B057, B058, B070

CUTTING CONDITIONS > E014  
SPARE PARTS > N001  
TECHNICAL DATA > P001


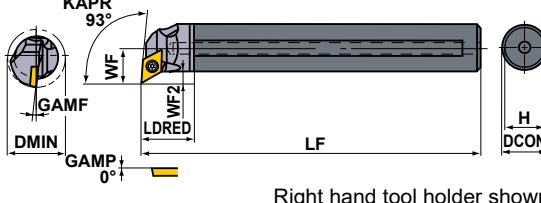






# BORING BARS

## DIMPLE BAR

- Excellent vibration resistance due to the light dimple head.
- Chip disposal is improved by having two channels for chip evacuation.
- A laser printed scale on the side for easy installation (Steel shank).
- l/d is 3 to 5 times the diameter (Carbide shank is 3 to 8 times the diameter).

FSDUC		DC $\odot$ inserts										Finish		Finish		Light		Light			
		Right hand tool holder shown.										FP	FM	LP	LM	Medium	Medium	PCD	PCBN		
																(07,11)	(07,11)	(07,11)	(07,11)		
Order Number	Coolant Hole	Stock	Insert Number		Dimensions (mm)							Maximum Recommendation l/d Ratio	* 								
	R	L			DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN		Clamp Screw	Wrench						
FSDUC1410R/L-07A	○	●	●	DCMT	0702 $\odot$	10	150	18	8.3	3.3	9	7.5°	14	3.5	TS25	TKY08F					
<b>NEW</b> FSDUC1410L-07S	—	★	●	DCMW	0702 $\odot$	10	150	18	8.3	3.3	9	7.5°	14	3.5	TS25	TKY08F					
FSDUC1612R/L-07A	○	●	●	DCGT	0702 $\odot$	12	150	20	9.3	3.3	11	6°	16	4	TS25	TKY08F					
FSDUC2016R/L-07A	○	●	●	DCGW	0702 $\odot$	16	180	20	11.3	3.3	15	5°	20	5	TS25	TKY08F					
FSDUC3220R/L-11A <sup>☆</sup>	○	●	●		11T3 $\odot$	20	180	22.5	16.1	6.1	19	5°	32	5	TS43	TKY15F					

\* Clamp Torque (N · m) : TS25=1.0, TS43=3.5

FSDUC_E		Carbide shank with coolant hole DC $\odot$ inserts										Finish		Finish		Light		Light			
		Right hand tool holder shown.										FP	FM	LP	LM	Medium	Medium	PCD	PCBN		
																(07,11)	(07,11)	(07,11)	(07,11)		
Order Number	Stock	Insert Number		Dimensions (mm)							Maximum Recommendation l/d Ratio	* 									
	R	L			DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN		Clamp Screw	Wrench						
FSDUC1410R/L-07E	●	★	●	DCMT	0702 $\odot$	10	160	16.0	8.3	3.3	9	7.5°	14	7.5	TS25	TKY08F					
FSDUC1612R/L-07E	●	★	●	DCMW	0702 $\odot$	12	180	17.8	9.3	3.3	11	6.0°	16	8	TS25	TKY08F					
FSDUC2016R/L-07E	●	★	●	DCGT	0702 $\odot$	16	220	21.8	11.3	3.3	15	5.0°	20	8	TS25	TKY08F					
FSDUC3220R/L-11E <sup>☆</sup>	●	★	●	DCGW	11T3 $\odot$	20	250	24.0	16.1	6.1	19	5.0°	32	8	TS43	TKY15F					

\* Clamp Torque (N · m) : TS25=1.0, TS43=3.5

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

Note 2) Dimensions shown for insert corner RE 0.4. (Model of ☆ Mark is RE 0.8)

Note 3) When using insert with right and left hand chipbreaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

● : Inventory maintained. ★ : Inventory maintained in Japan.

DC $\odot$  type inserts > A147–A152  
PCBN & PCD inserts > B054, B055, B068

FSDQC			With coolant hole DC $\odot$ inserts									Finish	Finish	Light	Light
			FP	FM	LP	LM									
			(07,11)	(07,11)	(07,11)	(07,11)	Medium	Medium	PCD	PCBN					
			(07,11)	(07,11)	(07,11)	(07,11)	MP	MM	R/L-F						
Order Number	Stock		Insert Number	Dimensions (mm)								Maximum Recommendation l/d Ratio	*		
	R	L		DCON	LF	LDRED	WF	WF2	H	GAMPF	DMIN				
FSDQC1310R/L-07A	●	●	DCMT DCMW DCGT DCGW	0702 $\odot$	10	150	20.5	7.6	2.6	9	8°	13	3.5	TS25	TKY08F
FSDQC1612R/L-07A	●	●		0702 $\odot$	12	150	22.5	8.6	2.6	11	6°	16	4	TS25	TKY08F
FSDQC2016R/L-07A	●	●		0702 $\odot$	16	180	22.5	10.6	2.6	15	5°	20	5	TS25	TKY08F
FSDQC2520R/L-11A <sup>☆</sup>	●	●		11T3 $\odot$	20	180	26	13.7	3.7	19	7°	25	5	TS43	TKY15F

\* Clamp Torque (N · m) : TS25=1.0, TS43=3.5

FSDQC_E			Carbide shank with coolant hole DC $\odot$ inserts									Finish	Finish	Light	Light
			FP	FM	LP	LM									
			(07,11)	(07,11)	(07,11)	(07,11)	Medium	Medium	PCD	PCBN					
			(07,11)	(07,11)	(07,11)	(07,11)	MP	MM	R/L-F						
Order Number	Stock		Insert Number	Dimensions (mm)								Maximum Recommendation l/d Ratio	*		
	R	L		DCON	LF	LDRED	WF	WF2	H	GAMPF	DMIN				
FSDQC1310R/L-07E	●	●	DCMT DCMW DCGT DCGW	0702 $\odot$	10	162	18.4	7.6	2.6	9	8°	13	7.5	TS25	TKY08F
FSDQC1612R/L-07E	●	●		0702 $\odot$	12	182	20.2	8.6	2.6	11	6°	16	8	TS25	TKY08F
FSDQC2016R/L-07E	●	●		0702 $\odot$	16	222	24.2	10.6	2.6	15	5°	20	8	TS25	TKY08F
FSDQC2520R/L-11E <sup>☆</sup>	●	●		11T3 $\odot$	20	254	28.0	13.7	3.7	19	7°	25	8	TS43	TKY15F

\* Clamp Torque (N · m) : TS25=1.0, TS43=3.5

E

BORING BARS

DC $\odot$  type inserts > A147–A152  
PCBN & PCD inserts > B054, B055, B068

CUTTING CONDITIONS > E014  
SPARE PARTS > N001  
TECHNICAL DATA > P001

E011

# BORING BARS

## DIMPLE BAR

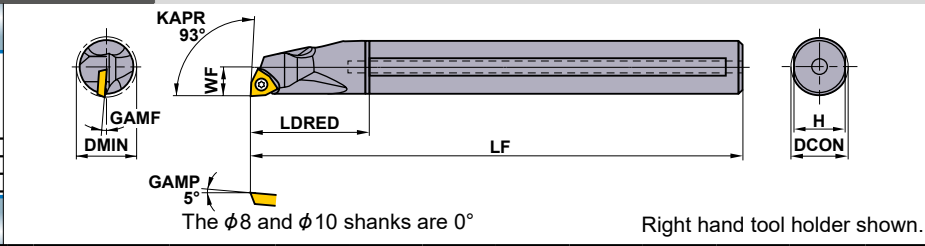
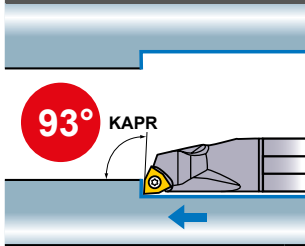
- Excellent vibration resistance due to the light dimple head.
- Chip disposal is improved by having two channels for chip evacuation.
- A laser printed scale on the side for easy installation (Steel shank).
- l/d is 3 to 5 times the diameter (Carbide shank is 3 to 8 times the diameter).

### FSWUB/P

With coolant hole



WB○ inserts, WP○ inserts

Finish  
R/L-F-FS



Medium



Order Number	Stock		Insert Number	Dimensions (mm)							Maximum Recommendation l/d Ratio	*  		
	R	L		DCON	LF	LDRED	WF	H	GAMF	DMIN		Clamp Screw	Wrench	
FSWUB1008R/L-L3A ☆1	●	●	WBMT WBGT	L302○	8	125	18	5	7.2	14°	10	3	TS2	TKY06F
FSWUB1210R/L-L3A ☆1	●	●		L302○	10	150	22.5	6	9	11°	12	3.5	TS2	TKY06F
FSWUP1412R/L-04A	●	●	WPMT WPGT	0402○	12	150	27	7	11	4°	14	4	TS253	TKY08F
FSWUP1816R/L-04A	●	●		0402○	16	180	36	9	15	1°	18	5	TS253	TKY08F
FSWUP2220R/L-06A ☆2	●	●		0603○	20	220	45	11	19	2°	22	5	TS4	TKY15F
FSWUP3025R/L-06A ☆2	●	●		0603○	25	250	56.3	15	23.4	0°	30	5	TS4	TKY15F

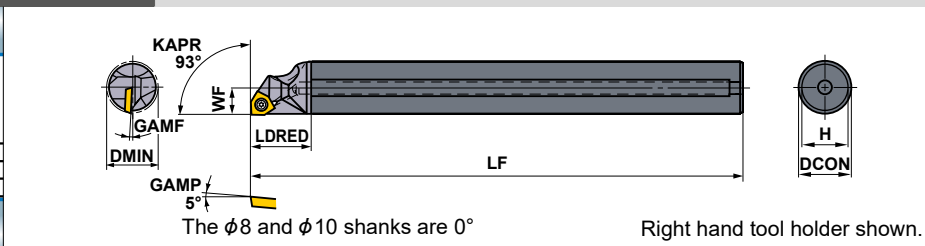
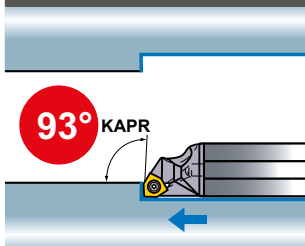
\* Clamp Torque (N · m) : TS2=0.6, TS253=1.0, TS4=3.5

### FSWUB/P\_E

Carbide shank with coolant hole



WB○ inserts, WP○ inserts

Finish  
R/L-F-FS



Medium



Order Number	Stock		Insert Number	Dimensions (mm)							Maximum Recommendation l/d Ratio	*  		
	R	L		DCON	LF	LDRED	WF	H	GAMF	DMIN		Clamp Screw	Wrench	
FSWUB1008R/L-L3E ☆1	★	★	WBMT WBGT	L302○	8	140	13.8	5	7.2	14°	10	7	TS2	TKY06F
FSWUB1008R-L3E-2/3 ☆1	★			L302○	8	90	13.8	5	7.2	14°	10	5	TS2	TKY06F
FSWUB1008R-L3E-1/2 ☆1	★			L302○	8	70	13.8	5	7.2	14°	10	3	TS2	TKY06F
FSWUB1210R/L-L3E ☆1	★	★		L302○	10	160	16.0	6	9	11°	12	7.5	TS2	TKY06F
FSWUB1210R-L3E-2/3 ☆1	★			L302○	10	105	16.0	6	9	11°	12	5	TS2	TKY06F
FSWUB1210R-L3E-1/2 ☆1	★			L302○	10	80	16.0	6	9	11°	12	3	TS2	TKY06F
FSWUP1412R/L-04E	★	★	WPMT WPGT	0402○	12	180	17.8	7	11	4°	14	8	TS253	TKY08F
FSWUP1412R-04E-2/3	★			0402○	12	120	17.8	7	11	4°	14	5	TS253	TKY08F
FSWUP1412R-04E-1/2	★			0402○	12	90	17.8	7	11	4°	14	3	TS253	TKY08F
FSWUP1816R/L-04E	★	★		0402○	16	220	21.8	9	15	1°	18	8	TS253	TKY08F
FSWUP1816R-04E-2/3	★			0402○	16	145	21.8	9	15	1°	18	5	TS253	TKY08F
FSWUP1816R-04E-1/2	★			0402○	16	110	21.8	9	15	1°	18	3	TS253	TKY08F
FSWUP2220R/L-06E ☆2	★	★		0603○	20	250	24.0	11	19	2°	22	8	TS4	TKY15F
FSWUP 2220R-06E-2/3 ☆2	★			0603○	20	165	24.0	11	19	2°	22	5	TS4	TKY15F
FSWUP 2220R-06E-1/2	★			0603○	20	125	24.0	11	19	2°	22	3	TS4	TKY15F

\* Clamp Torque (N · m) : TS2=0.6, TS253=1.0, TS4=3.5

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

Note 2) Dimensions shown for insert corner RE 0.4. (Model of ☆1 Mark is RE 0.2, Model of ☆2 Mark is RE 0.8)

Note 3) When using insert with right and left hand chipbreaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

● : Inventory maintained. ★ : Inventory maintained in Japan.

WB○ type inserts > A172  
WP○ type inserts > A174  
PCD inserts > B072

FSVUB/C		VC $\odot$ inserts, VB $\odot$ inserts										Finish		Finish		Light		Light																				
		Coolant Hole		Stock		Insert Number		Dimensions (mm)										Maximum Recommendation I/d Ratio		Shim		Shim Pin		Clamp Screw *		Wrench												
Order Number		R	L			DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN																									
FSVUC1612R/L-08A	○	●	●	VCGT	0802 $\odot$	12	150	25	11	5.5	11	8°	16	4	—	—	TS202	TKY06F																				
FSVUB2016R/L-11A	○	●	●	VCMT	1103 $\odot$	16	180	32.5	15.5	8	15	8°	20	5	—	—	TS255	TKY08F																				
FSVUB2520R/L-11A	○	●	●	VBMT	1103 $\odot$	20	200	40.5	17.5	8	19	7°	25	5	—	—	TS255	TKY08F																				
FSVUB2520R-11S	—	★		VBMT	1103 $\odot$	20	200	40.5	17.5	8	19	7°	25	5	—	—	TS255	TKY08F																				
FSVUB3425R/L-16A <sup>☆2</sup>	○	●	●	VBMT	1604 $\odot$	25	220	50	20.5	8.5	23.4	13°	34	5	SPSVN32	BCP141	TS35D	TKY15F																				
FSVUB4032R/L-16A <sup>☆2</sup>	○	●	●	VBMT	1604 $\odot$	32	250	84.0	27.5	12	30.4	9°	40	5	SPSVN32	BCP141	TS35D	TKY15F																				

\* Clamp Torque (N · m) : TS202=0.6, TS255=1.0, TS35D=3.5

FSVVPB/C		VC $\odot$ inserts, VB $\odot$ inserts										Finish		Finish		Light		Light																						
		Coolant Hole		Stock		Insert Number		Dimensions (mm)										Maximum Recommendation I/d Ratio		Shim		Shim Pin		Clamp Screw *		Wrench														
Order Number		R	L			DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN																											
FSVPC1610R/L-08A	○	●	●	VCGT	0802 $\odot$	10	150	25	8	3	9	8°	16	3.5	—	—	TS202	TKY06F																						
FSVVPB2012R/L-11A	○	●	●	VCMT	1103 $\odot$	12	150	28	10	4.5	11	8°	20	4	—	—	TS255	TKY08F																						
FSVVPB2516R/L-11A	○	●	●	VBMT	1103 $\odot$	16	180	35	12.5	5	15	5°	25	5	—	—	TS255	TKY08F																						
<b>NEW</b> FSVVPB3020R-11S	—	★		VBMT	1103 $\odot$	20	200	40	15	5	19	5°	30	5	—	—	TS255	TKY08F																						
FSVVPB3425R/L-16A <sup>☆2</sup>	○	●	●	VBMT	1604 $\odot$	25	220	50	17	5	23.4	13°	34	5	SPSVN32	BCP141	TS35D	TKY15F																						
FSVVPB4032R/L-16A <sup>☆2</sup>	○	●	●	VBMT	1604 $\odot$	32	250	55	22	6.5	30.4	9°	40	5	SPSVN32	BCP141	TS35D	TKY15F																						

\* Clamp Torque (N · m) : TS202=0.6, TS255=1.0, TS35D=3.5

VB $\odot$ type inserts	> A164 – A166
VC $\odot$ type inserts	> A167 – A169
PCBN & PCD inserts	> B059, B071

CUTTING CONDITIONS	> E014
SPARE PARTS	> N001
TECHNICAL DATA	> P001

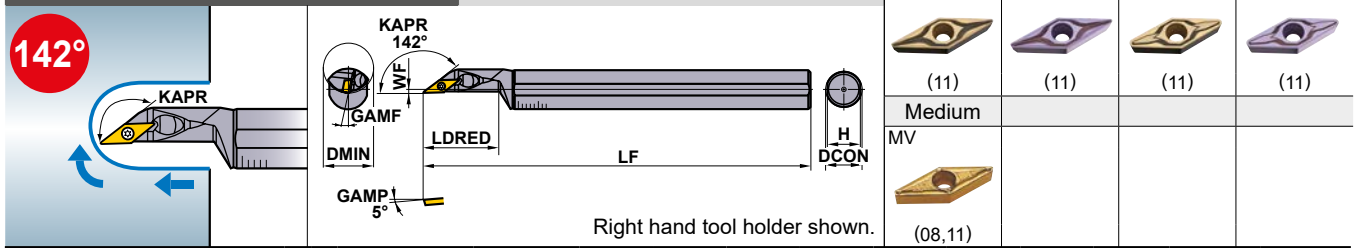
# BORING BARS



## DIMPLE BAR

- Excellent vibration resistance due to the light dimple head.
- Chip disposal is improved by having two channels for chip evacuation.
- A laser printed scale on the side for easy installation (Steel shank).
- l/d is 3 to 5 times the diameter.

### FSVJB/C

### VC $\odot$ inserts, VB $\odot$ inserts



Order Number	Stock		Insert Number	Dimensions (mm)							Maximum Recommendation l/d Ratio	*  		
	R	L		DCON	LF	LDRED	WF	H	GAMP	DMIN		Clamp Screw	Wrench	
FSVJC1612R/L-08S ☆	●	●	VCGT VCMT	0802 $\odot$	12	150	26	2	11	5°	16	4	TS202	TKY06F
FSVJC2016R/L-08S ☆	●	●	VCMT	0802 $\odot$	16	180	36	2	15	5°	20	5	TS202	TKY06F
FSVJB2520R/L-11S ☆	●	●	VBMT VBMW	1103 $\odot$	20	200	37.5	2	19	5°	25	5	TS255	TKY08F
FSVJB3025R/L-11S ☆	●	●	VBET VBGW	1103 $\odot$	25	250	45	3.5	23.4	5°	30	5	TS255	TKY08F

\* Clamp Torque (N · m) : TS202=0.6, TS255=1.0

E

BORING BARS

### RECOMMENDED CUTTING CONDITIONS

Work Material	Properties	Cutting Mode	Chipbreaker	Recom- mendation	Cutting Speed (m/min)	L/D ≤ 3 (Steel shank)		L/D ≤ 4-5 (Steel shank)		
						Feed (mm/rev)	Depth of Cut (mm)	Feed (mm/rev)	Depth of Cut (mm)	
P Mild Steel	≤180HB	Finish	FP	FV	NX2525	170 (120-220)	0.10 (0.05-0.15)	-0.5	0.10 (0.05-0.15)	-0.5
			LP	SV	MP3025	150 (100-200)	0.20 (0.10-0.25)	-1.0	0.15 (0.05-0.20)	-1.0
		Light	LP	SV	NX2525	160 (110-210)	0.20 (0.10-0.25)	-1.0	0.15 (0.05-0.20)	-1.0
			SV	-	NX3035	150 (100-200)	0.20 (0.10-0.25)	-1.0	0.15 (0.05-0.20)	-1.0
		Medium	MP	MV	MP3025	140 (90-190)	0.25 (0.15-0.35)	-2.0	0.20 (0.15-0.25)	-1.5
			MP	MV	NX2525	150 (100-200)	0.25 (0.15-0.35)	-2.0	0.20 (0.15-0.25)	-1.5
Carbon Steel Alloy Steel	180-350HB	Finish	FP	-	MC6115	140 (90-190)	0.10 (0.05-0.15)	-0.5	0.10 (0.05-0.15)	-0.5
			FV	-	VP15TF	140 (90-190)	0.10 (0.05-0.15)	-0.5	0.10 (0.05-0.15)	-0.5
		Light	FP	FV	NX2525	130 (80-180)	0.10 (0.05-0.15)	-0.5	0.10 (0.05-0.15)	-0.5
			LP	SV	MC6125	140 (90-190)	0.20 (0.10-0.25)	-1.0	0.15 (0.05-0.20)	-1.0
		Medium	LP	SV	MP3025	110 (60-160)	0.20 (0.10-0.25)	-1.0	0.15 (0.05-0.20)	-1.0
			SV	-	NX3035	110 (60-160)	0.20 (0.10-0.25)	-1.0	0.15 (0.05-0.20)	-1.0
M Stainless Steel	≤200HB	Finish	MP	MV	MC6125	130 (80-180)	0.25 (0.15-0.35)	-2.0	0.20 (0.15-0.25)	-1.5
			MP	MV	MP3025	100 (60-150)	0.25 (0.15-0.35)	-2.0	0.20 (0.15-0.25)	-1.5
		Light	MV	-	NX3035	100 (60-150)	0.25 (0.15-0.35)	-2.0	0.20 (0.15-0.25)	-1.5
			FM	FV	VP15TF	150 (110-190)	0.10 (0.05-0.15)	-0.5	0.10 (0.05-0.15)	-0.5
		Medium	LM	-	MC7025	125 (85-165)	0.20 (0.10-0.25)	-1.0	0.15 (0.05-0.20)	-1.0
			SV	-	US735	125 (85-165)	0.20 (0.10-0.25)	-1.0	0.15 (0.05-0.20)	-1.0
K Gray Cast Iron	Tensile Strength ≤350MPa	Finish	LM	SV	VP15TF	130 (90-170)	0.20 (0.10-0.25)	-1.0	0.15 (0.05-0.20)	-1.0
			MM	-	MC7025	105 (70-135)	0.20 (0.10-0.25)	-2.0	0.20 (0.15-0.25)	-1.0
		Medium	MV	-	US735	125 (85-165)	0.20 (0.10-0.25)	-1.0	0.15 (0.05-0.20)	-1.0
			MM	MV	VP15TF	120 (80-160)	0.20 (0.10-0.25)	-2.0	0.20 (0.15-0.25)	-1.0
		Finish	F	FS	HTi10	130 (90-160)	0.15 (0.10-0.20)	-0.5	0.15 (0.05-0.20)	-0.5
			MK	-	MC5015	90 (60-120)	0.20 (0.15-0.25)	-2.0	0.20 (0.15-0.25)	-1.5
N Aluminium Alloy	-	Finish	MV	-	VP15TF	90 (60-120)	0.20 (0.10-0.25)	-2.0	0.20 (0.15-0.25)	-1.5
			F	FS	HTi10	300 (200-400)	0.10 (0.05-0.15)	-0.5	0.10 (0.05-0.15)	-0.5
H Hardened Steel	35-65HRC	Finish	Flat Top	-	MD220	200 (150-250)	0.10 (0.05-0.15)	-2.0	0.10 (0.05-0.15)	-1.0
			Flat Top	-	MB8120	100 (80-200)	0.10 (0.05-0.15)	-0.15	0.10 (0.05-0.15)	-0.1

Note 1) When vibrations occur, reduce cutting speed by 30%.

Note 2) The depth of cut needs to be less than the corner diameter when using the FSVJ type.

Note 3) The recommended pressure for the internal coolant is 1MPa.

Note 4) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

Note 5) Dimensions shown for insert corner RE 0.4. (Model of ☆ Mark is RE 0.8)

Note 6) When using insert with right and left hand chipbreaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

● : Inventory maintained. ★ : Inventory maintained in Japan.

VB $\odot$ type inserts	> A164-A166
VC $\odot$ type inserts	> A167-A169
PCBN & PCD inserts	> B059, B071

# DOUBLE CLAMP

# DIMPLE BAR

- Economical negative insert.
- Single action type.
- Excellent vibration resistance due to a light dimple head. (With coolant hole.)
- l/d is 3 to 4 times the diameter.

A○○○-DCLN		With coolant hole		CN○○inserts						Finish	Light	Light	Medium					
				FP				SA	LP	LM	(12)	(12)	(12)	(12)				
				Medium				Medium	Stainless	PCBN/PCD	(12)	(12)	(12)	(12)				
				MP				Standard	MM		(12)	(12)	(12)					
Order Number		Stock		Insert Number		Dimensions (mm)												
		R L				DCON	LF	LDRED	WF	H	GAMF	DMIN						
A25R-DCLNR/L12		●●		CN○○A		25	200	40	17	23	13°	32	LLSCP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
A32S-DCLNR/L12		●●		CN○○G		32	250	50	22	30	13°	40	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
A40T-DCLNR/L12		●●		CN○○M		40	300	63	27	37	10°	50	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

\* Clamp Torque (N · m) : DC0621T=5.0

A○○○-DDUN		With coolant hole		DN○○inserts						Finish	Light	Medium	Medium					
				FP				LP	MP	MH	(15)	(15)	(15)	(15)				
				Medium				Stainless	G Class	PCBN/PCD	(15)	(15)	(15)	(15)				
				Standard				MM	R/L		(15)	(15)	(15)					
Order Number		Stock		Insert Number		Dimensions (mm)												
		R L				DCON	LF	LDRED	WF	H	GAMF	DMIN						
A25R-DDUNR/L15		●★		DN○○A		25	200	40	17	23	13°	35	LLSDP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
A32S-DDUNR/L15		●●		DN○○G		32	250	50	22	30	13°	40	LLSDN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
A40T-DDUNR/L15		●●		DN○○M		40	300	63	27	37	10°	50	LLSDN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

\* Clamp Torque (N · m) : DC0621T=5.0

E

BORING BARS

## RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Cutting Mode	l/d ≤ 3			l/d = 3-4		
			Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
P Carbon Steel Alloy Steel	180-350HB	Medium	110 (80-140)	0.25 (0.1-0.4)	-5.0	110 (80-140)	0.2 (0.1-0.3)	-4.0
M Stainless Steel	≤200HB	Medium	80 (60-100)	0.2 (0.1-0.3)	-4.0	70 (50-100)	0.15 (0.1-0.25)	-3.0
K Gray Cast Iron	Tensile Strength ≤350MPa	Medium	80 (60-100)	0.25 (0.1-0.4)	-5.0	80 (60-100)	0.2 (0.1-0.3)	-4.0

CN○○ type inserts > A098-A104  
 DN○○ type inserts > A105-A111  
 PCBN & PCD inserts > B036-B042, B064

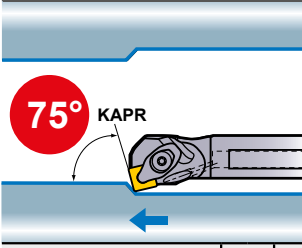
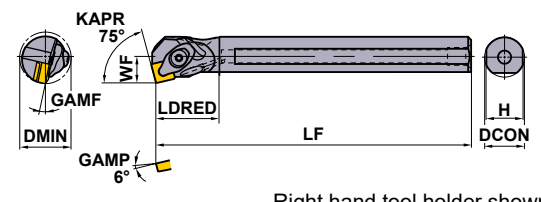
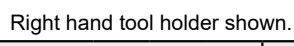
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 TECHNICAL DATA > P001

# BORING BARS

## DOUBLE CLAMP

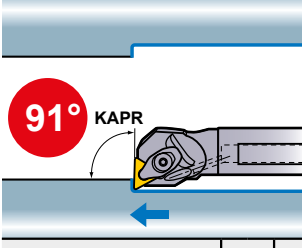
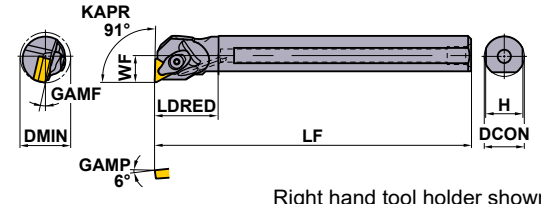
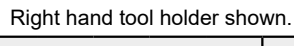
# DIMPLE BAR

- Economical negative insert.
- Single action type.
- Good vibration resistance due to the light dimple head. (With coolant hole)
- l/d is 3 to 4 times the diameter.

A○○○-DSKN		With coolant hole		SN○○inserts		Finish		Light		Medium		Medium				
			FP	LP	MP	MH	(12)	(12)	(12)	(12)	Medium	Stainless	G Class	PCBN/PCD		
															Standard	MM
Order Number	Stock	Insert Number	Dimensions (mm)							Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench	
			DCON	LF	LDRED	WF	H	GAMF	DMIN							
A25R-DSKNR/L12	★ ★	SNMA SNMG SNMM SNGA SNGG	1204○○	25	200	40	17	23	13°	32	LLSSP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
A32S-DSKNR/L12	★ ★	SNMA SNMG SNMM SNGA SNGG	1204○○	32	250	50	22	30	13°	40	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

\* Clamp Torque (N · m) : DC0621T=5.0

BORING BARS

A○○○-DTFN		With coolant hole		TN○○inserts		Finish		Light		Medium		Medium				
			FP	LP	MP	MH	(16)	(16)	(16)	(16)	Medium	Stainless	G Class	PCBN/PCD		
															Standard	MM
Order Number	Stock	Insert Number	Dimensions (mm)							Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench	
			DCON	LF	LDRED	WF	H	GAMF	DMIN							
A25R-DTFNR/L16	● ●	TN○○A TN○○G TN○○M	1604○○	25	200	40	17	23	13°	32	LLSTP32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
A32S-DTFNR/L16	★ ★	TN○○A TN○○G TN○○M	1604○○	32	250	50	22	30	13°	40	LLSTN32	LLP23	DCK2211	DCS2	DC0520T	TKY15F

\* Clamp Torque (N · m) : DC0520T=3.5

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

Note 2) Dimensions shown for insert corner RE 0.8.

Note 3) When using insert with right and left hand chipbreaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

SN○○ type inserts	> A113–A118
TN○○ type inserts	> A119–A125
PCBN & PCD inserts	> B043–B045, B065

● : Inventory maintained. ★ : Inventory maintained in Japan.



A <sup>○</sup> ○ <sup>○</sup> -DVUN With coolant hole VN <sup>○</sup> inserts										Finish	Light	Medium	Medium			
										FP	LP	MP	MH			
										(16)	(16)	(16)	(16)			
										Medium	Stainless	G Class	PCBN/PCD			
										Standard	MM	R/L				
										(16)	(16)	(16)	(16)			
Order Number	Stock	Insert Number	Dimensions (mm)							Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench	
			R	L	DCON	LF	LDRED	WF	H							GAMF
A40T-DVUNR/L16	● ★	VN <sup>○</sup> A VN <sup>○</sup> G VN <sup>○</sup> M	1604 <sup>○</sup>	40	300	63	27	37	9°	50	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F

\* Clamp Torque (N · m) : DC0520T=3.5

A <sup>○</sup> ○ <sup>○</sup> -DWLN With coolant hole WN <sup>○</sup> inserts										Finish	Light	Medium	Medium			
										FP	LP	MP	MK			
										(08)	(06,08)	(06,08)	(08)			
										Medium	Medium-Rough	Stainless				
										Standard	RP	MM				
										(08)	(08)	(06,08)				
Order Number	Stock	Insert Number	Dimensions (mm)							Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench	
			R	L	DCON	LF	LDRED	WF	H							GAMF
A25R-DWLNR/L06	● ★	WNMA WNMG	0604 <sup>○</sup>	25	200	40	17	23	13°	35	LLSWP32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
A25R-DWLNR/L08	● ●	WNMA	0804 <sup>○</sup>	25	200	40	17	23	13°	35	LLSWP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
A32S-DWLNR/L08	● ●	WNMA WNMG	0804 <sup>○</sup>	32	250	50	22	30	13°	40	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
A40T-DWLNR/L08	● ●	WNGA	0804 <sup>○</sup>	40	300	63	27	37	10°	50	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

\* Clamp Torque (N · m) : DC0520T=3.5, DC0621T=5.0

## RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Cutting Mode	l/d ≤ 3			l/d = 3-4		
			Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
P Carbon Steel Alloy Steel	180-350HB	Medium	110 (80-140)	0.25 (0.1-0.4)	-5.0	110 (80-140)	0.2 (0.1-0.3)	-4.0
M Stainless Steel	≤200HB	Medium	80 (60-100)	0.2 (0.1-0.3)	-4.0	70 (50-100)	0.15 (0.1-0.25)	-3.0
K Gray Cast Iron	Tensile Strength ≤350MPa	Medium	80 (60-100)	0.25 (0.1-0.4)	-5.0	80 (60-100)	0.2 (0.1-0.3)	-4.0

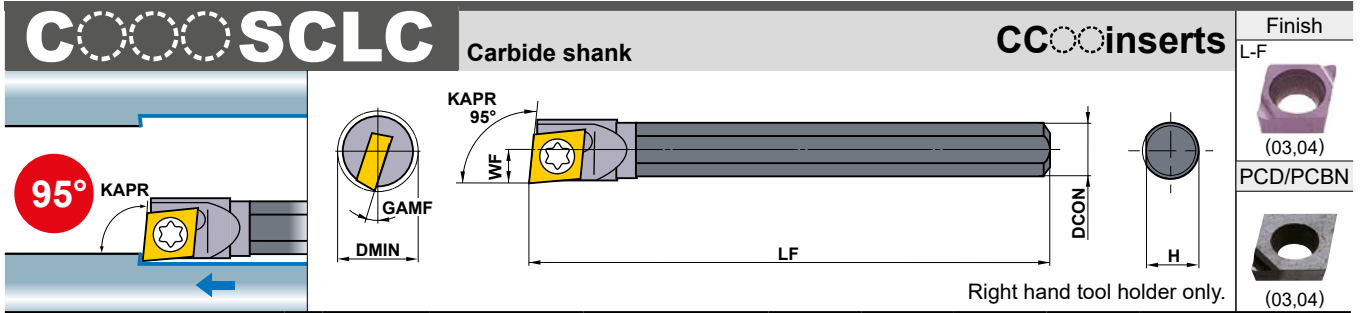
VN<sup>○</sup> type inserts > A126-A129  
 WN<sup>○</sup> type inserts > A130-A134  
 PCBN & PCD inserts > B046-B048, B066

SPARE PARTS > N001  
 TECHNICAL DATA > P001

# BORING BARS

## MICRO-DEX BORING BARS

- The minimum cutting diameter is from  $\phi 5$ . ● l/d is 5 times the diameter.
- 5°, 7° positive insert, carbide shank type.
- Easy-to-use tool geometries.
- Suitable for small workpieces.



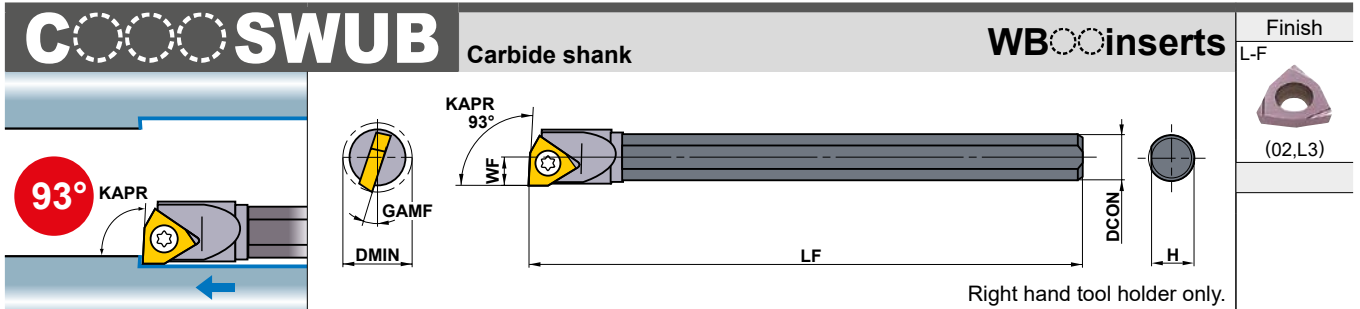
Order Number	Stock R	Insert Number	Dimensions (mm)							*2	
			DCON	LF	WF	H	GAMF	DMIN	Clamp Screw	Wrench	
<b>C04GSCLCR03</b>	●	*1	03S1	4	90	2.5	3.7	15°	5	TS16	TKY06F
<b>C05HSCLCR03</b>	●	CCGT	03S1	5	100	3.0	4.7	13°	6	TS16	TKY06F
<b>C06JSCLCR04</b>	●	CCGW	04T0	6	110	3.5	5.7	13°	7	TS21	TKY08F
<b>C07KSCLCR04</b>	●	CCMW	04T0	7	125	4.0	6.7	11°	8	TS21	TKY08F

\*1 Diameter of inscribed circle is special. (For SCLC type)

\*2 Clamp Torque (N · m) : TS16=0.6, TS21=0.6

E

BORING BARS



Order Number	Stock R	Insert Number	Dimensions (mm)							*	
			DCON	LF	WF	H	GAMF	DMIN	Clamp Screw	Wrench	
<b>C05HSWUBR02</b>	●	WBGT	0201	5	100	3.0	4.7	15°	6	TS21	TKY06F
<b>C06JSWUBR02</b>	●	WBMT	0201	6	110	3.5	5.7	13°	7	TS2C	TKY06F
<b>C07KSWUBRL3</b>	●	L302	0201	7	125	4.0	6.7	15°	8	TS2	TKY06F

\* Clamp Torque (N · m) : TS21=0.6, TS2C=0.6, TS2=0.6

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

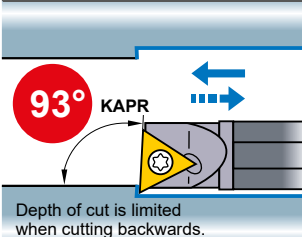
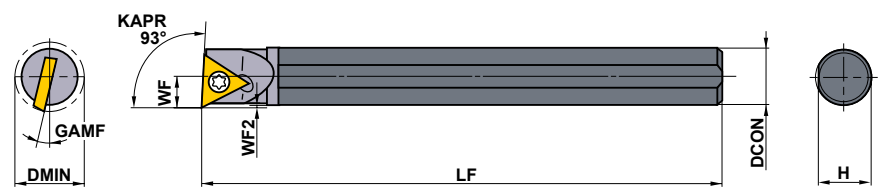


Note 2) Dimensions shown for insert corner RE 0.2.

Note 3) When using insert with right and left hand chipbreaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

● : Inventory maintained.

CC type inserts	> A140
WB type inserts	> A172
PCBN & PCD inserts	> B052, B067

# MICRO-DEX BORING BARS

COSTUC				Carbide shank							TCGT inserts		Finish		
															
														Right hand tool holder only.	
Order Number	Stock	Insert Number		Dimensions (mm)							* 				
				DCON	LF	WF	WF2	H	GAMF	DMIN	Clamp Screw	Wrench			
<b>C07KSTUCR06</b>	●	TCGT	060100L-F	7	125	4.0	0.35	6.7	12°	<b>8</b>	TS2C	TKY06F			

\* Clamp Torque (N • m) : TS2C=0.6

## RECOMMENDED CUTTING CONDITIONS

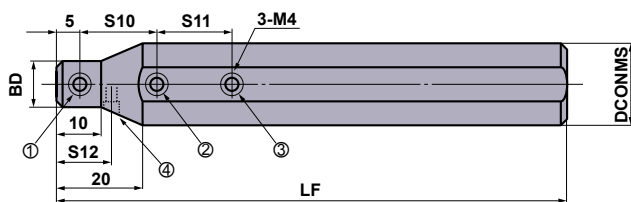
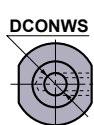
	Work Material	Grade	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	l/d
<b>P</b>	Carbon Steel, Alloy Steel 180–350HB	<b>NX2525</b>	80 (40–120)	0.03 (0.01–0.05)	0.2 (0.1–0.3)	3–5
<b>M</b>	Stainless Steel ≤200HB	<b>VP15TF</b>	80 (40–120)	0.03 (0.01–0.05)	0.2 (0.1–0.3)	3–5
<b>K</b>	Gray Cast Iron ≤350MPa	<b>VP15TF</b>	80 (40–120)	0.03 (0.01–0.05)	0.2 (0.1–0.3)	3–5
<b>N</b>	Non-Ferrous Material	<b>VP15TF</b>	120 (80–160)	0.05 (0.01–0.08)	0.4 (0.1–0.6)	3–5
		<b>MD220</b>	120 (80–160)	0.05 (0.01–0.08)	0.4 (0.1–0.6)	3–5
<b>H</b>	Hardened Steel 35–65HRC	<b>MB8110</b>	80 (40–120)	0.03 (0.01–0.05)	0.1 (0.03–0.2)	3–5

TCGT type inserts > A158  
 SPARE PARTS > N001  
 TECHNICAL DATA > P001

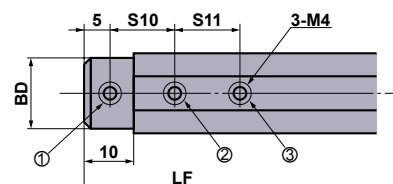
# BORING BARS

## MICRO-DEX BORING BARS

### STANDARD HOLDER



RBH2200N has a temporary set screw for different machine specifications.  
(Represented by number 4)



RBH15800N, RBH1600N,  
RBH19000N

Order Number	Stock	Dimensions (mm)							MICRO-DEX	*1 Clamp Screw				Wrench	Torque (N·m)
		DCONMS	DCONWS	BD	LF	S10	S11	S12		①	②	③	④		
RBH15840N	★	15.875	4	15	100	15	15	—	C04GS	A	A	A	—	HKY20F	2.0
RBH15850N	★	15.875	5	15	100	15	15	—	C05HS	A	A	A	—	HKY20F	2.0
RBH15860N	★	15.875	6	15	100	15	15	—	C06JS	A	A	A	—	HKY20F	2.0
RBH15870N	★	15.875	7	15	100	20	20	—	C07KS	A	A	A	—	HKY20F	2.0
RBH1640N	●	16	4	15	100	15	15	—	C04GS	A	A	A	—	HKY20F	2.0
RBH1650N	●	16	5	15	100	15	15	—	C05HS	A	A	A	—	HKY20F	2.0
RBH1660N	●	16	6	15	100	15	15	—	C06JS	A	A	A	—	HKY20F	2.0
RBH1670N	●	16	7	15	100	20	20	—	C07KS	A	A	A	—	HKY20F	2.0
*2 RBH19040N	★	19.05	4	18	125	15	15	—	C04GS	B	B	B	—	HKY20F	2.0
*2 RBH19050N	★	19.05	5	18	125	15	15	—	C05HS	B	B	B	—	HKY20F	2.0
*2 RBH19060N	★	19.05	6	18	125	15	15	—	C06JS	B	B	B	—	HKY20F	2.0
*2 RBH19070N	★	19.05	7	18	125	20	20	—	C07KS	B	B	B	—	HKY20F	2.0
RBH2040N	★	20	4	13	125	15	15	—	C04GS	A	B	B	—	HKY20F	2.0
RBH2050N	★	20	5	14	125	15	15	—	C05HS	A	B	B	—	HKY20F	2.0
RBH2060N	★	20	6	15	125	15	15	—	C06JS	A	B	B	—	HKY20F	2.0
RBH2070N	★	20	7	16	125	20	20	—	C07KS	A	B	B	—	HKY20F	2.0
RBH2240N	★	22	4	13	125	15	15	12.5	C04GS	A	B	B	A	HKY20F	2.0
RBH2250N	★	22	5	14	125	15	15	12.5	C05HS	A	B	B	A	HKY20F	2.0
RBH2260N	★	22	6	15	125	15	15	15	C06JS	A	B	B	A	HKY20F	2.0
RBH2270N	★	22	7	16	125	20	20	15	C07KS	A	B	B	A	HKY20F	2.0
RBH2540N	★	25	4	13	150	15	15	—	C04GS	A	C	C	—	HKY20F	2.0
RBH2550N	★	25	5	14	150	15	15	—	C05HS	A	C	C	—	HKY20F	2.0
RBH2560N	★	25	6	15	150	15	15	—	C06JS	A	C	C	—	HKY20F	2.0
RBH2570N	★	25	7	16	150	20	20	—	C07KS	A	C	C	—	HKY20F	2.0
RBH25440N	★	25.4	4	13	150	15	15	—	C04GS	A	C	C	—	HKY20F	2.0
RBH25450N	★	25.4	5	14	150	15	15	—	C05HS	A	C	C	—	HKY20F	2.0
RBH25460N	★	25.4	6	15	150	15	15	—	C06JS	A	C	C	—	HKY20F	2.0
RBH25470N	★	25.4	7	16	150	20	20	—	C07KS	A	C	C	—	HKY20F	2.0

\*1 Order number of clamp screw A=HSS04004, B=HSS04006, C=HSS04008

\*2 Revised order number.

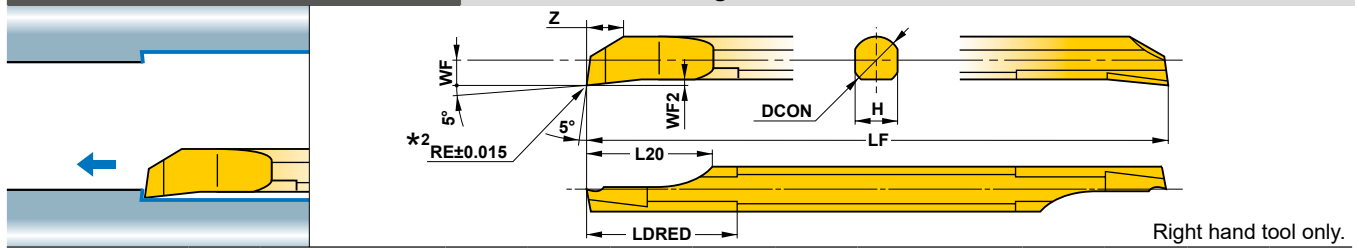
Conventional Order Number	Revised Order Number
RBH1940N	RBH19040N
RBH1950N	RBH19050N
RBH1960N	RBH19060N
RBH1970N	RBH19070N

● : Inventory maintained. ★ : Inventory maintained in Japan.

# MICRO-MINI TWIN

## CB

For internal machining



Order Number	Stock		Breaker	Dimensions (mm)										
	Micro Grain	Coated		DMIN *1		RE	DCON	LF	L20	LDRED	WF	WF2	H	Z
	TF15	VP15TF		l/d ≤ 3	l/d > 3									
CB02RS	●	●	without	2.2	3.6	0.05	2	50	5	6	1	0.25	1.8	1.4
CB02RS-B	●	●	with	2.2	3.9	0.05	2	50	5	6	1	0.25	1.8	1.4
CB02RS-01	●	●	without	2.2	3.6	0.1	2	50	5	6	1	0.25	1.8	1.4
CB02RS-01B	●	●	with	2.2	4.2	0.1	2	50	5	6	1	0.25	1.8	1.4
CB02RS-02	●	●	without	2.2	3.6	0.2	2	50	5	6	1	0.25	1.8	1.4
CB02RS-02B	●	●	with	2.2	4.9	0.2	2	50	5	6	1	0.25	1.8	1.4
CB03RS	●	●	without	3.2	4.2	0.05	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-B	●	●	with	3.2	4.4	0.05	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-01	●	●	without	3.2	4.2	0.1	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-01B	●	●	with	3.2	4.5	0.1	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-02	●	●	without	3.2	4.2	0.2	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-02B	●	●	with	3.2	4.8	0.2	3	50	7.5	9	1.5	0.35	2.7	2.3
CB04RS	●	●	without	4.2	5.1	0.05	4	60	10	12	2	0.45	3.6	3.1
CB04RS-B	●	●	with	4.2	5.2	0.05	4	60	10	12	2	0.45	3.6	3.1
CB04RS-01	●	●	without	4.2	5.1	0.1	4	60	10	12	2	0.45	3.6	3.1
CB04RS-01B	●	●	with	4.2	5.3	0.1	4	60	10	12	2	0.45	3.6	3.1
CB04RS-02	●	●	without	4.2	5.1	0.2	4	60	10	12	2	0.45	3.6	3.1
CB04RS-02B	●	●	with	4.2	5.5	0.2	4	60	10	12	2	0.45	3.6	3.1
CB05RS	●	●	without	5.2	6.0	0.05	5	70	12.5	15	2.5	0.55	4.5	3.9
CB05RS-B	●	●	with	5.2	6.1	0.05	5	70	12.5	15	2.5	0.55	4.5	3.9
CB05RS-02	●	●	without	5.2	6.0	0.2	5	70	12.5	15	2.5	0.55	4.5	3.9
CB05RS-02B	●	●	with	5.2	6.4	0.2	5	70	12.5	15	2.5	0.55	4.5	3.9
CB06RS	●	●	without	6.2	7.2	0.05	6	75	12.5	18	3	0.65	5.4	4.7
CB06RS-B	●	●	with	6.2	7.3	0.05	6	75	12.5	18	3	0.65	5.4	4.7
CB06RS-02	●	●	without	6.2	7.2	0.2	6	75	12.5	18	3	0.65	5.4	4.7
CB06RS-02B	●	●	with	6.2	7.8	0.2	6	75	12.5	18	3	0.65	5.4	4.7
CB07RS	●	●	without	7.2	8.6	0.05	7	85	12.5	21	3.5	0.75	6.3	5.5
CB07RS-B	●	●	with	7.2	8.8	0.05	7	85	12.5	21	3.5	0.75	6.3	5.5
CB07RS-02	●	●	without	7.2	8.6	0.2	7	85	12.5	21	3.5	0.75	6.3	5.5
CB07RS-02B	●	●	with	7.2	9.2	0.2	7	85	12.5	21	3.5	0.75	6.3	5.5
CB08RS	●	●	without	8.2	9.5	0.05	8	95	15	24	4	0.85	7.2	6.3
CB08RS-B	●	●	with	8.2	9.6	0.05	8	95	15	24	4	0.85	7.2	6.3
CB08RS-02	●	●	without	8.2	9.5	0.2	8	95	15	24	4	0.85	7.2	6.3
CB08RS-02B	●	●	with	8.2	9.8	0.2	8	95	15	24	4	0.85	7.2	6.3

\*1 DMIN : Min. Cutting Diameter

\*2 The RE dimension represents the size before grinding a chipbreaker.

## RECOMMENDED CUTTING CONDITIONS

Work Material	Micro-Mini Twin CB				Micro-Mini Twin CR		
	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	l/d	Cutting Speed (m/min)	Feed (mm/rev)	
						03RS/04RS	05RS
<b>P</b> Carbon Steel, Alloy Steel 180-350HB	80 (40-120)	0.03 (0.01-0.05)	0.2 (0.1-0.3)	3-5	80 (40-120)	0.02 (0.01-0.03)	0.03 (0.01-0.05)
<b>M</b> Stainless Steel ≤200HB	80 (40-120)	0.03 (0.01-0.05)	0.2 (0.1-0.3)	3-5	80 (40-120)	0.02 (0.01-0.03)	0.03 (0.01-0.05)
<b>K</b> Gray Cast Iron ≤350MPa	80 (40-120)	0.03 (0.01-0.05)	0.2 (0.1-0.3)	3-5	80 (40-120)	0.03 (0.01-0.05)	0.03 (0.01-0.05)
<b>N</b> Non-Ferrous Material	120 (80-160)	0.05 (0.01-0.08)	0.3 (0.1-0.5)	3-5	120 (80-160)	0.03 (0.01-0.05)	0.05 (0.01-0.08)

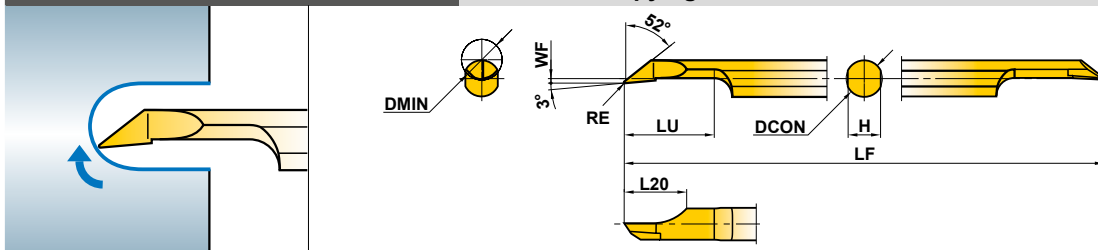
Note 1) Wet machining is recommended.

Note 2) The recommended tool overhang of CR type is LU+2mm.

# MICRO-MINI TWIN

## CR

For internal copying



Right hand tool only.

Order Number	Stock		Breaker	Dimensions (mm)							
	Micro Grain	Coated		DMIN	RE	DCON	LF	LU	L20	WF	H
	TF15	VP15TF									
CR03RS-01	●	●	without	3.5	0.1	3	50	8	6	0.15	2.7
CR03RS-01B	●	●	with	3.5	0.1	3	50	8	6	0.15	2.7
CR04RS-01	●	●	without	4.5	0.1	4	60	10	7	0.15	3.6
CR04RS-01B	●	●	with	4.5	0.1	4	60	10	7	0.15	3.6
CR05RS-01	●	●	without	5.5	0.1	5	70	12	8	0.15	4.5
CR05RS-01B	●	●	with	5.5	0.1	5	70	12	8	0.15	4.5

E

BORING BARS

## RECOMMENDED CUTTING CONDITIONS

Work Material	Micro-Mini Twin CB				Micro-Mini Twin CR		
	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	l/d	Cutting Speed (m/min)	Feed (mm/rev)	
						03RS/04RS	05RS
<b>P</b> Carbon Steel, Alloy Steel 180–350HB	80 (40–120)	0.03 (0.01–0.05)	0.2 (0.1–0.3)	3–5	80 (40–120)	0.02 (0.01–0.03)	0.03 (0.01–0.05)
<b>M</b> Stainless Steel ≤200HB	80 (40–120)	0.03 (0.01–0.05)	0.2 (0.1–0.3)	3–5	80 (40–120)	0.02 (0.01–0.03)	0.03 (0.01–0.05)
<b>K</b> Gray Cast Iron ≤350MPa	80 (40–120)	0.03 (0.01–0.05)	0.2 (0.1–0.3)	3–5	80 (40–120)	0.03 (0.01–0.05)	0.03 (0.01–0.05)
<b>N</b> Non-Ferrous Material	120 (80–160)	0.05 (0.01–0.08)	0.3 (0.1–0.5)	3–5	120 (80–160)	0.03 (0.01–0.05)	0.05 (0.01–0.08)

Note 1) Wet machining is recommended.

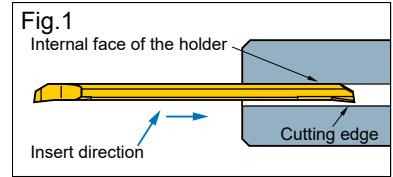
Note 2) The recommended tool overhang of CR type is LU+2mm.

● : Inventory maintained.

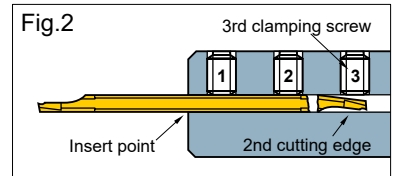
## ■ PRECAUTIONS WHEN USING THE MICRO-MINI TWIN

● When using a holder for general purpose / small automatic lathe:

- ① To avoid chipping of the 2nd cutting edge take care when inserting the boring bar into the holder. Refer to fig.1. If the 2nd edge contacts the internal face of the holder there is a possibility that it may chip.

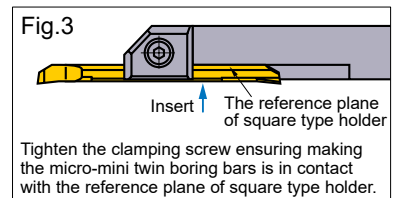


- ② When using this type of holder, there is a possibility that damage to the shank and the 2nd cutting edge can occur. Make sure that the clamping screws are tightened to the set torque value. Additionally make sure that there is no clamping screw near the 2nd cutting edge as this can break the boring bar.



◎ When using Mitsubishi holders

When using holders with a tool overhang of recommended quantity, ensure that the 3rd clamping screw is removed prior to machining. (RBH1620N, RBH19020N, RBH2020N and RBH2520N do not have the 3rd screw.) The set torque value for the clamping screw is 2.0 N·m.



● When using a square type holder:

- ① When installing the boring bar into the holder, tighten the clamp screws after ensuring the flats on the tool holder are parallel to the reference flats on the micro-mini bar. Refer to fig.3.
- ② Make sure that the clamping screws are tightened to the recommended values.
- ③ Do not tighten the clamp screw without a bar in place, otherwise the bridge will be deformed.

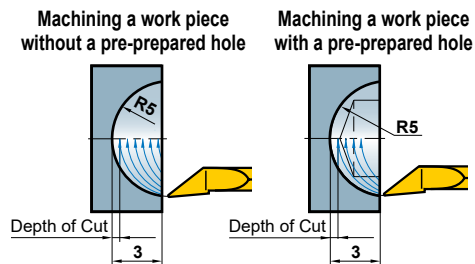
## MACHINING METHODS OF THE CR TYPE

### ● Profile turning

By drilling a pre-prepared hole, the machining time will be shortened and chip control will be improved.

<Cutting Conditions>

Workpiece : DIN S20C  
 Holder : CR05RS-01B  
 Cutting Speed : 80m/min  
 Feed : 0.05mm/rev  
 Depth of Cut : 0.05mm  
 Wet Cutting

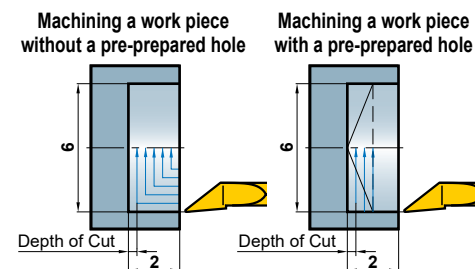


### ● Inner end facing

By drilling a pre-prepared hole, the machining time will be shortened and chip control will be improved.

<Cutting Conditions>

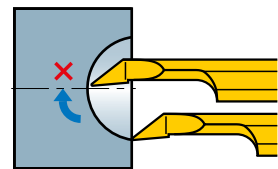
Workpiece : DIN S20C  
 Holder : CR05RS-01B  
 Cutting Speed : 80m/min  
 Feed : 0.05mm/rev  
 Depth of Cut : 0.05mm  
 Wet Cutting



## ■ NOTES FOR USE

### Profile turning, Inner end facing

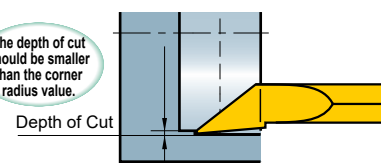
The cutting edge should not be cross the centre line of the work piece.



If the cutting edge crosses the centre line of a work piece, the cutting edge can fracture.

### Copying

The depth of cut should be smaller than the corner radius value.



With depths of cut larger than the corner radius value, burrs will be formed.

# BORING BARS

## MICRO-MINI BORING BARS

- Solid carbide type with minimum cutting diameter  $\phi 3.2\text{mm}$ .
- l/d is 5 times the diameter.
- Cutting edge can be shaped according to the application thus, it covers a wide cutting range (threading, grooving, copying, etc.).

### STANDARD MICRO-MINI BORING BARS (Solid carbide boring bar)

Order Number	Stock TF15	Dimensions (mm)						Geometry
		CW	DCON	LF	LDRED	DMIN	F2	
C03FR-BLS	★	2.0	3	80	15	3.2	1.0	
C04FR-BLS	★	2.5	4	80	20	4.2	1.5	
C05HR-BLS	★	3.0	5	100	25	5.2	2.0	

Right hand tool only.

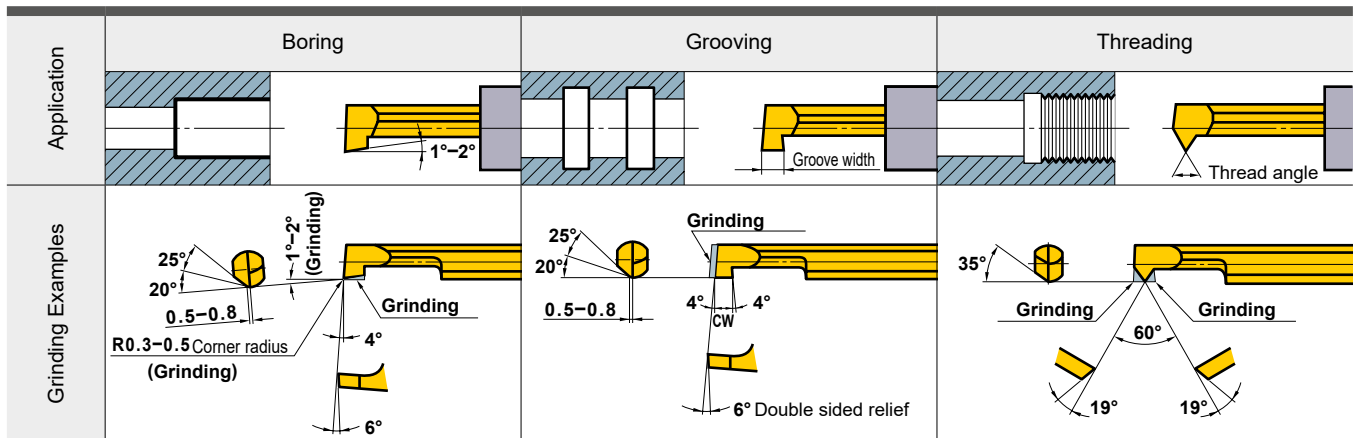
### RECOMMENDED CUTTING CONDITIONS

Work Material	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	l/d	Edge Condition (mm)	
					*Corner Radius or BCH	*Honing
<b>P</b> Carbon Steel, Alloy Steel 180–350HB	40 (30–50)	0.05 (–0.1)	0.2 (0.1–0.3)	5	0.1–0.5	0.01–0.05
<b>M</b> Stainless Steel ≤200HB	40 (30–50)	0.05 (–0.1)	0.2 (0.1–0.3)	5	≤0.4	≤0.03 (Honing not required)
<b>K</b> Gray Cast Iron ≤350MPa	40 (30–50)	0.05 (–0.05)	0.2 (0.1–0.3)	5	0.1–0.5	0.01–0.05
<b>N</b> Non-Ferrous Material	80 (60–100)	0.05 (–0.1)	0.3 (0.1–0.5)	5	0.1–0.5	≤0.03 (Honing not required)

\* Cutting edge is not honed. Please hone according to the workpiece before machining.

### GRINDING THE CUTTING EDGE OF MICRO-MINI BORING BAR

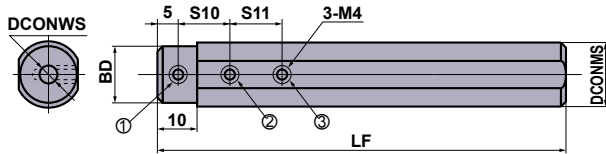
- MICRO-MINI boring bar can be applied to boring and grooving without any modifications. It can also be reground as shown below.
- For shaping and regrinding, use a diamond whetstone approximately #250–#400. Please grind according to the application using the figure below as a reference.



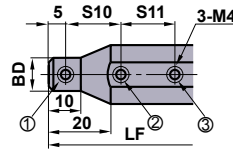
● : Inventory maintained. ★ : Inventory maintained in Japan.



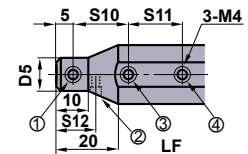
# ROUND TYPE HOLDER



RBH158, RBH16, RBH190



RBH20, RBH25, RBH254



RBH22

Order Number	Stock	Dimensions (mm)							Micro-Mini C	Micro-Mini Twin		*1 Clamp Screw				Wrench	Torque (N·m)
		DCONMS	DCONWS	BD	LF	S10	S11	S12		CB	CR	①	②	③	④		
RBH15820N	★	15.875	2	15	100	10	—	—	02RS(-B) 02RS-0(B)	—	B	B	—	—	HKY20F	2.0	
RBH15830N	★	15.875	3	15	100	10	10	03FR-BLS	03RS(-B) 03RS-0(B)	03RS-01(B)	A	A	A	—	HKY20F	2.0	
RBH15840N	★	15.875	4	15	100	15	15	04FR-BLS	04RS(-B) 04RS-0(B)	04RS-01(B)	A	A	A	—	HKY20F	2.0	
RBH15850N	★	15.875	5	15	100	15	15	05HR-BLS	05RS(-B) 05RS-0(B)	05RS-01(B)	A	A	A	—	HKY20F	2.0	
RBH15860N	★	15.875	6	15	100	15	15	—	06RS(-B) 06RS-0(B)	—	A	A	A	—	HKY20F	2.0	
RBH15870N	★	15.875	7	15	100	20	20	—	07RS(-B) 07RS-0(B)	—	A	A	A	—	HKY20F	2.0	
RBH15880N	★	15.875	8	15	100	20	20	—	08RS(-B) 08RS-0(B)	—	D	D	D	—	HKY20F	2.0	
RBH1620N	●	16	2	15	100	10	—	—	02RS(-B) 02RS-0(B)	—	B	B	—	—	HKY20F	2.0	
RBH1630N	●	16	3	15	100	10	10	03FR-BLS	03RS(-B) 03RS-0(B)	03RS-01(B)	A	A	A	—	HKY20F	2.0	
RBH1640N	●	16	4	15	100	15	15	04FR-BLS	04RS(-B) 04RS-0(B)	04RS-01(B)	A	A	A	—	HKY20F	2.0	
RBH1650N	●	16	5	15	100	15	15	05HR-BLS	05RS(-B) 05RS-0(B)	05RS-01(B)	A	A	A	—	HKY20F	2.0	
RBH1660N	●	16	6	15	100	15	15	—	06RS(-B) 06RS-0(B)	—	A	A	A	—	HKY20F	2.0	
RBH1670N	●	16	7	15	100	20	20	—	07RS(-B) 07RS-0(B)	—	A	A	A	—	HKY20F	2.0	
RBH1680N	★	16	8	15	100	20	20	—	08RS(-B) 08RS-0(B)	—	D	D	D	—	HKY20F	2.0	
*2 RBH19020N	★	19.05	2	18	125	10	—	—	02RS(-B) 02RS-0(B)	—	C	C	—	—	HKY20F	2.0	
*2 RBH19030N	★	19.05	3	18	125	10	10	03FR-BLS	03RS(-B) 03RS-0(B)	03RS-01(B)	B	B	B	—	HKY20F	2.0	
*2 RBH19040N	★	19.05	4	18	125	15	15	04FR-BLS	04RS(-B) 04RS-0(B)	04RS-01(B)	B	B	B	—	HKY20F	2.0	
*2 RBH19050N	★	19.05	5	18	125	15	15	05HR-BLS	05RS(-B) 05RS-0(B)	05RS-01(B)	B	B	B	—	HKY20F	2.0	
*2 RBH19060N	★	19.05	6	18	125	15	15	—	06RS(-B) 06RS-0(B)	—	B	B	B	—	HKY20F	2.0	
*2 RBH19070N	★	19.05	7	18	125	20	20	—	07RS(-B) 07RS-0(B)	—	B	B	B	—	HKY20F	2.0	
RBH19080N	★	19.05	8	18	125	20	20	—	08RS(-B) 08RS-0(B)	—	A	A	A	—	HKY20F	2.0	
RBH2020N	★	20	2	11	125	10	—	—	02RS(-B) 02RS-0(B)	—	A	A	—	—	HKY20F	2.0	
RBH2030N	★	20	3	12	125	10	10	03FR-BLS	03RS(-B) 03RS-0(B)	03RS-01(B)	A	A	B	—	HKY20F	2.0	
RBH2040N	★	20	4	13	125	15	15	04FR-BLS	04RS(-B) 04RS-0(B)	04RS-01(B)	A	B	B	—	HKY20F	2.0	
RBH2050N	★	20	5	14	125	15	15	05HR-BLS	05RS(-B) 05RS-0(B)	05RS-01(B)	A	B	B	—	HKY20F	2.0	
RBH2060N	★	20	6	15	125	15	15	—	06RS(-B) 06RS-0(B)	—	A	B	B	—	HKY20F	2.0	
RBH2070N	★	20	7	16	125	20	20	—	07RS(-B) 07RS-0(B)	—	A	B	B	—	HKY20F	2.0	
RBH2080N	★	20	8	17	125	20	20	—	08RS(-B) 08RS-0(B)	—	A	A	A	—	HKY20F	2.0	
RBH2220N	★	22	2	11	125	10	—	—	02RS(-B) 02RS-0(B)	—	A	B	—	A	HKY20F	2.0	
RBH2230N	★	22	3	12	125	10	10	03FR-BLS	03RS(-B) 03RS-0(B)	03RS-01(B)	A	B	C	A	HKY20F	2.0	
RBH2240N	★	22	4	13	125	15	15	04FR-BLS	04RS(-B) 04RS-0(B)	04RS-01(B)	A	B	B	A	HKY20F	2.0	
RBH2250N	★	22	5	14	125	15	15	05HR-BLS	05RS(-B) 05RS-0(B)	05RS-01(B)	A	B	B	A	HKY20F	2.0	
RBH2260N	★	22	6	15	125	15	15	—	06RS(-B) 06RS-0(B)	—	A	B	B	A	HKY20F	2.0	
RBH2270N	★	22	7	16	125	20	20	—	07RS(-B) 07RS-0(B)	—	A	B	B	A	HKY20F	2.0	
RBH2280N	★	22	8	17	125	20	20	—	08RS(-B) 08RS-0(B)	—	A	B	B	A	HKY20F	2.0	
RBH2520N	★	25	2	11	150	10	—	—	02RS(-B) 02RS-0(B)	—	A	B	—	—	HKY20F	2.0	
RBH2530N	★	25	3	12	150	10	10	03FR-BLS	03RS(-B) 03RS-0(B)	03RS-01(B)	A	B	C	—	HKY20F	2.0	
RBH2540N	★	25	4	13	150	15	15	04FR-BLS	04RS(-B) 04RS-0(B)	04RS-01(B)	A	C	C	—	HKY20F	2.0	
RBH2550N	★	25	5	14	150	15	15	05HR-BLS	05RS(-B) 05RS-0(B)	05RS-01(B)	A	C	C	—	HKY20F	2.0	
RBH2560N	★	25	6	15	150	15	15	—	06RS(-B) 06RS-0(B)	—	A	C	C	—	HKY20F	2.0	
RBH2570N	★	25	7	16	150	20	20	—	07RS(-B) 07RS-0(B)	—	A	C	C	—	HKY20F	2.0	
RBH2580N	★	25	8	17	150	20	20	—	08RS(-B) 08RS-0(B)	—	A	B	B	—	HKY20F	2.0	
RBH25420N	★	25.4	2	11	150	10	—	—	02RS(-B) 02RS-0(B)	—	A	B	—	—	HKY20F	2.0	
RBH25430N	★	25.4	3	12	150	10	10	03FR-BLS	03RS(-B) 03RS-0(B)	03RS-01(B)	A	B	C	—	HKY20F	2.0	
RBH25440N	★	25.4	4	13	150	15	15	04FR-BLS	04RS(-B) 04RS-0(B)	04RS-01(B)	A	C	C	—	HKY20F	2.0	
RBH25450N	★	25.4	5	14	150	15	15	05HR-BLS	05RS(-B) 05RS-0(B)	05RS-01(B)	A	C	C	—	HKY20F	2.0	
RBH25460N	★	25.4	6	15	150	15	15	—	06RS(-B) 06RS-0(B)	—	A	C	C	—	HKY20F	2.0	
RBH25470N	★	25.4	7	16	150	20	20	—	07RS(-B) 07RS-0(B)	—	A	C	C	—	HKY20F	2.0	
RBH25480N	★	25.4	8	17	150	20	20	—	08RS(-B) 08RS-0(B)	—	A	B	B	—	HKY20F	2.0	

\*1 Order number of clamp screw A=HSS04004, B=HSS04006, C=HSS04008, D=HSS04003 \*2 Revised order number.

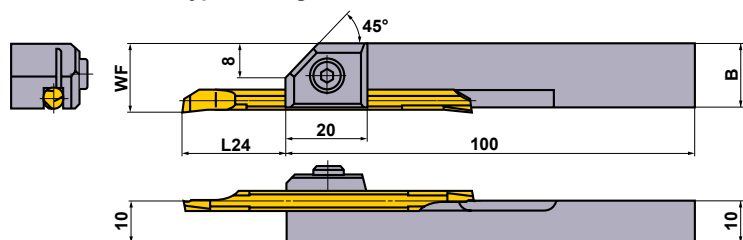
Conventional Order Number	Revised Order Number	Conventional Order Number	Revised Order Number
RBH1920N	RBH19020N	RBH1950N	RBH19050N
RBH1930N	RBH19030N	RBH1960N	RBH19060N
RBH1940N	RBH19040N	RBH1970N	RBH19070N

SPARE PARTS > N001  
TECHNICAL DATA > P001

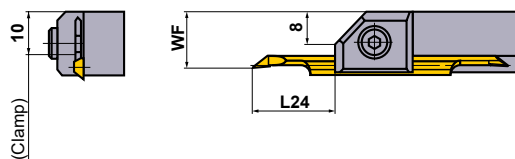
# MICRO-MINI TWIN

**■ SQUARE TYPE HOLDER**

CB type (Boring bar fits in a holder)



CR type (Boring bar fits in a holder)



Order Number	Stock	Dimensions (mm)						Micro-Mini Twin		Clamp Screw	Wrench	Torque (N·m)
		WF		L24 *		B		CB	CR			
		CB	CR	CB	CR	CB	CR					
<b>SBH1020R</b>	★	13	—	6—24 (6—10)	—	12.9	02RS(-B) 02RS-0(B)	—	HSC04010	HKY30R	4.8	
<b>SBH1030R</b>	★	14	12.65	8.5—22 (9—15)	11—19.5 (12)	13.8	03RS(-B) 03RS-0(B)	03RS-01(B)	HSC05012	HKY40R	9.5	
<b>SBH1040R</b>	★	15	13.15	11—29.5 (12—20)	13—27.5 (14)	14.7	04RS(-B) 04RS-0(B)	04RS-01(B)	HSC05012	HKY40R	9.5	
<b>SBH1050R</b>	★	16	13.65	13.5—37 (15—25)	15—35.5 (16)	15.6	05RS(-B) 05RS-0(B)	05RS-01(B)	HSC05012	HKY40R	9.5	
<b>SBH1060R</b>	★	17	—	13.5—42 (18—30)	—	16.5	06RS(-B) 06RS-0(B)	—	HSC05012	HKY40R	9.5	
<b>SBH1070R</b>	★	18	—	13.5—52 (21—35)	—	17.4	07RS(-B) 07RS-0(B)	—	HSC05012	HKY40R	9.5	

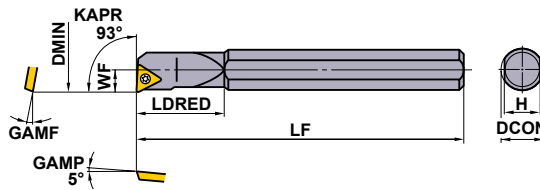
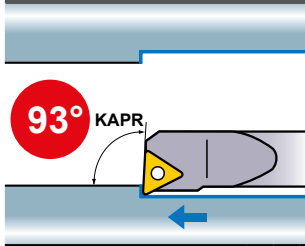
Note 1) The MICRO-DEX and the MICRO-MINI cannot be fit to square holders.

\* L24 is the length of overhang for sufficient clamping, and ( ) is the recommended length for machining of carbon and alloy steel.

# F TYPE BORING BARS

- The minimum cutting diameter is from  $\phi 10$ .
- 11° positive insert.
- Screw-on type.
- l/d is 3 to 5 times the diameter (Carbide shank is 7 times the diameter).

## FSTU1



Right hand tool holder shown.

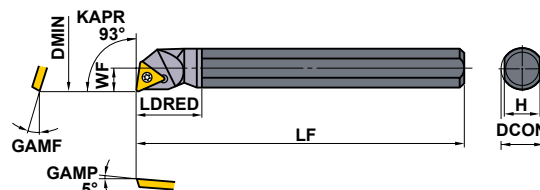
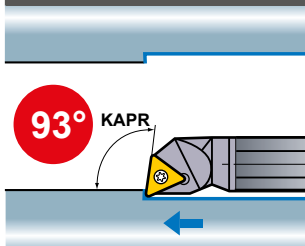
### TP $\odot$ inserts

Light	Flat Top
R/L	
(08,09,11)	(08,09,11)
PCD	PCD
R/L-F	
(09,11)	(08,09,11)

Order Number	Stock		Insert Number	Dimensions (mm)							Tools		
	R	L		DCON	LF	LDRED	WF	H	GAMF	DMIN	Clamp Screw	Wrench	
FSTU108R/L	●	●	TPGX TPMX	0802 $\odot$	8	125	18	5	7	15°	10	CS200T	TKY06F
FSTU110R/L	●	●		0902 $\odot$	10	150	22	6	9	13°	12	CS250T	TKY08F
FSTU112R/L	●	●		0902 $\odot$	12	180	25	8	11	10°	16	CS250T	TKY08F
FSTU116R/L	●	●		1103 $\odot$	16	200	30	11	14	7°	22	CS300890T	TKY08F

\* Clamp Torque (N · m) : CS200T=0.6, CS250T=1.0, CS300890T=1.0

## FSTU2



Right hand tool holder shown.

### Carbide shank

### TP $\odot$ inserts

Light	Flat Top
R/L	
(08,09,11)	(08,09,11)
PCD	PCD
R/L-F	
(09,11)	(08,09,11)

Order Number	Stock		Insert Number	Dimensions (mm)							Tools		
	R	L		DCON	LF	LDRED	WF	H	GAMF	DMIN	Clamp Screw	Wrench	
FSTU208R/L	●	●	TPGX TPMX	0802 $\odot$	8	125	13	5	7	15°	10	CS200T	TKY06F
FSTU210R/L	●	●		0902 $\odot$	10	150	16	6	9	13°	12	CS250T	TKY08F
FSTU212R/L	●	★		0902 $\odot$	12	180	19	8	11	10°	16	CS250T	TKY08F
FSTU216R/L	●	★		1103 $\odot$	16	200	26	11	14	7°	22	CS300890T	TKY08F

\* Clamp Torque (N · m) : CS200T=0.6, CS250T=1.0, CS300890T=1.0

## RECOMMENDED CUTTING CONDITIONS

Steel Shank			l/d ≤ 3			l/d = 3 - 4 (Shank Diameter ≥ 25mm)		
Carbide Shank			l/d ≤ 5			l/d = 6 - 7		
Work Material	Hardness	Cutting Mode	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
P Carbon Steel Alloy Steel	180-350HB	Light Cutting	130 (90-160)	0.1 (0.05-0.15)	0.2	120 (80-150)	0.1 (0.05-0.15)	0.2
		Medium Cutting	90 (60-120)	0.25 (0.15-0.35)	-3.0	80 (50-110)	0.15 (0.1-0.2)	-1.5
M Stainless Steel	≤200HB	Light Cutting	140 (100-180)	0.1 (0.05-0.15)	0.2	140 (100-180)	0.1 (0.05-0.15)	0.2
		Medium Cutting	70 (50-90)	0.2 (0.15-0.25)	-2.0	60 (40-80)	0.15 (0.1-0.2)	-1.0
N Aluminium Alloy	-	Light Cutting	300 (200-400)	0.1 (0.05-0.15)	0.2	300 (200-400)	0.1 (0.05-0.15)	0.2
		Medium Cutting	200 (150-250)	0.1 (0.05-0.15)	-2.0	200 (150-250)	0.1 (0.05-0.15)	-1.5

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

Note 2) Dimensions shown for insert corner RE 0.4.

Note 3) When using insert with right and left hand chipbreaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

TP $\odot$ type inserts	> A162, A163
PCD inserts	> B070
SPARE PARTS	> N001
TECHNICAL DATA	> P001

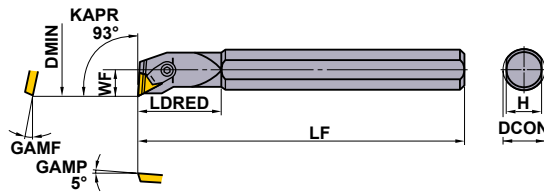
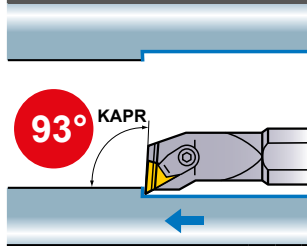
# BORING BARS

## F TYPE BORING BARS

- The minimum cutting diameter is from  $\phi 22$ .
- 11° positive insert.
- Clamp-on type.
- l/d is 3 to 5 times the diameter (Carbide shank is 7 times the diameter).

### FCTU1

#### TP $\odot$ inserts



Right hand tool holder shown.

M Class	M Class	G Class
Standard  (11,16)	 (11,16)	R/L  (11,16)
G Class  (11,16)	PCBN/PCD  (11,16)	

Order Number	Stock		Insert Number	Dimensions (mm)						DMIN	Shim	Shim Pin	Clamp Set*	Breaker Piece	Wrench	
	R	L		DCON	LF	LDRED	WF	H	GAMP							
FCTU116R/L	●	●	TPMN TPMR TPGN TPGR	1103 $\odot$	16	200	30	11	14	7°	22	—	—	C3	CBT2N	HKY25R
FCTU120R/L ☆	●	●		1603 $\odot$	20	200	37	13	18	5°	26	—	—	C4	CBT3F	HKY30R
FCTU125R/L ☆ (4 Side Flat Shank)	●	●		1603 $\odot$	25	250	40	16	22	5°	32	PT32	BCP202	C4	CBT3F	HKY30R
FCTU132R/L ☆ (4 Side Flat Shank)	●	●		1603 $\odot$	32	300	45	20	29	0°	40	PT32	BCP201	C4	CBT3F	HKY30R

\* Clamp Torque (N · m) : C3=2.2, C4=3.3

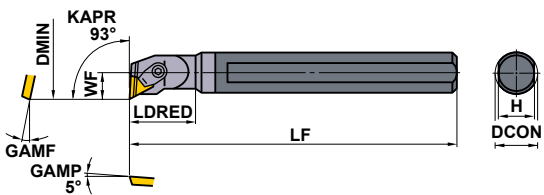
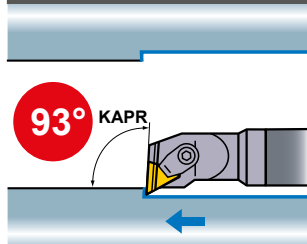
E

BORING BARS

### FCTU2

#### Carbide shank

#### TP $\odot$ inserts



Right hand tool holder only.

M Class	M Class	G Class
 (11,16)	 (11,16)	R/L  (11,16)
G Class  (11,16)	PCBN/PCD  (11,16)	

Order Number	Stock		Insert Number	Dimensions (mm)						DMIN	Shim	Shim Pin	Clamp Set*	Breaker Piece	Wrench	
	R	L		DCON	LF	LDRED	WF	H	GAMP							
FCTU216R	★	★	TPMN TPMR TPGN TPGR	1103 $\odot$	16	200	26	11	14	7°	22	—	—	C3	CBT2N	HKY25R
FCTU220R ☆	★	★		1603 $\odot$	20	200	33	13	18	5°	26	—	—	C4	CBT3F	HKY30R
FCTU225R ☆	★	★		1603 $\odot$	25	250	37	16	22	5°	32	PT32	BCP202	C4	CBT3F	HKY30R

\* Clamp Torque (N · m) : C3=2.2, C4=3.3

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

Note 2) Dimensions shown for insert corner RE 0.4. (Model of ☆ Mark is RE 0.8)

Note 3) When using insert with right and left hand chipbreaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

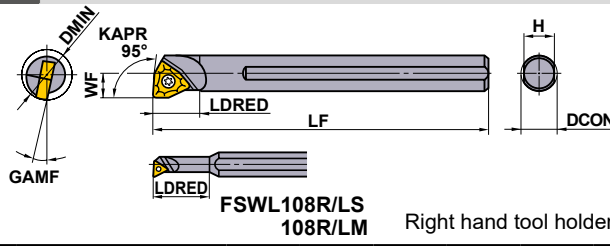
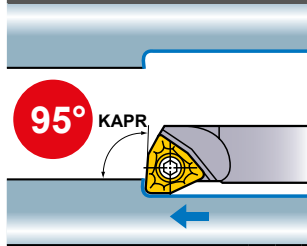
● : Inventory maintained. ★ : Inventory maintained in Japan.

TP $\odot$  type inserts > A180, A181  
PCBN & PCD inserts > B062, B075

# F TYPE BORING BARS

- The minimum cutting diameter is from  $\phi 5.8$ .
- 7° positive insert.
- Screw-on type.
- l/d is 3 to 5 times the diameter (Carbide shank is 7 times the diameter).

## FSWL1



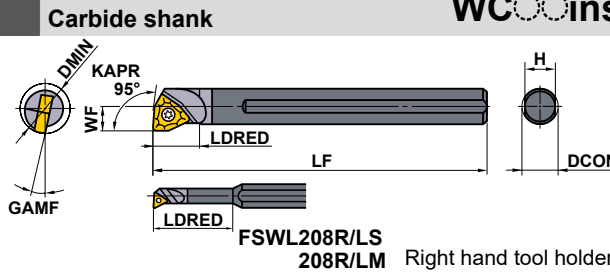
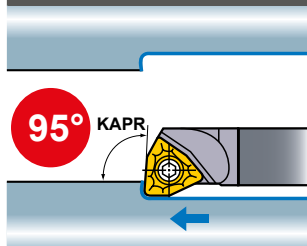
WC $\circ$ inserts

Finish	Light
R/L  (02,L3)	Standard  (02,L3,04,06)
PCBN/PCD  (L3,04,06)	

Order Number	Stock		Insert Number	Dimensions (mm)							*  Clamp Screw	 Wrench	
	R	L		DCON	LF	LDRED	WF	H	GAMF	DMIN			
FSWL108R/LS	●	●	WCMT WCGT	0201 $\circ$	8	100	19	2.9	7	17°	5.8	TS21	TKY06F
FSWL108R/LM	●	●	WCMT WCGT WCMW	L302 $\circ$	8	100	25	4	7	15°	8	TS2	TKY06F
FSWL108R/L	●	●	WCMT WCMW	0402 $\circ$	8	125	10	5	7	15°	10	TS25	TKY08F
FSWL110R/L	●	●		0402 $\circ$	10	150	12	6	9	13°	12	TS25	TKY08F
FSWL112R/L ☆	●	●		06T3 $\circ$	12	180	15	8	11	13°	16	TS4	TKY15F
FSWL116R/L ☆	●	●		06T3 $\circ$	16	200	20	11	14	7°	22	TS4	TKY15F

\* Clamp Torque (N · m) : TS21=0.6, TS2=0.6, TS25=1.0, TS4=3.5

## FSWL2



Carbide shank

WC $\circ$ inserts

Finish	Light
R/L  (02,L3)	Standard  (02,L3,04,06)
PCBN/PCD  (L3,04,06)	

Order Number	Stock		Insert Number	Dimensions (mm)							*  Clamp Screw	 Wrench	
	R	L		DCON	LF	LDRED	WF	H	GAMF	DMIN			
FSWL208R/LS	●	●	WCMT WCGT	0201 $\circ$	8	122	25	2.9	7	17°	5.8	TS21	TKY06F
FSWL208R/LM	●	●	WCMT WCGT WCMW	L302 $\circ$	8	125	33	4	7	15°	8	TS2	TKY06F
FSWL208R/L	●	●	WCMT WCMW	0402 $\circ$	8	125	10	5	7	15°	10	TS25	TKY08F
FSWL210R/L	●	●		0402 $\circ$	10	150	12	6	9	13°	12	TS25	TKY08F
FSWL212R/L ☆	●	●		06T3 $\circ$	12	180	15	8	11	13°	16	TS4	TKY15F
FSWL216R/L ☆	●	●		06T3 $\circ$	16	200	20	11	14	7°	22	TS4	TKY15F

\* Clamp Torque (N · m) : TS21=0.6, TS2=0.6, TS25=1.0, TS4=3.5

## RECOMMENDED CUTTING CONDITIONS

Steel Shank			l/d ≤ 3			l/d = 3 - 4 (Shank Diameter ≥ 25mm)		
Carbide Shank			l/d ≤ 5			l/d = 6 - 7		
Work Material	Hardness	Cutting Mode	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
P Carbon Steel Alloy Steel	180-350HB	Light Cutting	130 (90-160)	0.1 (0.05-0.15)	0.2	120 (80-150)	0.1 (0.05-0.15)	0.2
		Medium Cutting	90 (60-120)	0.25 (0.15-0.35)	-3.0	80 (50-110)	0.15 (0.1-0.2)	-1.5
M Stainless Steel	≤200HB	Light Cutting	140 (100-180)	0.1 (0.05-0.15)	0.2	140 (100-180)	0.1 (0.05-0.15)	0.2
		Medium Cutting	70 (50-90)	0.2 (0.15-0.25)	-2.0	60 (40-80)	0.15 (0.1-0.2)	-1.0
N Aluminium Alloy	-	Light Cutting	300 (200-400)	0.1 (0.05-0.15)	0.2	300 (200-400)	0.1 (0.05-0.15)	0.2
		Medium Cutting	200 (150-250)	0.1 (0.05-0.15)	-2.0	200 (150-250)	0.1 (0.05-0.15)	-1.5



WC $\circ$  type inserts > A173  
PCBN & PCD inserts > B060, B072

SPARE PARTS > N001  
TECHNICAL DATA > P001



# BORING BARS

## S TYPE BORING BARS

- The minimum cutting diameter is from  $\phi 11$ .
- ISO standard.
- 7° positive insert.
- Screw-on type.
- l/d is 3 to 5 times the diameter (Carbide shank is 7 times the diameter).

S		STFC		TC inserts						Finish	Finish	Light	Light
				Right hand tool holder shown.						FP	FM	LP	LM
										(09,11,16)	(09,11,16)	(09,11,16)	(09,11,16)
										Medium	Medium	Flat Top	PCBN/PCD
										MP	MM		
										(09,11,16)	(09,11,16)	(11,16)	(09,11,16)
Order Number	Stock		Insert Number	Dimensions (mm)							*  		
	R	L		DCON	LF	LDRED	WF	H	GAMF	DMIN	Clamp Screw	Wrench	
S08FSTFCR/L09	●	●	TCMT TCGW	0902	8	80	12	6	7	15°	11	TS22	TKY06F
S10HSTFCR/L11	●	●	TCMW TCMT TCGW TCGT	1102	10	100	16	7	9	13°	13	TS25	TKY08F
S12KSTFCR/L11	●	●		1102	12	125	20	9	11	10°	16	TS25	TKY08F
S16MSTFCR/L11	●	●		1102	16	150	25	11	14	7°	20	TS25	TKY08F
S20QSTFCR/L16	☆	●		16T3	20	180	32	13	18	7°	25	TS4	TKY15F
S25RSTFCR/L16	☆	●		16T3	25	200	40	17	23	5°	32	TS4	TKY15F
S32SSTFCR/L16	☆	●		16T3	32	250	50	22	30	5°	40	TS4	TKY15F

\* Clamp Torque (N · m) : TS22=0.6, TS25=1.0, TS4=3.5

C		STFC		Carbide shank TC inserts						Finish	Finish	Light	Light
				Right hand tool holder only.						FP	FM	LP	LM
										(09,11,16)	(09,11,16)	(09,11,16)	(09,11,16)
										Medium	Medium	Flat Top	PCBN/PCD
										MP	MM		
										(09,11,16)	(09,11,16)	(11,16)	(11)
Order Number	Stock		Insert Number	Dimensions (mm)							*  		
	R	L		DCON	LF	LDRED	WF	H	GAMF	DMIN	Clamp Screw	Wrench	
C08HSTFCR09	●	●	TCMT TCGW	0902	8	100	12	6	7	15°	11	TS22	TKY06F
C10KSTFCR11	●	●	TCMW TCMT TCGW TCGT	1102	10	125	16	7	9	13°	13	TS25	TKY08F
C12MSTFCR11	●	●		1102	12	150	20	9	11	10°	16	TS25	TKY08F
C16RSTFCR11	●	●		1102	16	200	25	11	14	7°	20	TS25	TKY08F
C20SSTFCR16	☆	●		16T3	20	250	32	13	18	7°	25	TS4	TKY15F
C25TSTFCR16	☆	●		16T3	25	300	40	17	23	5°	32	TS4	TKY15F

\* Clamp Torque (N · m) : TS22=0.6, TS25=1.0, TS4=3.5

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

Note 2) Dimensions shown for insert corner RE 0.4. (Model of ☆ Mark is RE 0.8)

Note 3) When using insert with right and left hand chipbreaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

E

BORING BARS

● : Inventory maintained.

TC type inserts > A158—A160  
PCBN & PCD inserts > B059, B069

SDUC			DC inserts								Finish	Finish	Light	Light
			<p>Right hand tool holder shown.</p>								FP	FM	LP	LM
											(07,11)	(07,11)	(07,11)	(07,11)
											Medium	Medium	Medium	Flat Top
											MP	MM	Standard	
											(07,11,15)	(07,11,15)	(07,11,15)	(07,11,15)
Order Number	Stock		Insert Number	Dimensions (mm)								*		
	R	L		DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Clamp Screw	Wrench	
S10HSDUCR/L07	●	●	DCMT DCET DCGT DCMW DCGW	0702	10	100	16	7	2.4	9	13°	13	TS25	TKY08F
S12KSDUCR/L07	●	●		0702	12	125	20	9	3.4	11	10°	16	TS25	TKY08F
S16MSDUCR/L07	●	●		0702	16	150	25	11	3.9	14	7°	20	TS25	TKY08F
S20QSDUCR/L11	☆	●		11T3	20	180	32	13	4.4	18	7°	25	TS4	TKY15F
S25RSDUCR/L15	☆	●		1504	25	200	40	17	6.9	23	5°	32	TS5	TKY25F
S32SSDUCR/L15	☆	●		1504	32	250	50	22	8.4	30	5°	40	TS5	TKY25F
S40TSDUCR/L15	☆	●	1504	40	300	63	27	9.4	37	5°	50	TS5	TKY25F	

\* Clamp Torque (N · m) : TS25=1.0, TS4=3.5, TS5=7.5

CSDUC			Carbide shank DC inserts								Finish	Finish	Light	Light
			<p>Right hand tool holder only.</p>								FP	FM	LP	LM
											(07,11)	(07,11)	(07,11)	(07,11)
											Medium	Medium	Medium	Flat Top
											MP	MM	Standard	
											(07,11,15)	(07,11,15)	(07,11,15)	(07,11,15)
Order Number	Stock		Insert Number	Dimensions (mm)								*		
	R	L		DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Clamp Screw	Wrench	
C10KSDUCR07	●		DCMT DCET DCGT DCMW DCGW	0702	10	125	16	7	2.1	9	13°	13	TS25	TKY08F
C12MSDUCR07	●			0702	12	150	20	9	3.1	11	10°	16	TS25	TKY08F
C16RSDUCR07	●			0702	16	200	25	11	3.1	14	7°	20	TS25	TKY08F
C20SSDUCR11	☆	●		11T3	20	250	32	13	3.1	18	7°	25	TS4	TKY15F
C25TSDUCR15	☆	●		1504	25	300	40	17	4.9	23	5°	32	TS5	TKY25F

\* Clamp Torque (N · m) : TS25=1.0, TS4=3.5, TS5=7.5

## RECOMMENDED CUTTING CONDITIONS

Steel Shank			l/d ≤ 3			l/d = 3-4 (Shank Diameter ≥ 25mm)		
Carbide Shank			l/d ≤ 5			l/d = 6-7		
Work Material	Hardness	Cutting Mode	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
P Carbon Steel Alloy Steel	180-350HB	Light Cutting	130 (90-160)	0.1 (0.05-0.15)	0.2	120 (80-150)	0.1 (0.05-0.15)	0.2
		Medium Cutting	90 (60-120)	0.25 (0.15-0.35)	-3.0	80 (50-110)	0.15 (0.1-0.2)	-1.5
M Stainless Steel	≤200HB	Light Cutting	140 (100-180)	0.1 (0.05-0.15)	0.2	140 (100-180)	0.1 (0.05-0.15)	0.2
		Medium Cutting	70 (50-90)	0.2 (0.15-0.25)	-2.0	60 (40-80)	0.15 (0.1-0.2)	-1.0
N Aluminium Alloy	-	Light Cutting	300 (200-400)	0.1 (0.05-0.15)	0.2	300 (200-400)	0.1 (0.05-0.15)	0.2
		Medium Cutting	200 (150-250)	0.1 (0.05-0.15)	-2.0	200 (150-250)	0.1 (0.05-0.15)	-1.5

DC type inserts > A147-A152  
PCBN & PCD inserts > B055, B055, B068

SPARE PARTS > N001  
TECHNICAL DATA > P001

# BORING BARS

## S TYPE BORING BARS

- The minimum cutting diameter is from  $\phi 11$ .
- ISO standard.
- 7° positive insert.
- Screw-on type.
- l/d is 3 to 5 times the diameter (Carbide shank is 7 times the diameter).

S		SCLC		CC inserts							Finish	Finish	Light	Light
									FP (06,09)	FM (06,09)	LP (06,09)	LM (06,09)		
		Right hand tool holder shown.							Medium MP (06,09,12)	Medium MM (06,09,12)	Flat Top (06,09,12)	PCBN/PCD (06,09,12)		
Order Number	Stock		Insert Number	Dimensions (mm)							*			
	R	L		DCON	LF	LDRED	WF	H	GAMF	DMIN	Clamp Screw	Wrench		
S08FSCLCR/L06	●	●	0602	8	80	12	6	7	15°	11	TS25	TKY08F		
S10HSCLCR/L06	●	●	CCMB CCMH	10	100	16	7	9	13°	13	TS25	TKY08F		
S12KSCLCR/L06	●	●	CCMT	12	125	20	9	11	10°	16	TS25	TKY08F		
S16MSCLCR/L09	☆	●	CCMW	16	150	25	11	14	7°	20	TS4	TKY15F		
S20QSCLCR/L09	☆	●	CCET	20	180	32	13	18	7°	25	TS4	TKY15F		
S25RSCLCR/L12	☆	●	CCGH CCGT	25	200	40	17	23	5°	32	TS5	TKY25F		
S32SSCLCR/L12	☆	●	CCGW	32	250	50	22	30	5°	40	TS5	TKY25F		
S40TSCLCR/L12	☆	●		40	300	63	27	37	5°	50	TS5	TKY25F		

\* Clamp Torque (N · m) : TS25=1.0, TS4=3.5, TS5=7.5

C		SCLC		Carbide shank CC inserts							Finish	Finish	Light	Light
									FP (06,09)	FM (06,09)	LP (06,09)	LM (06,09)		
		Right hand tool holder only.							Medium MP (06,09)	Medium MM (06,09)	Flat Top (06,09)	PCBN/PCD (06,09)		
Order Number	Stock		Insert Number	Dimensions (mm)							*			
	R	L		DCON	LF	LDRED	WF	H	GAMF	DMIN	Clamp Screw	Wrench		
C08HSCLCR06	●	●	CCMB CCMH	8	100	12	6	7	15°	11	TS25	TKY08F		
C10KSCLCR06	●	●	CCMT	10	125	16	7	9	13°	13	TS25	TKY08F		
C12MSCLCR06	●	●	CCMW	12	150	20	9	11	10°	16	TS25	TKY08F		
C16RSCLCR09	☆	●	CCET	16	200	25	11	14	7°	20	TS4	TKY15F		
C20SSCLCR09	☆	●	CCGH CCGT CCGW	20	250	32	13	18	7°	25	TS4	TKY15F		

\* Clamp Torque (N · m) : TS25=1.0, TS4=3.5

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

Note 2) Dimensions shown for insert corner RE 0.4. (Model of ☆ Mark is RE 0.8)

Note 3) When using insert with right and left hand chipbreaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

● : Inventory maintained. ☆ : Inventory maintained in Japan.

CC type inserts > A139—A145  
PCBN & PCD inserts > B051—B052, B067



S <sub>0</sub> 00SDQC			DC <sub>0</sub> inserts									Finish	Finish	Light	Light
												FP	FM	LP	LM
												(07,11)	(07,11)	(07,11)	(07,11)
												Medium	Medium	Flat Top	PCBN/PCD
												MP	MM		
Order Number	Stock		Insert Number	Dimensions (mm)								*			
	R	L		DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Clamp Screw	Wrench		
S10HSDQCR/L07	●	●	DCMT DCET DCGT DCMW DCGW	0702 <sub>00</sub>	10	100	16	7	2.4	9	13°	13	TS25	TKY08F	
S12KSDQCR/L07	●	●		0702 <sub>00</sub>	12	125	20	9	3.4	11	10°	16	TS25	TKY08F	
S16MSDQCR/L07	●	●		0702 <sub>00</sub>	16	150	25	11	3.9	14	7°	20	TS25	TKY08F	
S20QSDQCR/L11	☆	●		11T3 <sub>00</sub>	20	180	32	13	4.4	18	7°	25	TS4	TKY15F	
S25RSDQCR/L15	☆	●		1504 <sub>00</sub>	25	200	40	17	6.9	23	5°	32	TS5	TKY25F	
S32SSDQCR15	☆	●		1504 <sub>00</sub>	32	250	50	22	8.4	30	5°	40	TS5	TKY25F	
S40TSDQCR15	☆	●		1504 <sub>00</sub>	40	300	63	27	9.4	37	5°	50	TS5	TKY25F	

\* Clamp Torque (N · m) : TS25=1.0, TS4=3.5, TS5=7.5

C <sub>0</sub> 00SDQC			Carbide Shank DC <sub>0</sub> inserts									Finish	Finish	Light	Light
												FP	FM	LP	LM
												(07,11)	(07,11)	(07,11)	(07,11)
												Medium	Medium	Flat Top	PCBN/PCD
												MP	MM		
Order Number	Stock		Insert Number	Dimensions (mm)								*			
	R	L		DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Clamp Screw	Wrench		
C10KSDQCR07	●		DCMT DCET DCGT DCMW DCGW	0702 <sub>00</sub>	10	125	16	7	2.1	9	13°	13	TS25	TKY08F	
C12MSDQCR07	●			0702 <sub>00</sub>	12	150	20	9	3.1	11	10°	16	TS25	TKY08F	
C16RSDQCR07	●			0702 <sub>00</sub>	16	200	25	11	3.1	14	7°	20	TS25	TKY08F	
C20SSDQCR11	☆	●		11T3 <sub>00</sub>	20	250	32	13	3.1	18	7°	25	TS4	TKY15F	
C25TSDQCR15	☆	★		1504 <sub>00</sub>	25	300	40	17	4.9	23	5°	32	TS5	TKY25F	

\* Clamp Torque (N · m) : TS25=1.0, TS4=3.5, TS5=7.5

## RECOMMENDED CUTTING CONDITIONS

Steel Shank			l/d ≤ 3			l/d = 3 - 4 (Shank Diameter ≥ 25mm)		
Carbide Shank			l/d ≤ 5			l/d = 6 - 7		
Work Material	Hardness	Cutting Mode	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
P Carbon Steel Alloy Steel	180-350HB	Light Cutting	130 (90-160)	0.1 (0.05-0.15)	0.2	120 (80-150)	0.1 (0.05-0.15)	0.2
		Medium Cutting	90 (60-120)	0.25 (0.15-0.35)	-3.0	80 (50-110)	0.15 (0.1-0.2)	-1.5
M Stainless Steel	≤200HB	Light Cutting	140 (100-180)	0.1 (0.05-0.15)	0.2	140 (100-180)	0.1 (0.05-0.15)	0.2
		Medium Cutting	70 (50-90)	0.2 (0.15-0.25)	-2.0	60 (40-80)	0.15 (0.1-0.2)	-1.0
N Aluminium Alloy	-	Light Cutting	300 (200-400)	0.1 (0.05-0.15)	0.2	300 (200-400)	0.1 (0.05-0.15)	0.2
		Medium Cutting	200 (150-250)	0.1 (0.05-0.15)	-2.0	200 (150-250)	0.1 (0.05-0.15)	-1.5

DC<sub>0</sub> type inserts > A147 - A152  
PCBN & PCD inserts > B054, B055, B068

SPARE PARTS > N001  
TECHNICAL DATA > P001

# BORING BARS

## S TYPE BORING BARS

- The minimum cutting diameter is from  $\phi 20$ .
- ISO standard.
- 7° positive insert.
- Screw-on type.
- l/d is 3 to 5 times the diameter (Carbide shank is 7 times the diameter).

S			VC Inserts									Finish	Finish	Light	Light
Order Number	Stock		Insert Number	Dimensions (mm)								FP	FM	LP	LM
	R	L		DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	(11,16)	(11,16)	(11,16)	(11,16)
S16MSVQCR/L11	●	●	VCMW VCMT VCGW VCGT	1103	16	150	25	11	3.9	14	7°	20	TS25	TKY08F	
S20QSVQCR/L11	●	●		1103	20	180	32	13	4.4	18	7°	25	TS25	TKY08F	
S25RSVQCR/L16	☆	●		1604	25	200	40	17	6.9	23	5°	32	TS4	TKY15F	
S32SSVQCR/L16	☆	●		1604	32	250	50	22	8.4	30	5°	40	TS4	TKY15F	
S40TSVQCR/L16	☆	●		1604	40	300	63	27	9.4	37	5°	50	TS4	TKY15F	

\* Clamp Torque (N · m) : TS25=1.0, TS4=3.5

C			Carbide shank VC Inserts									Finish	Finish	Light	Light
Order Number	Stock		Insert Number	Dimensions (mm)								FP	FM	LP	LM
	R	L		DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	(11,16)	(11,16)	(11,16)	(11,16)
C16RSVQCR11	●	●	VCMW VCMT VCGW VCGT	1103	16	200	25	11	3.1	14	7°	20	TS25	TKY08F	
C20SSVQCR11	☆	●		1103	20	250	32	13	3.1	18	7°	25	TS25	TKY08F	
C25TSVQCR16	☆	●		1604	25	300	40	17	4.9	23	5°	32	TS4	TKY15F	

\* Clamp Torque (N · m) : TS25=1.0, TS4=3.5

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

Note 2) Dimensions shown for insert corner RE 0.4. (Model of ☆ Mark is RE 0.8)

Note 3) When using insert with right and left hand chipbreaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

E

BORING BARS

● : Inventory maintained. ☆ : Inventory maintained in Japan.

VC type inserts > A167-A169  
PCBN & PCD inserts > B060, B071

S <sup>○</sup> SSKC			SC <sup>○</sup> inserts								Finish	Finish	Light	Light
											FP	FM	LP	LM
											(09)	(09)	(09)	(09)
											Medium	Medium	Medium	Flat Top
											MP	MM	Standard	(09,12)
Order Number	Stock		Insert Number		Dimensions (mm)						*			
	R	L			DCON	LF	LDRED	WF	H	GAMF	DMIN	Clamp Screw	Wrench	
S16MSSKCR/L09 <sup>☆</sup>	●	●	SCMW SCMT	09T3 <sup>○</sup>	16	150	25	11	14	7°	20	TS4	TKY15F	
S20QSSKCR/L09 <sup>☆</sup>	●	●		09T3 <sup>○</sup>	20	180	32	13	18	7°	25	TS4	TKY15F	
S25RSSKCR/L12 <sup>☆</sup>	★	★		1204 <sup>○</sup>	25	200	40	17	23	5°	32	TS5	TKY25F	

\* Clamp Torque (N · m) : TS4=3.5, TS5=7.5

S <sup>○</sup> SVUC			VC <sup>○</sup> inserts								Finish	Finish	Light	Light
											FP	FM	LP	LM
											(11,16)	(11,16)	(11,16)	(11,16)
											Medium	Medium	Medium	Flat Top
											MP	MM	Standard	(16)
Order Number	Stock		Insert Number		Dimensions (mm)						*			
	R	L			DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Clamp Screw	Wrench
S20QSVUCR/L11	●	●	VCMW VCMT VCGW VCGT	1103 <sup>○</sup>	20	180	32	13	4.4	18	7°	25	TS25	TKY08F
S25RSVUCR/L16 <sup>☆</sup>	●	●		1604 <sup>○</sup>	25	200	40	17	6.9	23	5°	32	TS4	TKY15F
S32SSVUCR/L16 <sup>☆</sup>	●	●		1604 <sup>○</sup>	32	250	50	22	8.4	30	5°	40	TS4	TKY15F
S40TSVUCR/L16 <sup>☆</sup>	●	●		1604 <sup>○</sup>	40	300	63	27	9.4	37	5°	50	TS4	TKY15F

\* Clamp Torque (N · m) : TS25=1.0, TS4=3.5

## RECOMMENDED CUTTING CONDITIONS

Steel Shank			l/d ≤ 3			l/d = 3–4 (Shank Diameter ≥ 25mm)		
Carbide Shank			l/d ≤ 5			l/d = 6–7		
Work Material	Hardness	Cutting Mode	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
P Carbon Steel Alloy Steel	180–350HB	Light Cutting	130 (90–160)	0.1 (0.05–0.15)	0.2	120 (80–150)	0.1 (0.05–0.15)	0.2
		Medium Cutting	90 (60–120)	0.25 (0.15–0.35)	–3.0	80 (50–110)	0.15 (0.1–0.2)	–1.5
M Stainless Steel	≤200HB	Light Cutting	140 (100–180)	0.1 (0.05–0.15)	0.2	140 (100–180)	0.1 (0.05–0.15)	0.2
		Medium Cutting	70 (50–90)	0.2 (0.15–0.25)	–2.0	60 (40–80)	0.15 (0.1–0.2)	–1.0
N Aluminium Alloy	—	Light Cutting	300 (200–400)	0.1 (0.05–0.15)	0.2	300 (200–400)	0.1 (0.05–0.15)	0.2
		Medium Cutting	200 (150–250)	0.1 (0.05–0.15)	–2.0	200 (150–250)	0.1 (0.05–0.15)	–1.5

SC<sup>○</sup> type inserts > A155, A156  
VC<sup>○</sup> type inserts > A167–A169  
PCBN & PCD inserts > B060, B071

SPARE PARTS > N001  
TECHNICAL DATA > P001

# BORING BARS

## S TYPE BORING BARS

- The minimum cutting diameter is from  $\phi 20$ .
- ISO standard.
- 7° positive insert.
- Screw-on type.

S		SCZC		CC inserts								Finish	Finish	Light	Light
												FP	FM	LP	LM
												(06,09)	(06,09)	(06,09)	(06,09)
												Medium	Medium	Flat Top	PCBN/PCD
												(06,09)	(06,09)	(06,09)	(06,09)
Order Number		Stock		Insert Number		Dimensions (mm)						*			
		R	L			DCON	OAL	LF	WF	WF2	H	GAMF	DMIN	Clamp Screw	Wrench
S16MSCZCR/L06		●	●	CC-B	0602	16	161	150	11	3	14	10°	20	TS25	TKY08F
S20QSCZCR/L09		●	●	CC-H CC-T CC-W	09T3	20	198	180	13	3	18	7°	25	TS4	TKY15F

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

Note 2) When using inserts with right or left hand chipbreakers, please use right hand inserts for right hand holders and left hand inserts for left hand holders.

\* Clamp Torque (N · m) : TS25=1.0, TS4=3.5

E

BORING BARS

## RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Cutting Mode	l/d ≤ 3			l/d = 3 - 4 (Shank Diameter ≥ 25mm)		
			Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
P Carbon Steel Alloy Steel	180-350HB	Light Cutting	130 (90-160)	0.1 (0.05-0.15)	0.2	120 (80-150)	0.1 (0.05-0.15)	0.2
		Medium Cutting	90 (60-120)	0.25 (0.15-0.35)	-3.0	80 (50-110)	0.15 (0.1-0.2)	-1.5
M Stainless Steel	≤200HB	Light Cutting	140 (100-180)	0.1 (0.05-0.15)	0.2	140 (100-180)	0.1 (0.05-0.15)	0.2
		Medium Cutting	70 (50-90)	0.2 (0.15-0.25)	-2.0	60 (40-80)	0.15 (0.1-0.2)	-1.0
N Aluminium Alloy	-	Light Cutting	300 (200-400)	0.1 (0.05-0.15)	0.2	300 (200-400)	0.1 (0.05-0.15)	0.2
		Medium Cutting	200 (150-250)	0.1 (0.05-0.15)	-2.0	200 (150-250)	0.1 (0.05-0.15)	-1.5

● : Inventory maintained. ★ : Inventory maintained in Japan.

CC type inserts > A139-A145  
PCBN & PCD inserts > B051, B052, B067

# P TYPE BORING BARS

- The minimum cutting diameter is from  $\phi 25$ . ● l/d is 3 times the diameter.
- ISO standard.
- Economical negative insert.
- Lever lock type and pin lock type.

A $\circ$ $\circ$ $\circ$ PSKN		With coolant hole		SN $\circ$ inserts		Finish	Light	Medium	Medium										
						FP (12)	LP (12)	MP (12)	MH (12)										
						Medium Standard (09,12)	Stainless MM (12)	G Class R/L (09,12)	PCBN/PCD (12)										
Order Number	Stock		Insert Number	Dimensions (mm)								Tools							
	R	L		DCON	LF	LDRED	WF	H	GAMF	DMIN	Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench	Plug	Clamp Pin	Pin	Screw
A20QPSKNR/L09	●	★	SNMA 0903 $\circ$	20	180	32	13	18	13°	25	—	—	—	—	HKY15R HKY25R	HGM-PT1/8 HGM-PT1/4	HP3T	P208AM	HSS03005
A25RPSKNR/L12	●	●	SNMG 1204 $\circ$	25	200	40	17	23	13°	32	MLSP42	—	—	—	HKY15R HKY30R	HGM-PT1/4 HGM-PT3/8	HP43	P210AM	HSS03005
A32SPSKNR/L12	●	●	SNGA 1204 $\circ$ SNGG	32	250	50	22	30	13°	44	LLSSN42	LLP14	LLCL14	LLCS108S	HKY30R	—	—	—	—

\*1 Pin Lock Type : A20QPSKNR/L09, A25RPSKNR/L12  
 \*2 Clamp Torque (N · m) : LLCS108S=3.3, HP3T=2.2, HP43=3.3

A $\circ$ $\circ$ $\circ$ PTFN		With coolant hole		TN $\circ$ inserts		Finish	Light	Medium	Medium										
						FP (16)	LP (16,22)	MP (16,22)	MH (16,22)										
						Medium Standard (16,22)	Stainless MM (16,22)	G Class R/L (16,22)	PCBN/PCD (16,22)										
Order Number	Stock		Insert Number	Dimensions (mm)								Tools							
	R	L		DCON	LF	LDRED	WF	H	GAMF	DMIN	Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench	Plug	Clamp Pin	Pin	Screw
A20QPTFNR/L16	●	●	TNMA 1604 $\circ$	20	180	32	13	18	15°	25	—	—	—	—	HKY15R HKY25R	HGM-PT1/8 HGM-PT1/4	HP31	P208AM	HSS03005
A25RPTFNR/L16	●	●	TNMG 1604 $\circ$	25	200	40	17	23	13°	32	MLTP32	—	—	—	HKY15R HKY25R	HGM-PT1/4 HGM-PT3/8	HP33	P208AM	HSS03005
A32SPTFNR/L16	●	●	TNMM 1604 $\circ$ TNGA	32	250	50	22	30	13°	44	LLSTN32	LLP13	LLCL13	LLCS106	HKY25R	—	—	—	—
A40TPTFNR/L22	●	●	TNGG 2204 $\circ$	40	300	63	27	37	10°	54	LLSTN42	LLP14	LLCL14	LLCS108S	HKY30R	HGM-PT3/8	—	—	—
A50UPTFNR/L22	●	●	TNGH 2204 $\circ$	50	350	80	35	47	9°	70	LLSTN42	LLP14	LLCL14	LLCS108S	HKY30R	HGM-PT3/8	—	—	—

\*1 Pin Lock Type : A20QPTFNR/L16, A25RPTFNR/L16  
 \*2 Clamp Torque (N · m) : LLCS106=2.2, LLCS108S=3.3, HP31=2.2, HP33=2.2

## RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Cutting Mode	l/d ≤ 3			l/d = 3 - 4		
			Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
<b>P</b> Carbon Steel Alloy Steel	180—350HB	Medium Cutting	110 (80—140)	0.25 (0.1—0.4)	—5.0	110 (80—140)	0.2 (0.1—0.3)	—4.0
<b>M</b> Stainless Steel	≤200HB	Medium Cutting	80 (60—100)	0.2 (0.1—0.3)	—4.0	70 (50—100)	0.15 (0.1—0.25)	—3.0
<b>K</b> Gray Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	80 (60—100)	0.25 (0.1—0.4)	—5.0	80 (60—100)	0.2 (0.1—0.3)	—4.0

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

Note 2) Dimensions shown for insert corner RE 0.4.

Note 3) When using insert with right and left hand chipbreaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

SN $\circ$ type inserts	> A113—A118
TN $\circ$ type inserts	> A119—A125
PCBN & PCD inserts	> B043—B045, B065

SPARE PARTS	> N001
TECHNICAL DATA	> P001

# BORING BARS

## P TYPE BORING BARS

- The minimum cutting diameter is from  $\phi 20$ .
- ISO standard.
- Economical negative insert.
- Lever lock type and pin lock type.

A○○○PDUN		With coolant hole		DN○○inserts							Finish										
											FP	Light	Medium	Medium							
											(15)	(11,15)	(15)	(15)							
											Medium	Stainless	G Class	PCBN/PCD							
											Standard	MM	R/L								
											(11,15)	(15)	(15)	(15)							
Order Number	Stock		Insert Number	Dimensions (mm)									Tools								
	R	L		DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench	Plug	Clamp Pin	Pin	Screw	
A20QPUNR/L11	●●		1104○○	20	180	32	15	6.4	18	13°	26	—	—	LLCL23S	LLCS125	HKY20R	HGM-PT1/8	—	—	—	
A25RPUNR/L11	●●		DNMA	1104○○	25	200	40	17	6.9	23	15°	32	LLSDN32	LLP13	LLCL23	LLCS106	HKY25R	HGM-PT1/4	—	—	—
A25RPUNR/L15	●●		DNMG	1504○○	25	200	40	17	6.9	23	13°	32	MLDP42	—	—	—	HKY15R HKY30R	HGM-PT1/4	HP43	P210AM	HSS03005
A32SPUNR/L11	●●		DNMX	1104○○	32	250	50	22	8.4	30	13°	44	LLSDN32	LLP13	LLCL23	LLCS106	HKY25R	HGM-PT3/8	—	—	—
A32SPUNR/L15	●●		DNMM	1504○○	32	250	50	22	8.4	30	13°	44	LLSDN42	LLP14	LLCL24	LLCS108S	HKY30R	HGM-PT3/8	—	—	—
A40TPUNR/L15	●●		DNGA	1504○○	40	300	63	27	9.4	37	10°	54	LLSDN42	LLP14	LLCL24	LLCS108S	HKY30R	HGM-PT3/8	—	—	—
A50UPUNR/L15	●●		DNGG	1504○○	50	350	80	35	12.4	47	9°	70	LLSDN42	LLP14	LLCL24	LLCS108S	HKY30R	HGM-PT3/8	—	—	—

\*1 Pin Lock Type : A25RPUNR/L15

\*2 Clamp Torque (N · m) : LLCS125=1.5, LLCS106=2.2, LLCS108S=3.3, HP43=3.3

A○○○PCLN		With coolant hole		CN○○inserts							Finish									
											FP	Light	Light	Medium						
											(12)	(12)	(12)	(12)						
											Medium	Medium	Stainless	PCBN/PCD						
											MH	Standard	MM							
											(12)	(09,12)	(12)	(12)						
Order Number	Stock		Insert Number	Dimensions (mm)									Tools							
	R	L		DCON	LF	LDRED	WF	H	GAMF	DMIN	Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench	Plug	Clamp Pin	Pin	Screw	
A16MPCLNR/L09	●●		09T3○○	16	150	25	11	14	15°	20	—	—	LLCL13S	LLCS105	HKY20R	HGM-PT1/8	—	—	—	
A20QPCLNR/L09	●●		09T3○○	20	180	32	13	18	13°	25	—	—	—	—	HKY25R HKY15R	HGM-PT1/8	HP3T	P208AM	HSS03005	
A20QPCLNR/L09N	●★		CNMA	09T3○○	20	180	32	13	18	13°	25	—	—	LLCL13S	LLCS105	HKY20R	HGM-PT1/8	—	—	—
A25RPCLNR/L09	●★		CNMG	09T3○○	25	200	40	17	23	13°	32	—	—	LLCL13S	LLCS105	HKY20R	HGM-PT1/4	—	—	—
A25RPCLNR/L12	●●		CNMM	09T3○○	25	200	40	17	23	13°	32	MLCP42	—	—	—	HKY30R HKY15R	HGM-PT1/4	HP43	P210AM	HSS03005
A32SPCLNR/L12	●●		CNGA	1204○○	32	250	50	22	30	13°	44	LLSCN42	LLP14	LLCL14	LLCS108S	HKY30R	HGM-PT3/8	—	—	—
A40TPCLNR/L12	●●		CNGG	1204○○	40	300	63	27	37	10°	54	LLSCN42	LLP14	LLCL14	LLCS108S	HKY30R	HGM-PT3/8	—	—	—
A50UPCLNR12	●●		CNGM	1204○○	50	350	80	35	47	10°	63	LLSCP42	LLP14	LLCL14	LLCS108S	HKY30R	HGM-PT3/8	—	—	—

\*1 Pin Lock Type : A20QPCLNR/L09, A25RPCLNR/L12

\*2 Clamp Torque (N · m) : LLCS105=1.5, LLCS106=2.2, LLCS108S=3.3, HP3T=2.2, HP43=3.3

\*3 When replacing clamp Lever LLCL13S, please consider purchasing lever spring HLS2 as necessary.

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

Note 2) Dimensions shown for insert corner RE 0.4.

Note 3) When using insert with right and left hand chipbreaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

● : Inventory maintained. ★ : Inventory maintained in Japan.

DN○○ type inserts	> A105—A111
CN○○ type inserts	> A098—A104, A136
PCBN & PCD inserts	> B036—B042, B064

A○○○PWLN		With coolant hole		WN○○inserts							Light	Medium			
											Stainless				
											MM				
											Right hand tool holder shown.				
Order Number	Stock		Insert Number	Dimensions (mm)							*2		*1		
	R	L		DCON	LF	LDRED	WF	H	GAMF	DMIN	Clamp Lever	Clamp Screw	Wrench	Plug	
A16MPWLN/L06	●	●	WNMG	06T3○○	16	150	25	11	14	15°	20	LLCL13S	LLCS105	HKY20R	HGM-PT1/8
A20QPWLN/L06	●	●		06T3○○	20	180	32	13	18	13°	25	LLCL13S	LLCS105	HKY20R	HGM-PT1/8
A25RPWLN/L06	●	●		06T3○○	25	200	40	17	23	13°	32	LLCL13S	LLCS105	HKY20R	HGM-PT1/4

\*1 Clamp Torque (N · m) : LLCS105=1.5

\*2 When replacing clamp Lever LLCL13S, please consider purchasing lever spring HLS2 as necessary.

A○○○PDQN		With coolant hole		DN○○inserts							Finish	Light	Medium	Medium						
											Medium	Stainless	G Class	PCBN/PCD						
											Standard	MM	R/L							
											Right hand tool holder shown.									
Order Number	Stock		Insert Number	Dimensions (mm)							*2		*2							
	R	L		DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench	Plug	Clamp Pin	Pin	Screw
A25RPDQNR/L15	●	●	DNMA 1504○○	25	200	40	17	6.9	23	13°	32	MLDP42	—	—	—	HKY15R HKY30R	HGM-PT1/4	HP43	P210AM	HSS03005
A32SPDQNR/L15	●	●	DNMG 1504○○	32	250	50	22	8.4	30	13°	44	LLSDN42	LLP14	LLCL24	LLCS108S	HKY30R	HGM-PT3/8	—	—	—
A40TPDQNR/L15	●	●	DNGA 1504○○	40	300	63	27	9.4	37	10°	54	LLSDN42	LLP14	LLCL24	LLCS108S	HKY30R	HGM-PT3/8	—	—	—
A50UPDQNR/L15	★	●	DNGM 1504○○	50	350	80	35	12.4	47	9°	70	LLSDN42	LLP14	LLCL24	LLCS108S	HKY30R	HGM-PT3/8	—	—	—

\*1 Pin Lock Type : A25RPDQNR/L15

\*2 Clamp Torque (N · m) : LLCS108S=3.3, HP43=3.3

## RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Cutting Mode	l/d ≤ 3			l/d = 3 - 4		
			Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
<b>P</b> Carbon Steel Alloy Steel	180—350HB	Medium Cutting	110 (80—140)	0.25 (0.1—0.4)	—5.0	110 (80—140)	0.2 (0.1—0.3)	—4.0
<b>M</b> Stainless Steel	≤200HB	Medium Cutting	80 (60—100)	0.2 (0.1—0.3)	—4.0	70 (50—100)	0.15 (0.1—0.25)	—3.0
<b>K</b> Gray Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	80 (60—100)	0.25 (0.1—0.4)	—5.0	80 (60—100)	0.2 (0.1—0.3)	—4.0

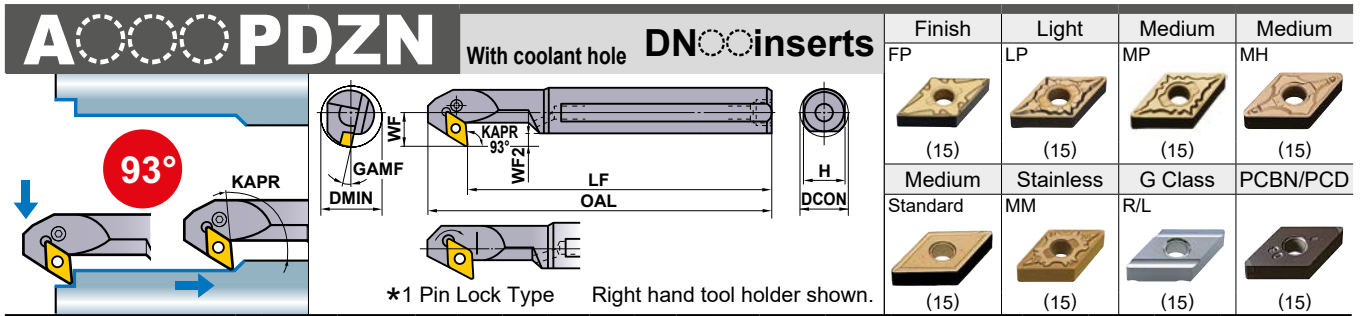
WN○○ type inserts > A130—A133  
 DN○○ type inserts > A105—A111  
 PCBN & PCD inserts > B039—B042, B064

SPARE PARTS > N001  
 TECHNICAL DATA > P001

# BORING BARS

## P TYPE BORING BARS

- The minimum cutting diameter is from  $\phi 32$ .
- ISO standard.
- Economical negative insert.
- Lever lock type and pin lock type.



Order Number	Stock		Insert Number	Dimensions (mm)										Tools											
	R	L		DCON	OAL	LF	WF	WF2	H	GAMF	DMIN	Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench	Plug	Clamp Pin	Pin	Screw					
A25RPDZNR/L15	●	●	DNMA DNMG	1504	25	225	200	17	6.7	23	13°	32	MLDP42	—	—	—	HKY15R HKY30R	HGM-PT1/4	HP43	P210AM	HSS03005				
A32SPDZNR/L15	●	●	DNMX DNMM	1504	32	275	250	22	8.2	30	13°	40	LLSDN42	LLP14	LLCL24	LLCS108S	HKY30R	HGM-PT3/8	—	—	—				
A40TPDZNR/L15	●	●	DNGA DNGG	1504	40	325	300	27	9.2	37	10°	50	LLSDN42	LLP14	LLCL24	LLCS108S	HKY30R	HGM-PT3/8	—	—	—				
A50UPDZNR/L15	●	●	DNGG DNGM	1504	50	375	350	35	12.2	47	9°	63	LLSDN42	LLP14	LLCL24	LLCS108S	HKY30R	HGM-PT3/8	—	—	—				

\*1 Pin Lock Type

\*2 Clamp Torque (N · m) : LLCS108S=3.3, HP43=3.3

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

Note 2) Dimensions shown for insert corner RE 0.8.

Note 3) When using inserts with right or left hand chipbreakers, please use right hand inserts for right hand holders and left hand inserts for left hand holders.

BORING BARS

## RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Cutting Mode	l/d ≤ 3			l/d = 3 - 4		
			Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)
P Carbon Steel Alloy Steel	180—350HB	Medium Cutting	110 (80—140)	0.25 (0.1—0.4)	—5.0	110 (80—140)	0.2 (0.1—0.3)	—4.0
M Stainless Steel	≤200HB	Medium Cutting	80 (60—100)	0.2 (0.1—0.3)	—4.0	70 (50—100)	0.15 (0.1—0.25)	—3.0
K Gray Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	80 (60—100)	0.25 (0.1—0.4)	—5.0	80 (60—100)	0.2 (0.1—0.3)	—4.0

● : Inventory maintained. ★ : Inventory maintained in Japan.

DN type inserts

➤ A105—A111

PCBN & PCD inserts

➤ B039—B042, B064





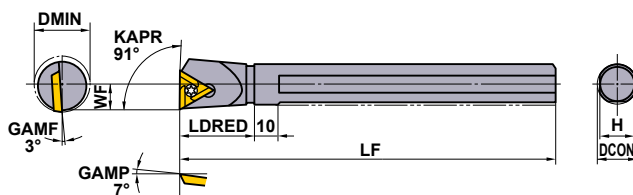
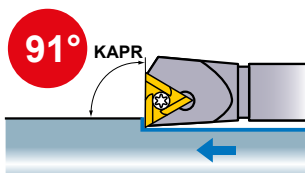
# AL TYPE BORING BARS

- Suitable for non-ferrous metal.
- 20° positive insert.
- Screw-on type.
- l/d is 6 times the diameter.
- Excellent vibration resistance.
- The minimum cutting diameter is from  $\phi 20$ .



## SSTFE

## TE inserts

Medium	PCD
R/L  (16)	R/L  (16)
PCD  (16)	



Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)						*  		
	R	L		DCON	LF	LDRED	WF	H	DMIN	Clamp Screw	Wrench	
<b>S16RSTFER/L16</b>	★	★	TEGX	1603	16	200	30	11	14.6	<b>20</b>	FC400890T	TKY10F
<b>S20RSTFER/L16</b>	★	★		1603	20	200	37	13	18	<b>25</b>	FC400890T	TKY10F
<b>S25SSTFER/L16</b>	★	★		1603	25	250	40	17	23	<b>32</b>	FC400890T	TKY10F

\* Clamp Torque (N · m) : FC400890T=2.5

Note 1) The insert photos are only examples. The letters refer to the chipbreaker and the dimension refers to the inscribed circle.

Note 2) Dimensions shown for insert corner RE 0.4.

Note 3) When using insert with right and left hand chipbreaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

E

BORING BARS

## RECOMMENDED CUTTING CONDITIONS

Work Material	Grade	Cutting Speed (m/min)	l/d=3		l/d=4		l/d=5		l/d=6	
			Feed (mm/rev)	Depth of Cut (mm)	Feed (mm/rev)	Depth of Cut (mm)	Feed (mm/rev)	Depth of Cut (mm)	Feed (mm/rev)	Depth of Cut (mm)
N Aluminium Alloy	HTi10	400 (200-600)	0.15 (0.05-0.25)	-3.0	0.15 (0.05-0.25)	-3.0	0.1 (0.05-0.2)	-2.5	0.1 (0.05-0.2)	-1.0
	MD220	800 (200-1500)	0.15 (0.05-0.25)	-3.0	0.15 (0.05-0.25)	-3.0	0.1 (0.05-0.2)	-2.5	0.1 (0.05-0.2)	-1.0

TE type inserts > A161  
 PCD inserts > B073  
 SPARE PARTS > N001  
 TECHNICAL DATA > P001

# Memo

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# Memo

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# HOW TO READ THE STANDARD OF GROOVING AND CUTTING OFF

## ●How this section page is organised

- ① Classified according to external or internal applications.
- ② Sub-classified according to product series.  
(Refer to the index on the next page.)

**FIGURE SHOWING THE TOOLING APPLICATION**  
Uses illustrations and arrows to depict available machining applications such as cutting off, grooving, and copying.

**INDICATION OF HOLDER TYPE ACCORDING TO APPLICATION**  
Indicates the holder types, such as the 00° type or the 90° type, according to machining application.

**TITLE OF PRODUCT**

**GEOMETRY**

**PRODUCT SECTION**

**INDICATION OF EXTERNAL/FACE/INTERNAL APPLICATION**

**SPARE PARTS FOR HOLDER**

**GROOVING / CUTTING OFF**

**GY SERIES (EXTERNAL)**

**1 00° type holder**

Note 1) For modular blades and modular holders, please order separately.  
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

Seat Size	Dimensions (mm)				Type	Holder	Modular Blade	Stock	Fig.	Dimensions (mm)								Cutting Mode
	CW	CDX	CUTDIA							H	B	LF	LH	LH2	HF	WF	HBH	
D 2.00 2.24	6	12	Modular	R	GYHR1616J00-M20R	GYM20RA-D06	3	16	16	104	28	44	16	20	4	R	Anticlockwise	
				L	GYHL1616J00-M20L	GYM20LA-D06	3	16	16	104	28	44	16	20	4			
			Mono Block	R	GYR2020K00-D06	---	7	20	20	125	36	---	20	20	15			---
				L	GYL2020K00-D06	---	7	20	20	125	36	---	20	20	15			---
			Modular	R	GYHR2020K00-M20R	GYM20RA-D06	1	20	20	119	28	43	20	23	---			---
				L	GYHL2020K00-M20L	GYM20LA-D06	1	20	20	119	28	43	20	23	---			---
		10	20	Modular	R	GYHR2020K00-M25R	GYM25RA-D06	3	20	20	117	31	52	20	26			5
					L	GYHL2020K00-M25L	GYM25LA-D06	3	20	20	117	31	52	20	26			5
			Mono Block	R	GYR2525M00-D06	---	7	25	25	150	36	---	25	25	15			---
				L	GYL2525M00-D06	---	7	25	25	150	36	---	25	25	15			---
			Modular	R	GYHR2525M00-M25R	GYM25RA-D06	1	25	25	142	31	49	25	28	---			---
				L	GYHL2525M00-M25L	GYM25LA-D06	1	25	25	142	31	49	25	28	---			---
	12	24	Modular	R	GYHR3225P00-M25L	GYM25LA-D06	5	32	25	162	31	49	32	28	---			
				L	GYHL3225P00-M25L	GYM25LA-D06	5	32	25	162	31	49	32	28	---			
			Modular	R	GYHR3225P00-M25R	GYM25RA-D06	5	32	32	162	31	49	32	35	---			
				L	GYHL3225P00-M25L	GYM25LA-D06	5	32	32	162	31	49	32	35	---			
			Mono Block	R	GYR3225P00-D10	---	3	16	16	110	34	50	16	20	4	---		
				L	GYL3225P00-D10	---	3	16	16	110	34	50	16	20	4	---		
		18 *4	36	Modular	R	GYHR2020K00-M20R	GYM20RA-D10	1	20	20	125	34	49	20	23	---		
					L	GYHL2020K00-M20L	GYM20LA-D10	1	20	20	125	34	49	20	23	---		
			Modular	R	GYHR2020K00-M25R	GYM25RA-D12	3	20	20	125	39	60	20	26	5			
				L	GYHL2020K00-M25L	GYM25LA-D12	3	20	20	125	39	60	20	26	5			
			Mono Block	R	GYR2020K00-D18	---	7	20	20	125	39	60	20	26	5	---		
				L	GYL2020K00-D18	---	7	20	20	125	39	60	20	26	5	---		
20 *1	40 *2	Modular	R	GYHR2020K00-M20R	GYM20RA-D20	4	20	20	131	45	66	20	26	5				
			L	GYHL2020K00-M20L	GYM20LA-D20	4	20	20	131	45	66	20	26	5				
	Mono Block	R	GYR2525M00-D20	---	7	25	25	150	41	---	25	25	1	---				
		L	GYL2525M00-D20	---	7	25	25	150	41	---	25	25	1	---				
	Modular	R	GYHR2525M00-M25R	GYM25RA-D20	2	25	25	156	45	63	25	28	---					
		L	GYHL2525M00-M25L	GYM25LA-D20	2	25	25	156	45	63	25	28	---					
Modular	R	GYHR3225P00-M25R	GYM25RA-D20	6	32	25	176	45	63	32	35	---						
	L	GYHL3225P00-M25L	GYM25LA-D20	6	32	25	176	45	63	32	35	---						

**SPARE PARTS**

Holder	Clamp Screw	Blade Screw	Wrench
GYHRLOOOOOOOOO	HSC0020 (Clamp Torque : 7.5N.m)	---	HKY40R
GYHRLOOOOOO020RL	GY6013M (Clamp Torque : 6.5N.m)	TS407 (Clamp Torque : 3.5N.m)	QTKY30R QTKY15D
GYHRLOOOOOO020RL	---	TS55 (Clamp Torque : 5.5N.m)	QTKY30R QTKY25D

**Insert selection**

Geometry name:

For grooving/cutting off breaker: F012, F013

For multifunctional grooving breaker: F014, F015

Standard insert with dimensions

**LEGEND FOR STOCK STATUS MARK**  
Is shown on the left hand page of each double-page spread.

**PRODUCT STANDARDS**  
Indicates order numbers, stock status (per right/left hand), holders, modular blades, groove widths, maximum groove depths, maximum cut-off diameters, dimensions, and applicable inserts.

**PAGE REFERENCE**  
- CAUTION FOR USE  
- CUTTING CONDITIONS  
- IDENTIFICATION  
Indicates reference pages, on the right hand page of each double-page spread.

# TURNING TOOLS

## GROOVING AND CUTTING OFF

CLASSIFICATION (EXTERNAL).....	F002
CLASSIFICATION (INTERNAL).....	F003

### STANDARD OF GROOVING AND CUTTING OFF TOOLS

#### EXTERNAL

FEATURES OF THE GY SERIES .....	F004
GY SERIES ORDER NUMBER.....	F008
GY SERIES INSERTS .....	F012
GY SERIES REFERENCE MATERIAL .....	F016
GY SERIES.....	F018
GW SERIES.....	F114
MG HOLDER .....	F124

#### INTERNAL

GY SERIES.....	F082
MICRO-MINI BORING BARS .....	F126
MICRO-MINI TWIN BORING BARS .....	F127



\*Arranged by Alphabetical order








- F126 C<sup>o</sup>OR-BLS
- F127 CG
- F120 GW1
- F118 GWB
- F119 GWTB
- F012 GY
- F124 MGH
- F125 MGT
- F129 RBH
- F130 SBH

# CLASSIFICATION

## EXTERNAL CUTTING

Name of Tool Holder	Insert Shape	Features	Groove Width According to Cutting Mode (mm)					
			Shallow Grooving	Deep Grooving	Cutting Off	Copying	Recessing	Face Grooving
<b>GY Series</b>   F018		Modular blade type ● Clamp-on type. ● The modular blade allows for high rigidity and accuracy. (Triforce System) ● Various insert types.  Monoblock type ● Spring clamp type. ● Maximum cut off diameter 50mm.	1.5	1.5	1.5	2	2	2
			2	2	2			
			2.24	2.24	2.24	2.5	2.5	2.5
			2.39	2.39	2.39			
			2.5	2.5	2.5	3	3	3
			2.74	2.74	2.74			
			3	3	3	3.18	3.18	3.18
			3.18	3.18	3.18			
			3.24	3.24	3.24	4	4	4
			4	4	4			
			4.24	4.24	4.24	4.75	4.75	4.75
			4.75	4.75	4.75			
			5	5	5	6	6	6
			5.24	5.24	5.24			
			6	6	6	6.35	6.35	6.35
			6.31	6.31	6.31			
			6.35	6.35	6.35	8	8	8
			<b>GW Series</b>   F118		● Spring clamp type. ● Simple insert clamping method. ● Possible to use the blade with both external or through coolant. ● Breaker system offering excellent chip disposal properties. ● Maximum cut off diameter : 120mm.	2.0	2.0	2.0
3.0	3.0	3.0						
4.0	4.0	4.0						
5.0	5.0	5.0						
<b>MG Holder</b>   F124		● Clamp-on type. ● Precision class insert. ● Positive insert suffers from negligible chattering and thus produces a good finished surface.	1.25					
			6					
<b>SMALL TOOLS</b> <b>GTAH GTBH GTCH</b>   D018		● For gang type tool posts. ● Small Shank : 8 mm—16 mm ● Possible to control the back clamping. ● High rigidity due to design of vertical insert. ● Economical due to the design of three-corner inserts.	0.3					
			3.0					
<b>CTAH</b>   D020		● For gang type tool posts. ● Small Shank : 8 mm—16 mm ● Due to the design of handed tool holders, able to minimize accumulation of workpieces. ● High rigidity due to design of vertical insert. ● Maximum cut off diameter :12 mm	0.7	0.7	0.7			
			1.0	1.0	1.0			
			1.5	1.5	1.5			
			2.0	2.0	2.0			
<b>CTBH</b>   D015		● For gang type tool posts. ● Small Shank : 10 mm—16 mm ● Single holder for inserts for back turning and cutting off. ● High rigidity due to design of vertical insert. ● Maximum cut off diameter:16 mm	1.5	1.5	1.5			
			2.0	2.0	2.0			

## INTERNAL CUTTING

Name of Tool Holder	Insert Shape	Features	Min. Cutting Diameter (mm)	Groove Width (mm)	Max. Groove Depth (mm)
<b>MICRO-MINI TWIN Boring Bars</b>   F127	—	<ul style="list-style-type: none"> <li>● Solid carbide type.</li> <li>● Economical due to single holder with two cutting edges.</li> </ul>	3.0	1.0   2.0	1.0   2.0
<b>MICRO-MINI Boring Bars</b>   F126	—	<ul style="list-style-type: none"> <li>● Solid carbide type.</li> <li>● Insert can be ground to suit the application.</li> </ul>	3.2	2.0   3.0	1.0   2.0
<b>GY Series</b>   F082		Modular blade type <ul style="list-style-type: none"> <li>● Clamp-on type.</li> <li>● The modular blade allows for high rigidity and accuracy. (Triforce System)</li> <li>● Various insert types.</li> </ul> Monoblock type <ul style="list-style-type: none"> <li>● Spring clamp type.</li> </ul>	25	2   6.35	4   13

T

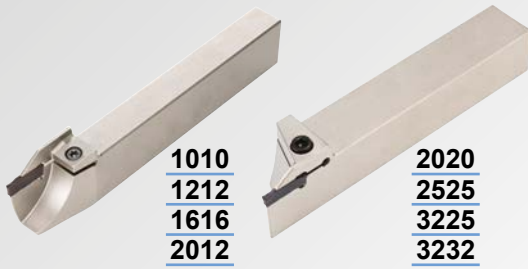
GROOVING / CUTTING OFF

# GY SERIES

**A wide selection of holders and inserts available for a diverse range of grooving and cutting off applications**

**External • Face holders**

Corresponding blades to a variety of modular holders with different shank sizes.



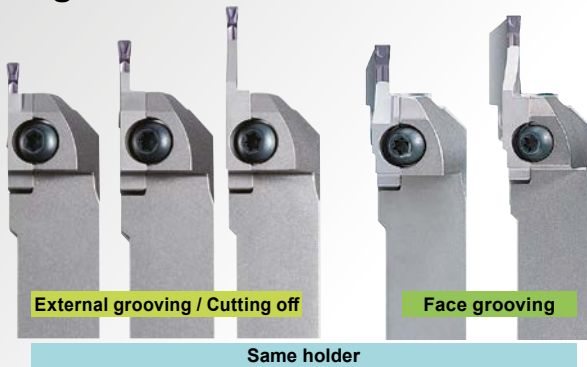
**Monoblock type**



**Modular type**

GROOVING / CUTTING OFF

Various depths of groove possible with a single tool, by using different modular blades.



Various sizes of face grooves from a wide array of modular blades.



**Internal holders**

A wide range of holders available from minimum diameter of 25 mm.

**Monoblock type**  
Min. cutting diameter  
φ25, φ32



**Modular type**  
Min. cutting diameter  
φ40, φ50,  
φ60, φ70



Short shank types are stock standard.

**Monoblock type**

**Modular type**



Short Standard

Short Standard

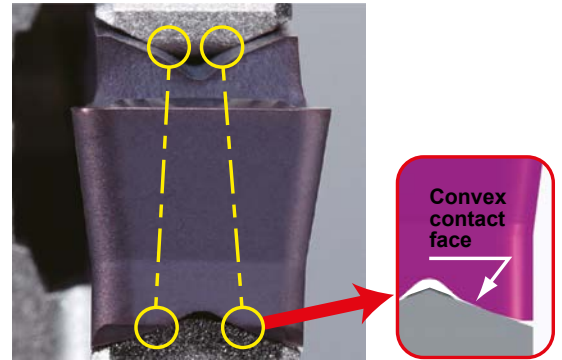
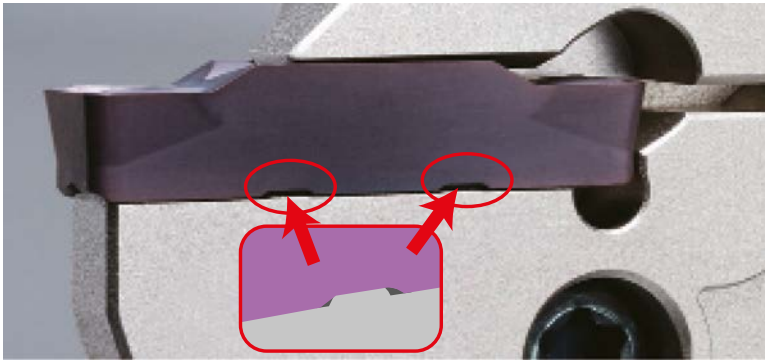


# Original insert design leading the way to new grooving and cutting off applications

Highly reliable insert clamping

Safety keys prevent insert movement.

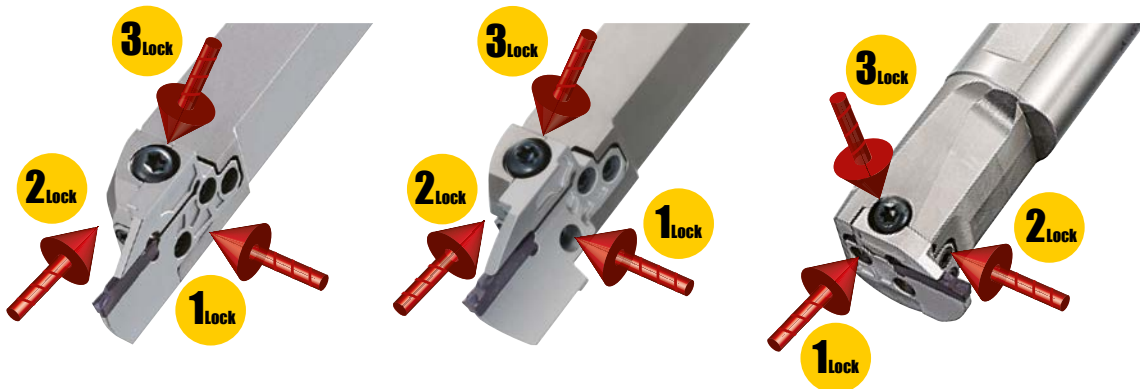
The convex geometry ensures high precision clamping.



## TRIFORCE System for increased stability and performance!

### TRIFORCE System

The TRIFORCE system ensures the blade is securely fixed in 3 directions (side, front and top), giving high rigidity for a stable grooving and cutting performance.



### A WIDE SELECTION OF INSERTS

● Selection of groove widths





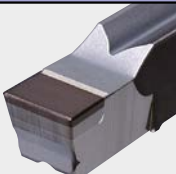
● Different corner radii available






# GROOVING / CUTTING OFF

## INSERT



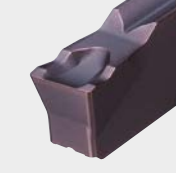
### ● Breaker system

Grooving				
				
<b>GUBreaker</b> (For Gummy Steel)	<b>GSBreaker</b> (Low feeds)	<b>GMBreaker</b> (Medium feeds)	<b>GFGS</b> (For hardened steel)	<b>GLBreaker</b> (For Aluminium Alloy)



For Multifunctional Grooving			Copying/For recessing
			
<b>MFBreaker</b> (G class)	<b>MSBreaker</b> (Low feeds)	<b>MMBreaker</b> (Medium feeds)	<b>BMBreaker</b>

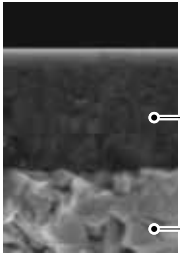
Cutting Off				
				
<b>GUBreaker</b> (For Gummy Steel)	<b>GSBreaker</b> (Low feeds)	<b>GMBreaker</b> (Medium feeds)	<b>R/L05-GMBreaker</b> (Medium feeds)	<b>GLBreaker</b> (For Aluminium Alloy)

GROOVING / CUTTING OFF

## INSERT GRADE

Work Material Machining Condition	P Steel	M Stainless Steel	K Cast Iron	N Aluminium Alloy	S Heat resistant Alloy / Titanium Alloy	H Hardened Steel
	Stable  Machining Condition  Unstable	<b>NX2525</b> <b>MY5015</b> <b>VP10RT</b> <b>VP20RT</b>	<b>VP10RT</b> <b>VP20RT</b>	<b>MY5015</b> <b>VP10RT</b> <b>VP20RT</b>	<b>RT9010</b>	<b>NEW</b> <b>MP9015</b> <b>RT9010</b> <b>NEW</b> <b>MP9025</b>

## MP9000 Series

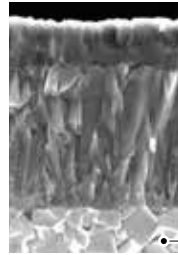


- The high Al-rich (Al, Ti)N single layer coating provides stabilization of the high hardness phase and succeeds in dramatically improving wear, crater and welding resistance.

High Al-rich (Al, Ti)N Single Layer Coating

Special Cemented Carbide Substrate

## MY5015

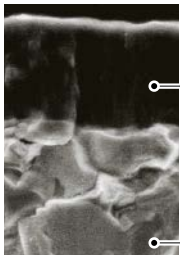


- MY5015 is a CVD coated grade with excellent wear resistance even at high temperatures. It provides longer tool life when machining cast and ductile cast irons. Also suitable for high speed continuous cutting of steels.

CVD Coated Carbide

Carbide substrate

## VP20RT (1st Recommendation)



- PVD coated grade suitable for a wide range of applications. The combination of a special tough cemented carbide substrate with MIRACLE coating provides an excellent balance of wear and fracture resistance.

MIRACLE Coating

Carbide substrate (90.5HRA)

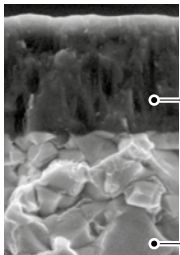
## RT9010

- First recommended grade for titanium alloys. It is not recommended for use on non-ferrous alloys.

## NX2525

- NX2525, a cermet grade for finish machining of steels and for good surface finishes at lower cutting speeds.

## VP10RT (2nd Recommendation)



- PVD coated grade with a cemented carbide substrate harder than VP20RT. For use on difficult-to-cut materials and for extending tool life.

MIRACLE Coating

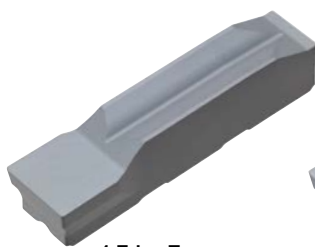
Carbide substrate (HRA92.0)

## BC8110

- A coated PCBN grade for continuous cutting, which provides longer life when machining hardened steel.

## BLANK INSERTS

- Blank inserts for custom grinding



1 Edge Type



2 Edge Type

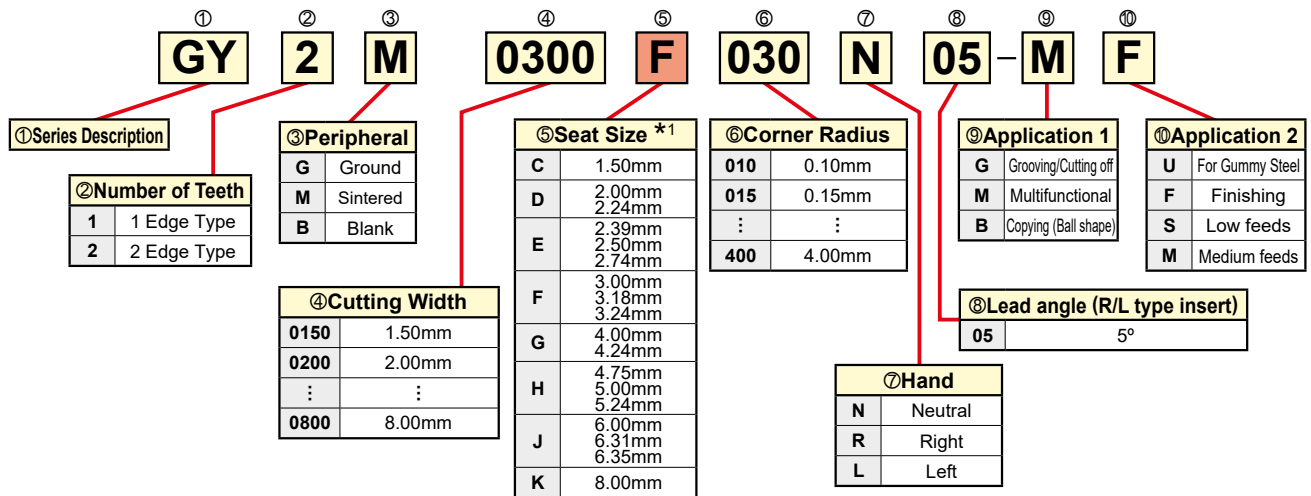
## RT9010/RT9020 for blank insert

- First recommendation for blanks inserts is RT9020 due to the tougher carbide substrate that is suitable for a wider range of applications. RT9010 has a harder substrate than RT9020 and is ideal for longer tool life on stable cutting applications. Both grades are recommended to have a coating applied that is suitable for the required application.

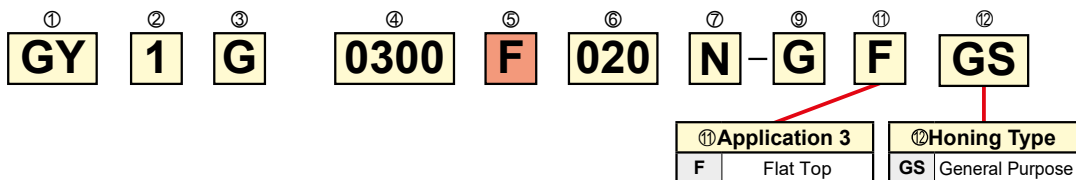
\* Blank inserts to be ground by customers.

# GY SERIES ORDER NUMBER

## ■ INSERT



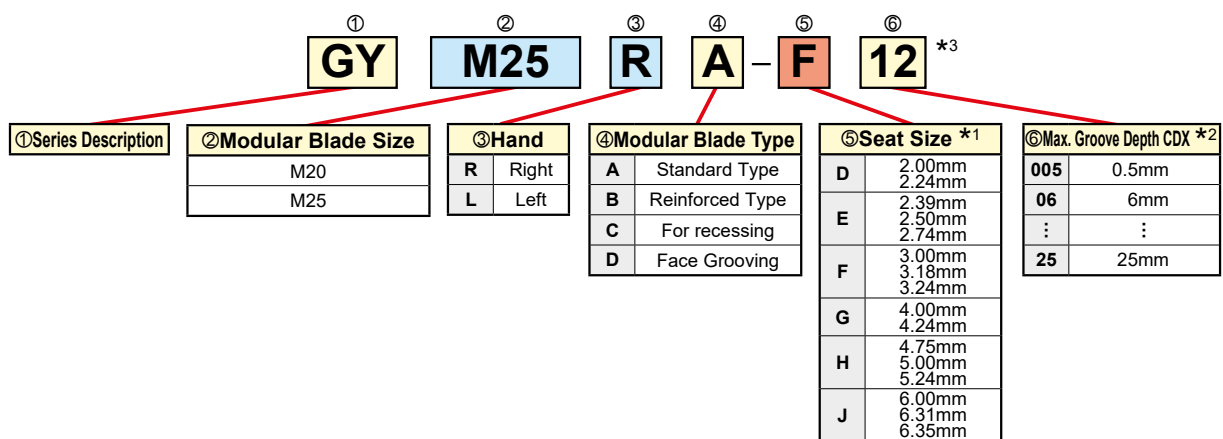
## ■ PCBN INSERT



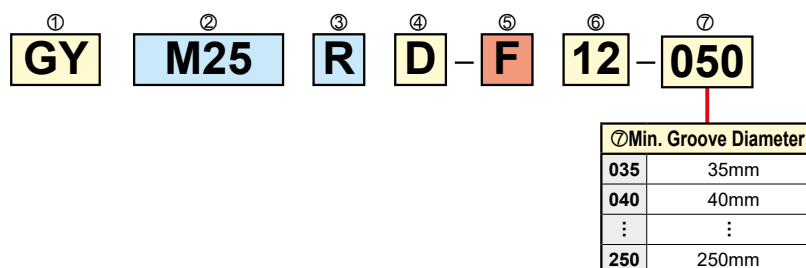
\*1 Select a seat size with the same symbol as that of modular blade and monoblock holder.

## ■ MODULAR BLADE

### ● EXTERNAL/INTERNAL/FOR RECESSING



### ● FACE GROOVING



\*1 Select a seat size with the same symbol as that of the insert.

\*2 The maximum groove depth is a value when used for external grooving and changes according to the insert used. For internal grooving, refer to the maximum groove depth on pages F082–F088.

\*3 GYM20R/LA-○10, GYM20R/LA-○12, GYM25R/LA-○12 and GYM25R/LA-○14 can be used for both external and internal grooving.

## EXTERNAL / FACE GROOVING / FOR RECESSING

### MONOBLOCK HOLDER

① **GY** ② **P** ③ **R** ④ **2525** ⑤ **M** ⑥ **00** - ⑦ **K** ⑧ **25**

① Series Description

③ Hand of Holder

R	Right
L	Left

② Holder Type

P	With monoblock offset
Q	Without monoblock offset
H	Modular holder

④ Shank Diameter (H x W)

1010	10x10mm
1212	12x12mm
1616	16x16mm
2012	20x12mm
2020	20x20mm
2525	25x25mm
3225	32x25mm
3232	32x32mm

⑤ Holder Length LF

J	110mm
JX	120mm
K	125mm
M	150mm
P	170mm

⑥ Angle (degree)

00	0°
50	50°
90	90°

⑦ Seat Size \*1

C	1.50mm
D	2.00mm 2.24mm
E	2.39mm 2.50mm 2.74mm
F	3.00mm 3.18mm 3.24mm
G	4.00mm 4.24mm
H	4.75mm 5.00mm 5.24mm
J	6.00mm 6.31mm 6.35mm
K	8.00mm

⑧ Max. Groove Depth CDX

06	6mm
08	8mm
⋮	⋮
25	25mm

### MODULAR HOLDER

① **GY** ② **H** ③ **R** ④ **2525** ⑤ **M** ⑥ **00** - ⑦ **M25** ⑧ **R**

⑦ Modular Blade Size

M20
M25

⑧ Hand of Modular Blade

R	Right
L	Left

\*1 Select a seat size with the same symbol as that of the insert.

## INTERNAL

### MONOBLOCK HOLDER

① **GY** ② **A** ③ **R** ④ **20** ⑤ **K** ⑥ **90** ⑦ **A** - ⑧ **F** ⑨ **06**

① Series Description

③ Hand of Holder

R	Right
L	Left

② Holder Type

A	Monoblock
D	Modular holder

④ Shank Diameter DCON

20	20mm
25	25mm
32	32mm
40	40mm
50	50mm

⑤ Holder Length LF

K	125mm
L	140mm
M	150mm
P	170mm
Q	180mm
R	200mm
S	250mm
T	300mm

⑥ Angle (degree)

90	90°
----	-----

⑦ Neck Length

A	30mm
B	40mm
C	50mm
D	60mm
F	80mm

⑧ Seat Size \*1

D	2.00mm 2.24mm
E	2.39mm 2.50mm 2.74mm
F	3.00mm 3.18mm 3.24mm
G	4.00mm 4.24mm
H	4.75mm 5.00mm 5.24mm
J	6.00mm 6.31mm 6.24mm

⑨ Max. Groove Depth CDX

06	6mm
07	7mm

### MODULAR HOLDER

① **GY** ② **D** ③ **R** ④ **40** ⑤ **M** ⑥ **90** ⑦ **D** - ⑧ **M25** ⑨ **L**

⑧ Modular Blade Size

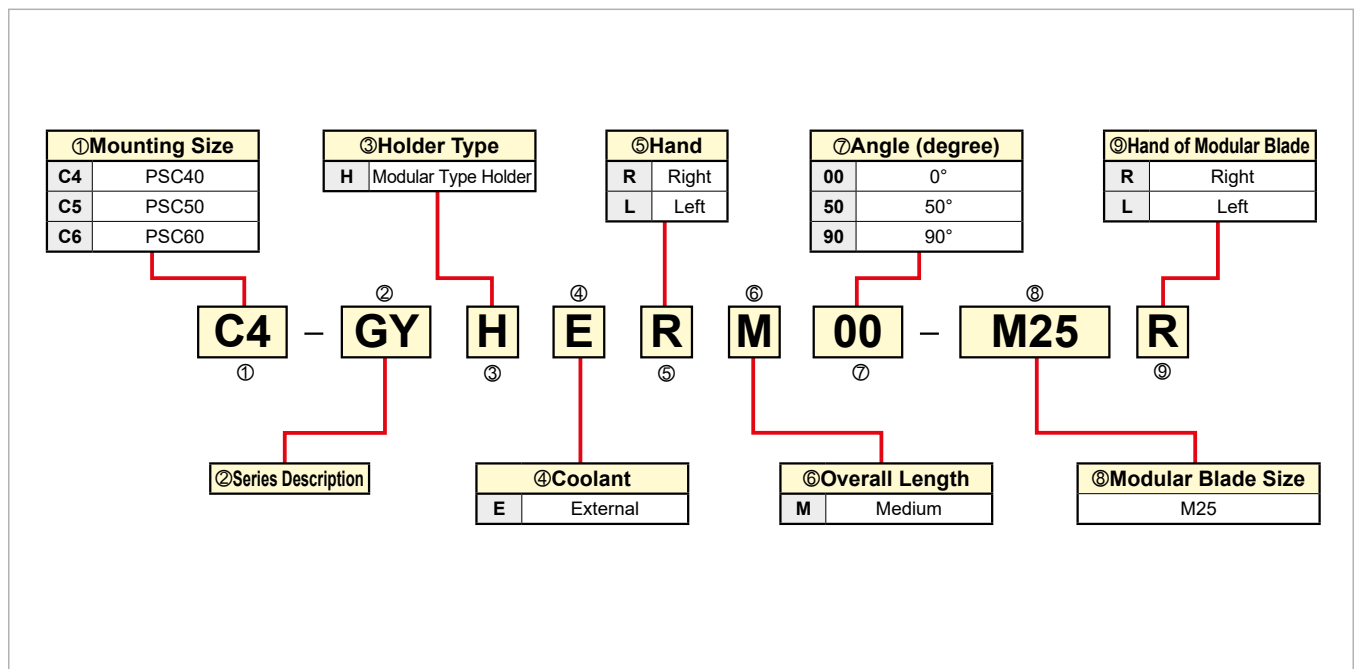
M20
M25

⑨ Hand of Modular Blade

R	Right
L	Left

\*1 Select a seat size with the same symbol as that of the insert.

# PSC HOLDER ORDER NUMBER



# Memo

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A series of horizontal dashed lines for writing, spanning the width of the page.

# GY SERIES INSERTS

## INSERTS

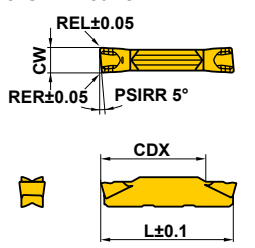
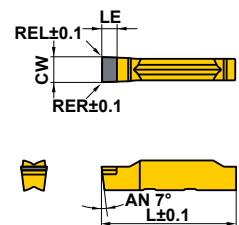
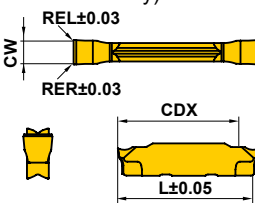
Applications	Geometry	Order Number	Stock							Seat Size	Dimensions (mm)						
			Coated			Cermet		Carbide			CW		RER/L	CDX	*2		
			NEW	MP9015	MP9025	VP10RT	VP20RT	MY5015	NX2525		RT9010	RT9020				Cutting Width	Tolerance
			MP9015	MP9025	VP10RT	VP20RT	MY5015	NX2525	RT9010		RT9020	L					
For Grooving / Cutting Off	<b>GU Breaker</b> (For gummy steel) 	GY2M0200D020N-GU				●	●	●				D	2.00	±0.03	0.2	19.7	20.70
		GY2M0239E020N-GU				●	●	●				E	2.39	±0.03	0.2	19.8	20.70
		GY2M0250E020N-GU				●	●	●				E	2.50	±0.03	0.2	19.5	20.70
		GY2M0300F030N-GU				●	●	●				F	3.00	±0.03	0.3	19.3	20.70
		GY2M0318F030N-GU				●	●	●				F	3.18	±0.03	0.3	19.3	20.70
		GY2M0400G030N-GU				●	●	●				G	4.00	±0.04	0.3	24.2	25.65
		GY2M0475H040N-GU				●	●	●				H	4.75	±0.04	0.4	24.2	25.65
		GY2M0500H040N-GU				●	●	●				H	5.00	±0.04	0.4	24.2	25.65
		GY2M0600J040N-GU				●	●	●				J	6.00	±0.04	0.4	24.2	25.65
		GY2M0635J040N-GU				●	●	●				J	6.35	±0.04	0.4	24.2	25.65
	<b>GS Breaker</b> (Low feeds) 	GY2M0150C010N-GS				●	●	●				C	1.50	±0.03	0.1	13.4	14.70
		GY2M0200D020N-GS				●	●	●				D	2.00	±0.03	0.2	18.7	20.70
		GY2M0239E020N-GS				●	●	●				E	2.39	±0.03	0.2	18.5	20.70
		GY2M0250E020N-GS				●	●	●				E	2.50	±0.03	0.2	18.5	20.70
		GY2M0300F020N-GS				●	●	●				F	3.00	±0.03	0.2	18.5	20.70
		GY2M0318F020N-GS				●	●	●				F	3.18	±0.03	0.2	18.5	20.70
		GY2M0400G020N-GS				●	●	●				G	4.00	±0.04	0.2	23.9	25.65
		GY2M0475H030N-GS				●	●	●				H	4.75	±0.04	0.3	23.9	25.65
		GY2M0500H030N-GS				●	●	●				H	5.00	±0.04	0.3	24.0	25.65
		GY2M0600J030N-GS				●	●	●				J	6.00	±0.04	0.3	24.1	25.65
	GY2M0635J030N-GS				●	●	●				J	6.35	±0.04	0.3	24.1	25.65	
	GY2M0800K030N-GS				●	●	●				K	8.00	±0.04	0.3	29.1	30.50	
	<b>GM Breaker</b> (Medium feeds) 	GY1M0200D020N-GM	●	●	●	●	●					D	2.00	±0.03	0.2	—	20.70
		GY1M0250E020N-GM	●	●	●	●	★					E	2.50	±0.03	0.2	—	20.70
		GY1M0300F030N-GM	●	●	●	●	●					F	3.00	±0.03	0.3	—	20.70
		GY1M0400G030N-GM	●	●	●	●	●					G	4.00	±0.04	0.3	—	25.65
		GY1M0500H040N-GM	●	●	●	●	●					H	5.00	±0.04	0.4	—	25.65
	<b>GM Breaker</b> (Medium feeds) 	GY2M0150C020N-GM	●	●	●	●	●					C	1.50	±0.03	0.2	13.9	14.70
GY2M0200D020N-GM		●	●	●	●	●					D	2.00	±0.03	0.2	19.4	20.70	
GY2M0239E020N-GM		●	●	●	●	●					E	2.39	±0.03	0.2	19.4	20.70	
GY2M0250E020N-GM		●	●	●	●	●					E	2.50	±0.03	0.2	19.4	20.70	
GY2M0300F030N-GM		●	●	●	●	●					F	3.00	±0.03	0.3	19.4	20.70	
GY2M0318F030N-GM		●	●	●	●	●					F	3.18	±0.03	0.3	19.4	20.70	
GY2M0400G030N-GM		●	●	●	●	●					G	4.00	±0.04	0.3	24.4	25.65	
GY2M0475H040N-GM		●	●	●	●	●					H	4.75	±0.04	0.4	24.3	25.65	
GY2M0500H040N-GM		●	●	●	●	●					H	5.00	±0.04	0.4	24.3	25.65	
GY2M0600J040N-GM		●	●	●	●	●					J	6.00	±0.04	0.4	24.3	25.65	
GY2M0635J040N-GM	●	●	●	●	●					J	6.35	±0.04	0.4	24.3	25.65		
GY2M0800K050N-GM	●	●	●	●	●					K	8.00	±0.04	0.5	29.3	30.50		
For Cutting off	<b>R/L05-GM Breaker</b>  Right hand insert shown.	GY1M0200D020R05-GM				●	●					D	2.00	±0.03	0.2	—	20.80
		GY1M0200D020L05-GM				★	●					D	2.00	±0.03	0.2	—	20.80
		GY1M0300F030R05-GM				●	●					F	3.00	±0.03	0.3	—	20.85
		GY1M0300F030L05-GM				●	●					F	3.00	±0.03	0.3	—	20.85

\*2 The dimension depends on the breaker. Refer to the F017 "L dimension tolerance conversion table".

● : Inventory maintained. ★ : Inventory maintained in Japan.

(10 inserts in one case) (CBN inserts are available in 1 piece in one case.)

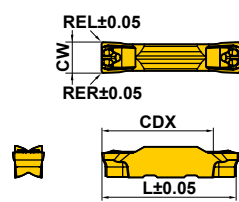
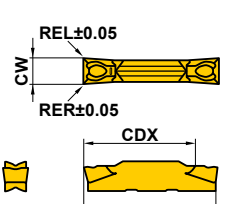
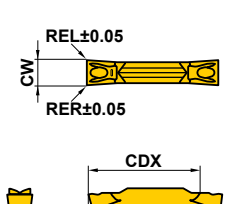


Applications	Geometry	Order Number	Stock						Seat Size	Dimensions (mm)							
			Coated			Carbide CBN				CW		RER/L	CDX	L	*2	LE	
			NEW	VP10RT	VP20RT	RT9010	BC8110	Cutting Width		Tolerance							
			MP9015	MP9025													
For Cutting Off	<b>R/L05-GM Breaker</b>  Right hand insert shown.	GY2M0200D020R05-GM			●	●				D	2.00	±0.03	0.2	19.5	20.80	—	
		GY2M0200D020L05-GM			●	●				D	2.00	±0.03	0.2	19.5	20.80	—	
		GY2M0250E020R05-GM			●	●				E	2.50	±0.03	0.2	19.5	20.825	—	
		GY2M0250E020L05-GM			●	●				E	2.50	±0.03	0.2	19.5	20.825	—	
		GY2M0300F030R05-GM			●	●				F	3.00	±0.03	0.3	19.5	20.85	—	
		GY2M0300F030L05-GM			●	●				F	3.00	±0.03	0.3	19.5	20.85	—	
		GY2M0400G030R05-GM			●	●				G	4.00	±0.04	0.3	24.5	25.85	—	
		GY2M0400G030L05-GM			●	●				G	4.00	±0.04	0.3	24.5	25.85	—	
		GY2M0500H040R05-GM			●	●				H	5.00	±0.04	0.4	24.5	25.95	—	
		GY2M0500H040L05-GM			●	●				H	5.00	±0.04	0.4	24.5	25.95	—	
For Grooving	<b>Flat Top (For hardened steel)</b> 	GY1G0200D020N-GFGS							●	D	2.00	±0.03	0.2	—	20.70	2.7	
		GY1G0239E020N-GFGS								●	E	2.39	±0.03	0.2	—	20.70	2.7
		GY1G0250E020N-GFGS								●	E	2.50	±0.03	0.2	—	20.70	2.7
		GY1G0300F020N-GFGS								●	F	3.00	±0.03	0.2	—	20.70	2.7
		GY1G0318F020N-GFGS								●	F	3.18	±0.03	0.2	—	20.70	2.7
		GY1G0400G020N-GFGS								●	G	4.00	±0.03	0.2	—	25.65	2.7
		GY1G0475H020N-GFGS								●	H	4.75	±0.03	0.2	—	25.65	2.7
		GY1G0500H020N-GFGS								●	H	5.00	±0.03	0.2	—	25.65	2.7
		GY1G0600J020N-GFGS								●	J	6.00	±0.03	0.2	—	25.65	2.7
For Grooving / Cutting Off	<b>GL Breaker (For Aluminium Alloy)</b> 	GY2G0200D005N-GL							●	D	2.00	±0.02	0.05	19.5	21.05	—	
		GY2G0250E005N-GL								●	E	2.50	±0.02	0.05	19.1	21.05	—
		GY2G0300F005N-GL								●	F	3.00	±0.02	0.05	18.9	21.05	—

F  
GROOVING / CUTTING OFF

# GY SERIES INSERTS

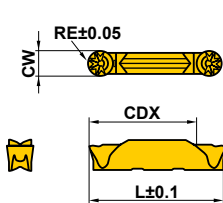
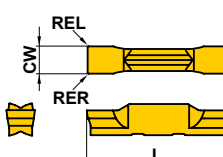
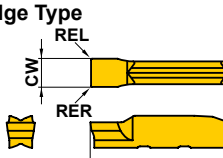
## INSERTS

Applications	Geometry	Order Number	Stock						Seat Size	Dimensions (mm)						
			Coated			Cermet	Carbide			CW		RE RER/L	CDX	*2		
			NEW	VP10RT	VP20RT	MY5015	NX2525	RT9010		RT9020	Cutting Width				Tolerance	
			MP9015	MP9025												
For Multifunctional Grooving	<b>MF Breaker</b> (Finishing) 	GY2G0200D020N-MF			●	●	●	●	D	2.00	±0.02	0.2	19.5	21.05		
		*1 GY2G0224D015N-MF			●	●	●	●	D	2.24	±0.02	0.15	19.8	21.05		
		GY2G0239E020N-MF			★	★	★	★	E	2.39	±0.02	0.2	19.2	21.05		
		GY2G0250E020N-MF			●	●	●	●	E	2.50	±0.02	0.2	19.4	21.05		
		*1 GY2G0274E020N-MF			●	●	●	●	E	2.74	±0.02	0.2	19.7	21.05		
		GY2G0300F020N-MF			●	●	●	●	F	3.00	±0.02	0.2	19.5	21.05		
		GY2G0300F040N-MF			●	●	●	●	F	3.00	±0.02	0.4	19.3	21.05		
		GY2G0318F020N-MF			★	★	★	★	F	3.18	±0.02	0.2	19.5	21.05		
		GY2G0318F040N-MF			★	★	★	★	F	3.18	±0.02	0.4	19.3	21.05		
		*1 GY2G0324F020N-MF			●	●	●	●	F	3.24	±0.02	0.2	19.5	21.05		
		GY2G0400G020N-MF			●	●	●	●	G	4.00	±0.02	0.2	24.9	25.95		
		GY2G0400G040N-MF			●	●	●	●	G	4.00	±0.02	0.4	24.7	25.95		
		GY2G0400G080N-MF			●	●	●	●	G	4.00	±0.02	0.8	24.3	25.95		
		*1 GY2G0424G020N-MF			●	●	●	●	G	4.24	±0.02	0.2	24.9	25.95		
		GY2G0475H020N-MF			★	★	★	★	H	4.75	±0.02	0.2	24.4	25.95		
		GY2G0475H040N-MF			★	★	★	★	H	4.75	±0.02	0.4	24.2	25.95		
		GY2G0475H080N-MF			★	★	★	★	H	4.75	±0.02	0.8	23.8	25.95		
		GY2G0500H020N-MF			●	●	●	●	H	5.00	±0.02	0.2	24.4	25.95		
		GY2G0500H040N-MF			●	●	●	●	H	5.00	±0.02	0.4	24.2	25.95		
		GY2G0500H080N-MF			●	●	●	●	H	5.00	±0.02	0.8	23.8	25.95		
		*1 GY2G0524H020N-MF			●	●	●	●	H	5.24	±0.02	0.2	24.4	25.95		
		GY2G0600J020N-MF			●	●	●	●	J	6.00	±0.02	0.2	24.4	25.95		
		GY2G0600J040N-MF			●	●	●	●	J	6.00	±0.02	0.4	24.2	25.95		
		GY2G0600J080N-MF			●	●	●	●	J	6.00	±0.02	0.8	23.8	25.95		
		*1 GY2G0631J020N-MF			●	●	●	●	J	6.31	±0.02	0.2	24.4	25.95		
		GY2G0635J020N-MF			★	★	★	★	J	6.35	±0.02	0.2	24.4	25.95		
		GY2G0635J040N-MF			★	★	★	★	J	6.35	±0.02	0.4	24.2	25.95		
		GY2G0635J080N-MF			★	★	★	★	J	6.35	±0.02	0.8	23.8	25.95		
		For Multifunctional Grooving	<b>MS Breaker</b> (Low feeds) 	GY2M0200D020N-MS			●	●	●	●	D	2.00	±0.03	0.2	19.1	20.70
				GY2M0250E020N-MS			●	●	●	●	E	2.50	±0.03	0.2	19.1	20.70
GY2M0300F020N-MS					●	●	●	●	F	3.00	±0.03	0.2	19.2	20.70		
GY2M0300F040N-MS					●	●	●	●	F	3.00	±0.03	0.4	18.9	20.70		
GY2M0400G020N-MS					●	●	●	●	G	4.00	±0.04	0.2	24.2	25.65		
GY2M0400G040N-MS					●	●	●	●	G	4.00	±0.04	0.4	23.9	25.65		
GY2M0500H040N-MS					●	●	●	●	H	5.00	±0.04	0.4	23.9	25.65		
GY2M0500H080N-MS					●	●	●	●	H	5.00	±0.04	0.8	23.5	25.65		
GY2M0600J040N-MS					●	●	●	●	J	6.00	±0.04	0.4	23.9	25.65		
GY2M0600J080N-MS					●	●	●	●	J	6.00	±0.04	0.8	23.5	25.65		
GY2M0800K080N-MS			●	●	●	●	K	8.00	±0.04	0.8	28.5	30.50				
For Multifunctional Grooving	<b>MM Breaker</b> (Medium feeds) 	GY2M0200D020N-MM	●	●	●	●	●	●	D	2.00	±0.03	0.2	19.1	20.70		
		GY2M0250E020N-MM	●	●	●	●	●	●	●	E	2.50	±0.03	0.2	19.1	20.70	
		GY2M0300F020N-MM	●	●	●	●	●	●	●	F	3.00	±0.03	0.2	19.1	20.70	
		GY2M0300F040N-MM	●	●	●	●	●	●	●	F	3.00	±0.03	0.4	18.9	20.70	
		GY2M0300F080N-MM	●	●	●	●	●	●	●	F	3.00	±0.03	0.8	18.5	20.70	
		GY2M0400G020N-MM	●	●	●	●	●	●	●	G	4.00	±0.04	0.2	24.1	25.65	
		GY2M0400G040N-MM	●	●	●	●	●	●	●	G	4.00	±0.04	0.4	23.9	25.65	
		GY2M0400G080N-MM	●	●	●	●	●	●	●	G	4.00	±0.04	0.8	23.5	25.65	
		GY2M0500H040N-MM	●	●	●	●	●	●	●	H	5.00	±0.04	0.4	23.9	25.65	
		GY2M0500H080N-MM	●	●	●	●	●	●	●	H	5.00	±0.04	0.8	23.5	25.65	
		GY2M0600J040N-MM	●	●	●	●	●	●	●	J	6.00	±0.04	0.4	23.9	25.65	
		GY2M0600J080N-MM	●	●	●	●	●	●	●	J	6.00	±0.04	0.8	23.5	25.65	
		GY2M0800K080N-MM	●	●	●	●	●	●	●	K	8.00	±0.04	0.8	28.5	30.50	
GY2M0800K120N-MM	●	●	●	●	●	●	●	K	8.00	±0.04	1.2	28.1	30.50			

\*1 Groove width corresponding to the circlip.

\*2 The dimension depends on the breaker. Refer to the F017 "L dimension tolerance conversion table".

● : Inventory maintained. ★ : Inventory maintained in Japan.

Applications	Geometry	Order Number	Stock							Seat Size	Dimensions (mm)						
			Coated			Cermet		Carbide			CW		RE RER/L	CDX	*2 L		
			NEW MP9015	MP9025	VP10RT	VP20RT	MY5015	NX2525	RT9010		RT9020	Cutting Width				Tolerance	
			●	●	●	●	●	●	●		●						
For Copying / For Recessing	<b>BM Breaker</b> 	GY2M0200D100N-BM	●	●	●	●	●	●			D	2.00	±0.03	1.00	19.5	20.90	
		GY2M0250E125N-BM	●	●	●	●	●	●	●			E	2.50	±0.03	1.25	19.3	20.90
		GY2M0300F150N-BM	●	●	●	●	●	●	●			F	3.00	±0.03	1.50	19.0	20.90
		GY2M0318F159N-BM	●	●	●	●	●	●	●			F	3.18	±0.03	1.59	18.9	20.90
		GY2M0400G200N-BM	●	●	●	●	●	●	●			G	4.00	±0.04	2.00	23.4	25.80
		GY2M0475H238N-BM	●	●	●	●	●	●	●			H	4.75	±0.04	2.38	22.9	25.80
		GY2M0500H250N-BM	●	●	●	●	●	●	●			H	5.00	±0.04	2.50	22.8	25.80
		GY2M0600J300N-BM	●	●	●	●	●	●	●			J	6.00	±0.04	3.00	22.5	25.90
		GY2M0635J318N-BM	●	●	●	●	●	●	●			J	6.35	±0.04	3.18	22.3	25.90
		GY2M0800K400N-BM	●	●	●	●	●	●	●			K	8.00	±0.04	4.00	26.5	30.80
*1 Blank	<b>2 Edge Type</b> 	GY2B0220D020N						●	●	●	D	2.20	±0.10	0.2	—	21.05	
		NEW GY2B0250D020N						●	●	●	D	2.55	±0.10	0.2	—	21.28	
		GY2B0270E020N						●	●	●	E	2.70	±0.10	0.2	—	21.05	
		NEW GY2B0300E020N						●	●	●	E	3.05	±0.10	0.2	—	21.28	
		GY2B0340F020N						●	●	●	F	3.40	±0.10	0.2	—	21.05	
		NEW GY2B0360F020N						●	●	●	F	3.65	±0.10	0.2	—	21.28	
		GY2B0420G020N						●	●	●	G	4.20	±0.10	0.2	—	26.00	
		NEW GY2B0460G020N						●	●	●	G	4.65	±0.10	0.2	—	26.18	
		GY2B0520H020N						●	●	●	H	5.20	±0.10	0.2	—	26.00	
		NEW GY2B0560H020N						●	●	●	H	5.65	±0.10	0.2	—	26.18	
		GY2B0655J020N						●	●	●	J	6.55	±0.10	0.2	—	26.03	
		NEW GY2B0680J020N						●	●	●	J	6.85	±0.10	0.2	—	26.18	
	NEW GY2B0880K020N							●	●	●	K	8.85	±0.10	0.2	—	30.88	
	<b>1 Edge Type</b> 	GY1B0220D020N						●	●	●	D	2.20	±0.10	0.2	—	21.07	
		GY1B0270E020N						●	●	●	E	2.70	±0.10	0.2	—	21.10	
		GY1B0340F020N						●	●	●	F	3.40	±0.10	0.2	—	21.00	
		GY1B0420G020N						●	●	●	G	4.20	±0.10	0.2	—	25.86	
		GY1B0520H020N						●	●	●	H	5.20	±0.10	0.2	—	25.90	
		GY1B0655J020N						●	●	●	J	6.55	±0.10	0.2	—	25.90	

\*1 Groove width corresponding to the circlip.

\*2 The dimension depends on the breaker. Refer to the F017 "L dimension tolerance conversion table".




T

GROOVING / CUTTING OFF

# GROOVING / CUTTING OFF

## Reference Material

### C-TYPE CIRCLIP STANDARDS LIST

Category	Application		Standard	Width (Tolerance)										
				For shaft				For hole						
 C-type stop ring	For shaft	For hole		0.5	+0.14 0	0.305	+0.051	1.15	+0.14 0	9	+0.14 0	0.457	+0.051	
				0.7		0.457	0	1.35				1.1	0.737	+0.076
				0.8		0.737		1.75				1.3	0.991	0
				0.9		0.991	+0.076	1.95				1.6	1.168	0
				1.1		1.168	0	2.2				1.85	1.422	+0.102
				1.3		1.422	+0.102	2.7				2.15	1.727	0
				1.6		1.727	0	3.2		+0.18		2.65	1.727	0
				1.85		2.184	+0.127	4.2		0		3.15	2.184	+0.127
				2.15		2.616	0					4.15	2.616	0
				2.65		3.048	0					5.15	3.048	0
 C-type concentric stop ring	For shaft	For hole	ANSI B27.7/27.8 (US) BS 3673 (UK) DIN 471/472 (De) NF E 22 163 (Fr) UNI 7435/7438 (It)	3.15	+0.18 0	3.531	+0.152		+0.18 0	6.2	+0.22 0			
				4.15										
				5.15										
				6.2										
 E-type stop ring	For shaft		N1*** American	0.32	+0.05	0.305	+0.051	0.3	+0.05					
				0.5	0	0.457	0	0.4	0					
				0.7	+0.10	0.584		0.5						
				1.0	0	0.737	+0.076	0.7	+0.10					
				1.2	+0.14	0.991	0	0.9	0					
				1.4	0	1.168		1.15						
		1.422	+0.102	1.75	+0.14									
		1.727	0	2.2	0									

F

GROOVING / CUTTING OFF

### O-RING STANDARDS

Category	Standard	Width (Tolerance)						
		General		For oil pressure		For air pressure		
For stable	DIN 3770/3771 (De)	2.54	+0.13 0	1.9	+0.1			
		3.18		2.3	0	2.3		
		4.32						
For stable	JIS B 2401 (JP) ISO 3601	6.1	+0.14 0	2.9	+0.15	3.1	+0.2 0	
		8.0						
		3.2		2.5	3.7			
For stable	SMS 1586/1588 (Se) BS 1806/4518 (UK)	4.0	+0.2	4.5	0	6.4		
		7.5	0	5.5	+0.3	9.0		
		11.0		7.0	0	2.4	+0.25 0	
For dynamic	SAE AS-568 (US)	2.39	+0.25 0	8.6	+0.4	3.6		+0.2 0
		3.58						
		4.78			4.8		2.2	
7.14		10.7	+0.5	7.1				
9.58			0	9.5				
						3.4		
						4.6		
						6.9		
						9.3		

- G-class insert with MF breaker is available for single-step machining.
- Conventional GY series insert is available for single-step machining.
- Machined in multiple steps or by cross feed machining.

## L DIMENSION TOLERANCE CONVERSION TABLE

Cutting Width CW (mm)	*1 Dimensions L (mm)	*2 Dimensional tolerance (mm) versus standard dimension (L) of each breaker						
		GU	GS/GM	MS/MM	R/L-GM	Flat Top	MF	BM
1.50	14.70		0					
2.00	20.70	0	0	0	0.10	0	0.35	0.20
2.24	*3 (20.7)						0.35	
2.39	20.70	0	0			0	0.35	
2.50	20.70	0	0	0	0.125	0	0.35	0.20
2.74	*3 (20.7)						0.35	
3.00	20.70	0	0	0	0.15	0	0.35	0.20
3.18	20.70	0	0			0	0.35	0.20
3.24	*3 (20.7)						0.35	
4.00	25.65	0	0	0	0.20	0	0.30	0.15
4.24	*3 (25.65)						0.30	
4.75	25.65	0	0			0	0.30	0.15
5.00	25.65	0	0	0	0.30	0	0.30	0.15
5.24	*3 (25.65)						0.30	
6.00	25.65	0	0	0		0	0.30	0.25
6.31	*3 (25.65)						0.30	
6.35	25.65	0	0				0.30	0.25
8.00	30.50		0	0				0.30

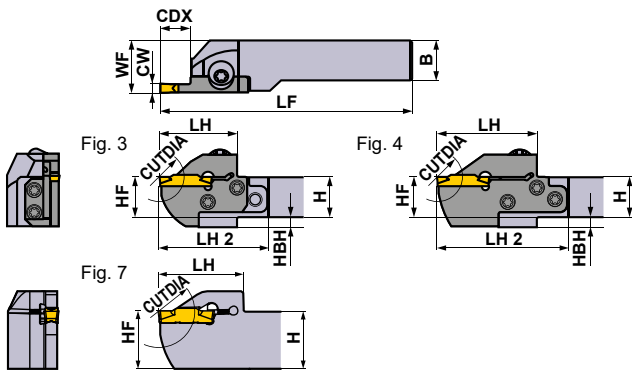
\*1 This value is used at the described holder dimension.

\*2  when there is no applicable breaker.

\*3 The standard dimensions shown here use an approximate insert width.



\* Wrench : ① : Clamp Screw, ② : Blade Screw



Right hand tool holder shown.

### SPARE PARTS

Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench *
GYQR/L	HSC05020 (Clamp Torque : 7.0N·m)	—	HKY40R
GYHR/L	GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
GYHR/L			TS55 (Clamp Torque : 5.0N·m)

Dimensions (mm) *3									Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH		Clockwise	Anticlockwise
16	16	104	28	44	16	20	4		R	
16	16	104	28	44	16	20	4			
20	20	125	36	—	20	20.15	—			
20	20	125	36	—	20	20.15	—			
20	20	119	28	43	20	23	—			
20	20	119	28	43	20	23	—			
20	20	117	31	52	20	26	5			
20	20	117	31	52	20	26	5			
25	25	150	36	—	25	25.15	—			
25	25	150	36	—	25	25.15	—			
25	25	142	31	49	25	28	—			
25	25	142	31	49	25	28	—			
32	25	162	31	49	32	28	—			
32	25	162	31	49	32	28	—			
32	32	162	31	49	32	35	—			
32	32	162	31	49	32	35	—			
16	16	110	34	50	16	20	4		L	
16	16	110	34	50	16	20	4			
20	20	125	34	49	20	23	—			
20	20	125	34	49	20	23	—			
20	20	125	39	60	20	26	5			
20	20	125	39	60	20	26	5			
25	25	150	39	57	25	28	—			
25	25	150	39	57	25	28	—			
32	25	170	39	57	32	28	—			
32	25	170	39	57	32	28	—			
32	32	170	39	57	32	35	—			
32	32	170	39	57	32	35	—			
16	16	116	40	56	16	20	4			
16	16	116	40	56	16	20	4			
20	20	125	39	—	20	20.1	—			
20	20	125	39	—	20	20.1	—			
20	20	131	40	55	20	23	—			
20	20	131	40	55	20	23	—			
20	20	131	45	66	20	26	5			
20	20	131	45	66	20	26	5			
25	25	150	41	—	25	25.1	—			
25	25	150	41	—	25	25.1	—			
25	25	156	45	63	25	28	—			
25	25	156	45	63	25	28	—			
32	25	176	45	63	32	28	—			
32	25	176	45	63	32	28	—			
32	32	176	45	63	32	35	—			
32	32	176	45	63	32	35	—			

### Insert selection

Seat Size	Geometry name
D	GY000200/0224D0000-Breaker shown below

For grooving/cutting off breaker > F012, F013						
Seat Size	Breaker	GU	GS	GM	GL	GFGS
		(For gummy steel)	(Low)	(Medium)	(Aluminium alloy)	(Hardened steel)
CW		Neutral	Neutral	Neutral	Neutral	With hand
D	2.00mm	●	●	●	●	●

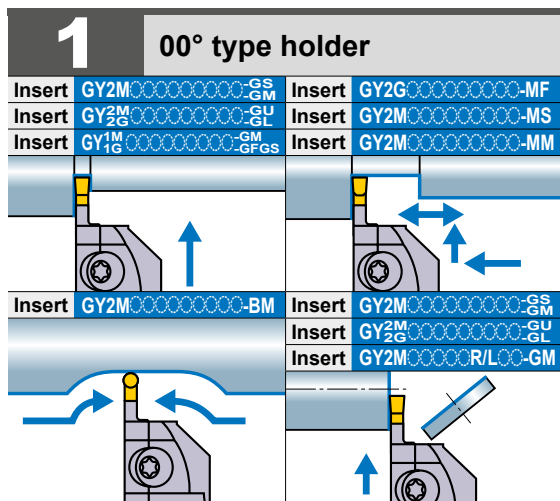
For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying, Recessing)
CW					Ball shape
D	2.00mm	●	●	●	●
	2.24mm	●			

● : Standard insert with dimensions

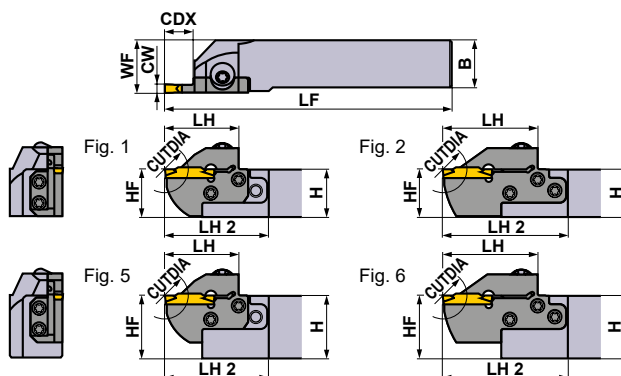
GROOVING / CUTTING OFF

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F096  
 CAUTION FOR USE > F100

# GY SERIES (EXTERNAL)



Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number				Fig.
	CW	CDX	CUTDIA			Holder	Stock	Modular Blade	Stock	
E	2.39 2.50 2.74	6	12	Modular	R	GYHR1616J00-M20R	●	GYM20RA-E06	●	3
				Modular	L	GYHL1616J00-M20L	●	GYM20LA-E06	●	3
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-E06	●	1
				Modular	L	GYHL2020K00-M20L	●	GYM20LA-E06	●	1
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-E06	●	3
				Modular	L	GYHL2020K00-M25L	●	GYM25LA-E06	●	3
		Modular	R	GYHR2525M00-M25R	●	GYM25RA-E06	●	1		
		Modular	L	GYHL2525M00-M25L	●	GYM25LA-E06	●	1		
		Modular	R	GYHR3225P00-M25R	●	GYM25RA-E06	●	5		
		Modular	L	GYHL3225P00-M25L	●	GYM25LA-E06	●	5		
		Modular	R	GYHR3232P00-M25R	●	GYM25RA-E06	●	5		
		Modular	L	GYHL3232P00-M25L	●	GYM25LA-E06	●	5		
	Modular	R	GYHR1616J00-M20R	●	GYM20RA-E10	●	3			
	Modular	L	GYHL1616J00-M20L	●	GYM20LA-E10	●	3			
	Modular	R	GYHR2020K00-M20R	●	GYM20RA-E10	●	1			
	Modular	L	GYHL2020K00-M20L	●	GYM20LA-E10	●	1			
	Modular	R	GYHR2020K00-M25R	●	GYM25RA-E12	●	3			
	Modular	L	GYHL2020K00-M25L	●	GYM25LA-E12	●	3			
	Modular	R	GYHR2525M00-M25R	●	GYM25RA-E12	●	1			
	Modular	L	GYHL2525M00-M25L	●	GYM25LA-E12	●	1			
	Modular	R	GYHR3225P00-M25R	●	GYM25RA-E12	●	5			
	Modular	L	GYHL3225P00-M25L	●	GYM25LA-E12	●	5			
	Modular	R	GYHR3232P00-M25R	●	GYM25RA-E12	●	5			
	Modular	L	GYHL3232P00-M25L	●	GYM25LA-E12	●	5			
Modular	R	GYHR1616J00-M20R	●	GYM20RB-E18	●	4				
Modular	L	GYHL1616J00-M20L	●	GYM20LB-E18	●	4				
Modular	R	GYHR2020K00-M20R	●	GYM20RB-E18	●	2				
Modular	L	GYHL2020K00-M20L	●	GYM20LB-E18	●	2				
Modular	R	GYHR2020K00-M25R	●	GYM25RA-E20	●	4				
Modular	L	GYHL2020K00-M25L	●	GYM25LA-E20	●	4				
Modular	R	GYHR2525M00-M25R	●	GYM25RA-E20	●	2				
Modular	L	GYHL2525M00-M25L	●	GYM25LA-E20	●	2				
Modular	R	GYHR3225P00-M25R	●	GYM25RA-E20	●	6				
Modular	L	GYHL3225P00-M25L	●	GYM25LA-E20	●	6				
Modular	R	GYHR3232P00-M25R	●	GYM25RA-E20	●	6				
Modular	L	GYHL3232P00-M25L	●	GYM25LA-E20	●	6				

\*1 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012–F015.

\*2 The maximum cut off diameter (CUTDIA) varies according to the insert used.

The cut off diameter is double the maximum groove depth (CDX) of inserts on pages F012–F015.

\*3 Dimensions shown are when the standard insert is used. If other insert geometries are used then LF, LH, LH2 and WF values may vary.

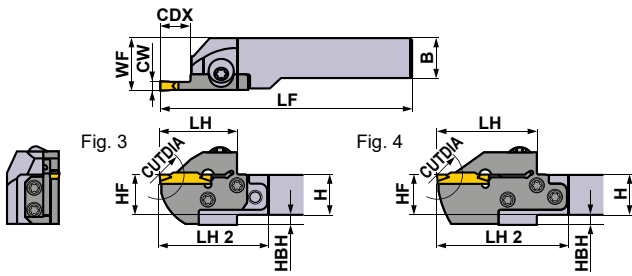
\*4 The maximum groove depth (CDX) is limited by the workpiece diameter. For details, please refer to page F098.

● : Inventory maintained.





\* Wrench : ① : Clamp Screw, ② : Blade Screw



Right hand tool holder shown.

SPARE PARTS			
Holder		5 pcs.	① ②
	Clamp Screw	Blade Screw	Wrench *
GYQR/L	HSC05020 (Clamp Torque : 7.0N·m)	—	HKY40R
GYHR/L	GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
GYHR/L			TS55 (Clamp Torque : 5.0N·m)

Dimensions (mm) *3									Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH		Clockwise	Anticlockwise
16	16	104	28	44	16	20	4	<b>R</b>		
16	16	104	28	44	16	20	4			
20	20	119	28	43	20	23	—			
20	20	119	28	43	20	23	—			
20	20	117	31	52	20	26	5			
20	20	117	31	52	20	26	5			
25	25	142	31	49	25	28	—			
25	25	142	31	49	25	28	—			
32	25	162	31	49	32	28	—			
32	25	162	31	49	32	28	—			
32	32	162	31	49	32	35	—			
32	32	162	31	49	32	35	—			
16	16	110	34	50	16	20	4	<b>L</b>		
16	16	110	34	50	16	20	4			
20	20	125	34	49	20	23	—			
20	20	125	34	49	20	23	—			
20	20	125	39	60	20	26	5			
20	20	125	39	60	20	26	5			
25	25	150	39	57	25	28	—			
25	25	150	39	57	25	28	—			
32	25	170	39	57	32	28	—			
32	25	170	39	57	32	28	—			
32	32	170	39	57	32	35	—			
32	32	170	39	57	32	35	—			
16	16	116	40	56	16	20	4	<b>L</b>		
16	16	116	40	56	16	20	4			
20	20	131	40	55	20	23	—			
20	20	131	40	55	20	23	—			
20	20	131	45	66	20	26	5			
20	20	131	45	66	20	26	5			
25	25	156	45	63	25	28	—			
25	25	156	45	63	25	28	—			
32	25	176	45	63	32	28	—			
32	25	176	45	63	32	28	—			
32	32	176	45	63	32	35	—			
32	32	176	45	63	32	35	—			

Insert selection

Seat Size	Geometry name
E	GY0239/0250/0274E—Breaker shown below

For grooving/cutting off breaker > F012, F013							
Seat Size	Breaker	GU	GS	GM	GL	GFGS	
		(For gummy steel)	(Low)	(Medium)	(Aluminium alloy)	(Cutting off)	(Hardened steel)
CW		Neutral	Neutral	Neutral	Neutral	With hand	Neutral
	2.39mm	●	●	●	●	●	●
E	2.50mm	●	●	●	●	●	●

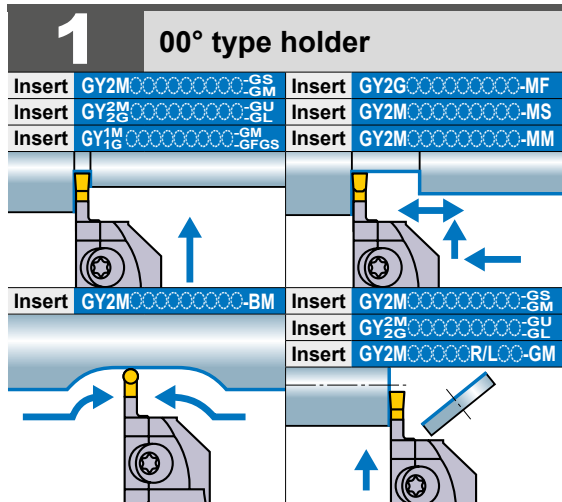
For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying, Recessing)
CW					Ball shape
	2.39mm	●			
	2.50mm	●	●	●	●
E	2.74mm	●			

● : Standard insert with dimensions

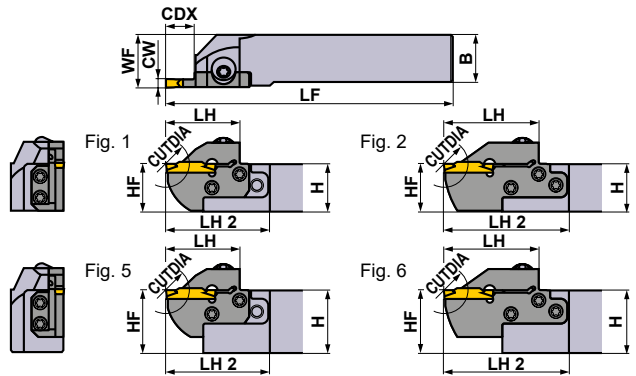
GROOVING / CUTTING OFF

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F096  
 CAUTION FOR USE > F100

# GY SERIES (EXTERNAL)



Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



Right hand tool holder shown.

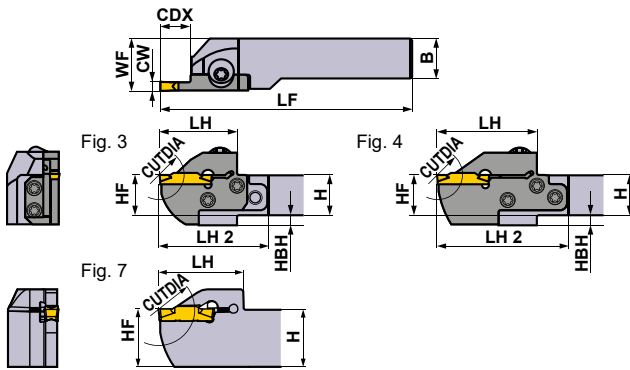
Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number				Fig.
	CW	CDX	CUTDIA			Holder	Stock	Modular Blade	Stock	
F	3.00 3.18 3.24	6	12	Modular	R	GYHR1616J00-M20R	●	GYM20RA-F06	●	3
				Modular	L	GYHL1616J00-M20L	●	GYM20LA-F06	●	3
				Monoblock	R	GYQR2020K00-F06	●	—	—	7
				Monoblock	L	GYQL2020K00-F06	●	—	—	7
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-F06	●	1
				Modular	L	GYHL2020K00-M20L	●	GYM20LA-F06	●	1
		Modular	R	GYHR2020K00-M25R	●	GYM25RA-F06	●	3		
		Modular	L	GYHL2020K00-M25L	●	GYM25LA-F06	●	3		
		Monoblock	R	GYQR2525M00-F06	●	—	—	7		
		Monoblock	L	GYQL2525M00-F06	●	—	—	7		
		Modular	R	GYHR2525M00-M25R	●	GYM25RA-F06	●	1		
		Modular	L	GYHL2525M00-M25L	●	GYM25LA-F06	●	1		
	Modular	R	GYHR3225P00-M25R	●	GYM25RA-F06	●	5			
	Modular	L	GYHL3225P00-M25L	●	GYM25LA-F06	●	5			
	Modular	R	GYHR3232P00-M25R	●	GYM25RA-F06	●	5			
	Modular	L	GYHL3232P00-M25L	●	GYM25LA-F06	●	5			
	10	20	Modular	R	GYHR1616J00-M20R	●	GYM20RA-F10	●	3	
			Modular	L	GYHL1616J00-M20L	●	GYM20LA-F10	●	3	
		Modular	R	GYHR2020K00-M20R	●	GYM20RA-F10	●	1		
		Modular	L	GYHL2020K00-M20L	●	GYM20LA-F10	●	1		
		24	Modular	R	GYHR2020K00-M25R	●	GYM25RA-F12	●	3	
			Modular	L	GYHL2020K00-M25L	●	GYM25LA-F12	●	3	
	Modular		R	GYHR2525M00-M25R	●	GYM25RA-F12	●	1		
	Modular		L	GYHL2525M00-M25L	●	GYM25LA-F12	●	1		
18 *4	36	Modular	R	GYHR3225P00-M25R	●	GYM25RA-F12	●	5		
		Modular	L	GYHL3225P00-M25L	●	GYM25LA-F12	●	5		
	Modular	R	GYHR3232P00-M25R	●	GYM25RA-F12	●	5			
	Modular	L	GYHL3232P00-M25L	●	GYM25LA-F12	●	5			
20 *1	40 *2	Modular	R	GYHR1616J00-M20R	●	GYM20RB-F18	●	4		
		Modular	L	GYHL1616J00-M20L	●	GYM20LB-F18	●	4		
		Monoblock	R	GYQR2020K00-F18	●	—	—	7		
		Monoblock	L	GYQL2020K00-F18	●	—	—	7		
	Modular	R	GYHR2020K00-M20R	●	GYM20RB-F18	●	2			
	Modular	L	GYHL2020K00-M20L	●	GYM20LB-F18	●	2			
	Modular	R	GYHR2020K00-M25R	●	GYM25RA-F20	●	4			
	Modular	L	GYHL2020K00-M25L	●	GYM25LA-F20	●	4			
	Monoblock	R	GYQR2525M00-F20	●	—	—	7			
	Monoblock	L	GYQL2525M00-F20	●	—	—	7			
Modular	R	GYHR2525M00-M25R	●	GYM25RA-F20	●	2				
Modular	L	GYHL2525M00-M25L	●	GYM25LA-F20	●	2				
Modular	R	GYHR3225P00-M25R	●	GYM25RA-F20	●	6				
Modular	L	GYHL3225P00-M25L	●	GYM25LA-F20	●	6				
Modular	R	GYHR3232P00-M25R	●	GYM25RA-F20	●	6				
Modular	L	GYHL3232P00-M25L	●	GYM25LA-F20	●	6				

\*1 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.  
 \*2 The maximum cut off diameter (CUTDIA) varies according to the insert used.  
 The cut off diameter is double the maximum groove depth (CDX) of inserts on pages F012—F015.  
 \*3 Dimensions shown are when the standard insert is used. If other insert geometries are used then LF, LH, LH2 and WF values may vary.  
 \*4 The maximum groove depth (CDX) is limited by the workpiece diameter. For details, please refer to page F098.

● : Inventory maintained.

GROOVING / CUTTING OFF

\* Wrench : ① : Clamp Screw, ② : Blade Screw



Right hand tool holder shown.

### SPARE PARTS

Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench *
GYQR/L	HSC05020 (Clamp Torque : 7.0N·m)	—	HKY40R
GYHR/L	GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
GYHR/L			TS55 (Clamp Torque : 5.0N·m)

Dimensions (mm) *3									Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH		Clockwise	Anticlockwise
16	16	104	28	44	16	20	4	<b>R</b>		
16	16	104	28	44	16	20	4			
20	20	125	36	—	20	20.3	—			
20	20	125	36	—	20	20.3	—			
20	20	119	28	43	20	23	—			
20	20	119	28	43	20	23	—			
20	20	117	31	52	20	26	5			
20	20	117	31	52	20	26	5			
25	25	150	36	—	25	25.3	—			
25	25	150	36	—	25	25.3	—			
25	25	142	31	49	25	28	—	<b>L</b>		
25	25	142	31	49	25	28	—			
32	25	162	31	49	32	28	—			
32	25	162	31	49	32	28	—			
32	32	162	31	49	32	35	—			
32	32	162	31	49	32	35	—			
16	16	110	34	50	16	20	4			
16	16	110	34	50	16	20	4			
20	20	125	34	49	20	23	—			
20	20	125	34	49	20	23	—			
20	20	125	39	60	20	26	5			
20	20	125	39	60	20	26	5			
25	25	150	39	57	25	28	—			
25	25	150	39	57	25	28	—			
32	25	170	39	57	32	28	—			
32	25	170	39	57	32	28	—			
32	32	170	39	57	32	35	—			
32	32	170	39	57	32	35	—			
16	16	116	40	56	16	20	4			
16	16	116	40	56	16	20	4			
20	20	125	39	—	20	20.25	—			
20	20	125	39	—	20	20.25	—			
20	20	131	40	55	20	23	—			
20	20	131	40	55	20	23	—			
20	20	131	45	66	20	26	5			
20	20	131	45	66	20	26	5			
25	25	150	41	—	25	25.25	—			
25	25	150	41	—	25	25.25	—			
25	25	156	45	63	25	28	—			
25	25	156	45	63	25	28	—			
32	25	176	45	63	32	28	—			
32	25	176	45	63	32	28	—			
32	32	176	45	63	32	35	—			
32	32	176	45	63	32	35	—			

### Insert selection

Seat Size	Geometry name
F	GY0239/0250/0274E Breaker shown below

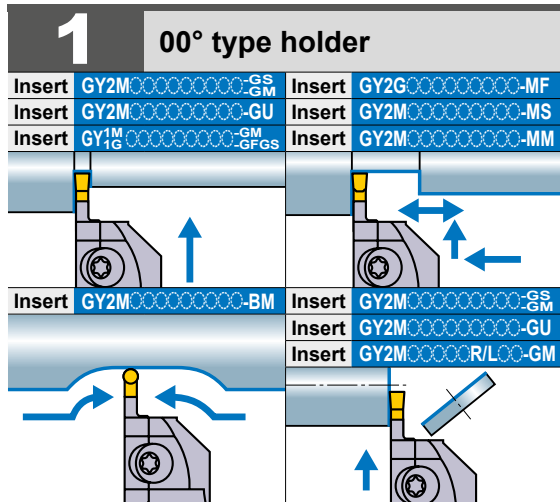
For grooving/cutting off breaker > F012, F013						
Seat Size	Breaker	GU	GS	GM	GL	GFGS
		(For gummy steel)	(Low)	(Medium)	(Aluminium alloy)	(Hardened steel)
F	CW	Neutral	Neutral	Neutral	Neutral	With hand
	F	3.00mm	●	●	●	●
		3.18mm	●	●	●	●

For multifunctional grooving breaker > F014, F015						
Seat Size	Breaker	MF	MS	MM	BM	
		(Finish)	(Low)	(Medium)	(Copying, Recessing)	
F	3.00mm				●	
		RE 0.2	●	●	●	
	RE 0.4	●	●	●		
	RE 0.8			●		
	3.18mm	RE 0.2	●			●
		RE 0.4	●			
	3.24mm					●

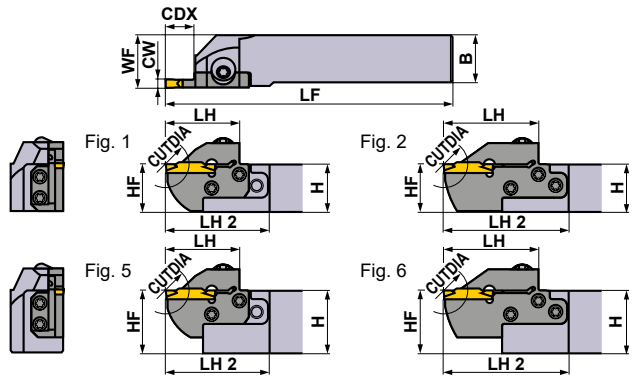
● : Standard insert with dimensions

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F096  
 CAUTION FOR USE > F100

# GY SERIES (EXTERNAL)



Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



Right hand tool holder shown.

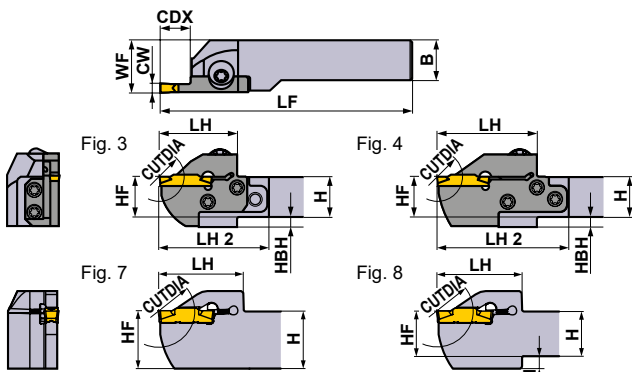
Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number				Fig.
	CW	CDX	CUTDIA			Holder	Stock	Modular Blade	Stock	
G	4.00 4.24	8	16	Monoblock	R	GYQR2020K00-G08	●	—	—	7
					L	GYQL2020K00-G08	●	—	—	7
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-G08	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-G08	●	3
				Monoblock	R	GYQR2525M00-G08	●	—	—	7
					L	GYQL2525M00-G08	●	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-G08	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-G08	●	1
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-G08	●	5
					L	GYHL3225P00-M25L	●	GYM25LA-G08	●	5
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-G08	●	5
					L	GYHL3232P00-M25L	●	GYM25LA-G08	●	5
		12	24	Modular	R	GYHR1616J00-M20R	●	GYM20RA-G12	●	3
					L	GYHL1616J00-M20L	●	GYM20LA-G12	●	3
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-G12	●	1
					L	GYHL2020K00-M20L	●	GYM20LA-G12	●	1
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-G14	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-G14	●	3
		14	28	Modular	R	GYHR2525M00-M25R	●	GYM25RA-G14	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-G14	●	1
				Modular	R	GYHR3225P00-M25R	●	GYM25RA-G14	●	5
					L	GYHL3225P00-M25L	●	GYM25LA-G14	●	5
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-G14	●	5
					L	GYHL3232P00-M25L	●	GYM25LA-G14	●	5
25 *1	50 *2	Monoblock	R	GYQR2020K00-G25	●	—	—	8		
			L	GYQL2020K00-G25	●	—	—	8		
		Modular	R	GYHR2020K00-M25R	●	GYM25RA-G25	●	4		
			L	GYHL2020K00-M25L	●	GYM25LA-G25	●	4		
		Monoblock	R	GYQR2525M00-G25	●	—	—	7		
			L	GYQL2525M00-G25	●	—	—	7		
		Modular	R	GYHR2525M00-M25R	●	GYM25RA-G25	●	2		
			L	GYHL2525M00-M25L	●	GYM25LA-G25	●	2		
		Modular	R	GYHR3225P00-M25R	●	GYM25RA-G25	●	6		
			L	GYHL3225P00-M25L	●	GYM25LA-G25	●	6		
Modular	R	GYHR3232P00-M25R	●	GYM25RA-G25	●	6				
	L	GYHL3232P00-M25L	●	GYM25LA-G25	●	6				

\*1 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.  
 \*2 The maximum cut off diameter (CUTDIA) varies according to the insert used.  
 The cut off diameter is double the maximum groove depth (CDX) of inserts on pages F012—F015.  
 \*3 Dimensions shown are when the standard insert is used. If other insert geometries are used then LF, LH, LH2 and WF values may vary.

● : Inventory maintained.

GROOVING / CUTTING OFF

\* Wrench : ① : Clamp Screw, ② : Blade Screw



Right hand tool holder shown.

SPARE PARTS			
Holder		5 pcs.	① ②
	Clamp Screw	Blade Screw	Wrench *
GYQR/L	HSC05020 (Clamp Torque : 7.0N·m)	—	HKY40R
GYHR/L	GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R
-M20R/L			②TKY15D
GYHR/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R
-M25R/L			②TKY25D

Dimensions (mm) *3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
20	20	125	41	—	20	20.35	—	R	
20	20	125	41	—	20	20.35	—		
20	20	119	33	54	20	26	5		
20	20	119	33	54	20	26	5		
25	25	150	41	—	25	25.35	—		
25	25	150	41	—	25	25.35	—		
25	25	144	33	51	25	28	—		
25	25	144	33	51	25	28	—		
32	25	164	33	51	32	28	—		
32	25	164	33	51	32	28	—		
32	32	164	33	51	32	35	—		
32	32	164	33	51	32	35	—		
16	16	110	34	50	16	20	4	L	
16	16	110	34	50	16	20	4		
20	20	125	34	49	20	23	—		
20	20	125	34	49	20	23	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	125	46	—	20	20.35	4		
20	20	125	46	—	20	20.35	4		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	150	46	—	25	25.35	—		
25	25	150	46	—	25	25.35	—		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		

Insert selection

Seat Size	Geometry name
G	GY-0239/0250/0274E-Breaker shown below

For grooving/cutting off breaker > F012, F013						
Seat Size	Breaker	GU	GS	GM	05-GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Cutting off)	(Hardened steel)
CW		Neutral	Neutral	Neutral	With hand	Neutral
G	4.00mm	●	●	●	●	●

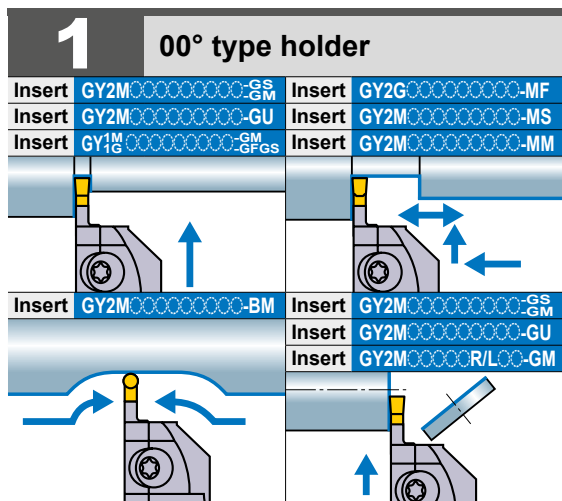
For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying, Recessing)
CW					Ball shape
G	4.00mm	●	●	●	●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	4.24mm	●			

● : Standard insert with dimensions

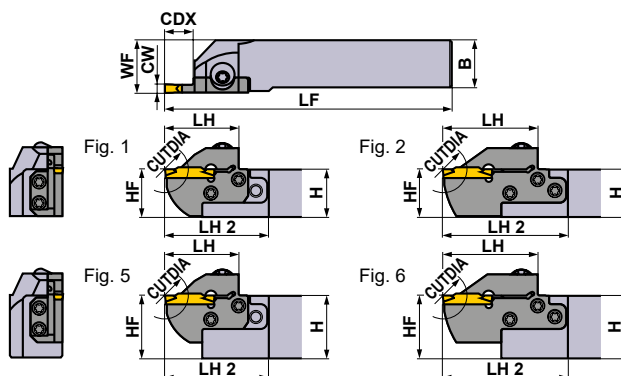
GROOVING / CUTTING OFF

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F096  
 CAUTION FOR USE > F100

# GY SERIES (EXTERNAL)



Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



Right hand tool holder shown.

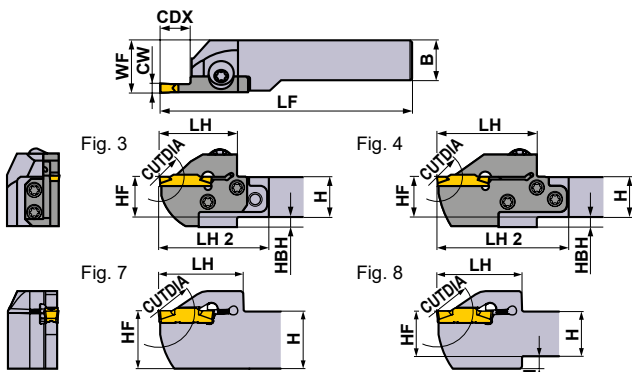
Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number				Fig.
	CW	CDX	CUTDIA			Holder	Stock	Modular Blade	Stock	
H	4.75 5.00 5.24	8	16	Monoblock	R	GYQR2020K00-H08	●	—	—	7
					L	GYQL2020K00-H08	●	—	—	7
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-H08	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-H08	●	3
				Monoblock	R	GYQR2525M00-H08	●	—	—	7
					L	GYQL2525M00-H08	●	—	—	7
		Modular	R	GYHR2525M00-M25R	●	GYM25RA-H08	●	1		
			L	GYHL2525M00-M25L	●	GYM25LA-H08	●	1		
		Modular	R	GYHR3225P00-M25R	●	GYM25RA-H08	●	5		
			L	GYHL3225P00-M25L	●	GYM25LA-H08	●	5		
			R	GYHR3232P00-M25R	●	GYM25RA-H08	●	5		
			L	GYHL3232P00-M25L	●	GYM25LA-H08	●	5		
		12	24	Modular	R	GYHR1616J00-M20R	●	GYM20RA-H12	●	3
				L	GYHL1616J00-M20L	●	GYM20LA-H12	●	3	
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-H12	●	1
					L	GYHL2020K00-M20L	●	GYM20LA-H12	●	1
		14	28	Modular	R	GYHR2020K00-M25R	●	GYM25RA-H14	●	3
				L	GYHL2020K00-M25L	●	GYM25LA-H14	●	3	
				R	GYHR2525M00-M25R	●	GYM25RA-H14	●	1	
				L	GYHL2525M00-M25L	●	GYM25LA-H14	●	1	
				R	GYHR3225P00-M25R	●	GYM25RA-H14	●	5	
				L	GYHL3225P00-M25L	●	GYM25LA-H14	●	5	
				Modular	R	GYHR3232P00-M25R	●	GYM25RA-H14	●	5
					L	GYHL3232P00-M25L	●	GYM25LA-H14	●	5
	25 *1	50 *2	Monoblock	R	GYQR2020K00-H25	●	—	—	8	
			L	GYQL2020K00-H25	●	—	—	8		
			Modular	R	GYHR2020K00-M25R	●	GYM25RA-H25	●	4	
				L	GYHL2020K00-M25L	●	GYM25LA-H25	●	4	
			Monoblock	R	GYQR2525M00-H25	●	—	—	7	
				L	GYQL2525M00-H25	●	—	—	7	
			Modular	R	GYHR2525M00-M25R	●	GYM25RA-H25	●	2	
				L	GYHL2525M00-M25L	●	GYM25LA-H25	●	2	
			Modular	R	GYHR3225P00-M25R	●	GYM25RA-H25	●	6	
				L	GYHL3225P00-M25L	●	GYM25LA-H25	●	6	
			Modular	R	GYHR3232P00-M25R	●	GYM25RA-H25	●	6	
				L	GYHL3232P00-M25L	●	GYM25LA-H25	●	6	

\*1 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.  
 \*2 The maximum cut off diameter (CUTDIA) varies according to the insert used.  
 The cut off diameter is double the maximum groove depth (CDX) of inserts on pages F012—F015.  
 \*3 Dimensions shown are when the standard insert is used. If other insert geometries are used then LF, LH, LH2 and WF values may vary.

● : Inventory maintained.




GROOVING / CUTTING OFF

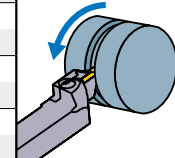
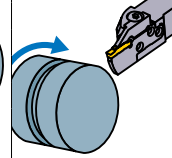
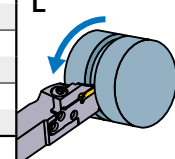
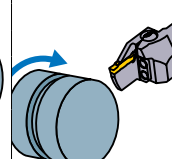
\* Wrench : ① : Clamp Screw, ② : Blade Screw



Right hand tool holder shown.

### SPARE PARTS

Holder		 5 pcs.	
	Clamp Screw	Blade Screw	Wrench *
GYQR/L	HSC05020 (Clamp Torque : 7.0N·m)	—	HKY40R
GYHR/L	GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
GYHR/L			TS55 (Clamp Torque : 5.0N·m)

Dimensions (mm) *3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
20	20	125	41	—	20	20.35	—		
20	20	125	41	—	20	20.35	—		
20	20	119	33	54	20	26	5		
20	20	119	33	54	20	26	5		
25	25	150	41	—	25	25.35	—		
25	25	150	41	—	25	25.35	—		
25	25	144	33	51	25	28	—		
25	25	144	33	51	25	28	—		
32	25	164	33	51	32	28	—		
32	25	164	33	51	32	28	—		
32	32	164	33	51	32	35	—		
32	32	164	33	51	32	35	—		
16	16	110	34	50	16	20	4		
16	16	110	34	50	16	20	4		
20	20	125	34	49	20	23	—		
20	20	125	34	49	20	23	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	125	46	—	20	20.35	4		
20	20	125	46	—	20	20.35	4		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	150	46	—	25	25.35	—		
25	25	150	46	—	25	25.35	—		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		

### Insert selection

Seat Size	Geometry name
H	GY000475/0500/0524H

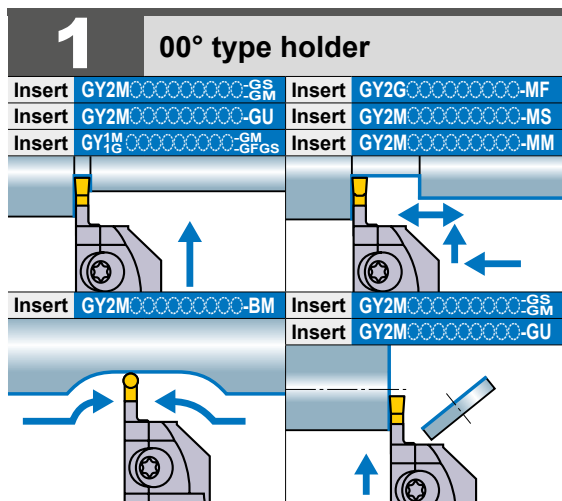
For grooving/cutting off breaker > F012, F013						
Seat Size	Breaker	GU	GS	GM	05-GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Cutting off)	(Hardened steel)
CW	4.75mm	●	●	●	●	●
	5.00mm	●	●	●	●	●
H	4.75mm	●	●	●	●	●
	5.00mm	●	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying, Recessing)
H	4.75mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			
	5.00mm				●
	RE 0.2	●			
H	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	5.24mm	●			

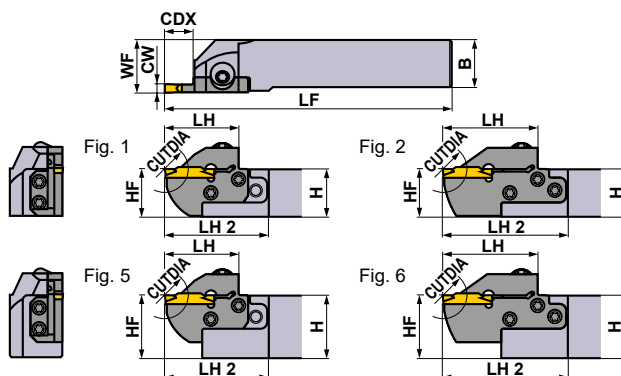
● : Standard insert with dimensions

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F096  
 CAUTION FOR USE > F100

# GY SERIES (EXTERNAL)



Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number				Fig.
	CW	CDX	CUTCUTDIA			Holder	Stock	Modular Blade	Stock	
J	6.00 6.31 6.35	8	16	Monoblock	R	GYQR2020K00-J08	●	—	—	7
				Monoblock	L	GYQL2020K00-J08	●	—	—	7
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-J08	●	3
				Modular	L	GYHL2020K00-M25L	●	GYM25LA-J08	●	3
				Monoblock	R	GYQR2525M00-J08	●	—	—	7
				Monoblock	L	GYQL2525M00-J08	●	—	—	7
		Modular	R	GYHR2525M00-M25R	●	GYM25RA-J08	●	1		
		Modular	L	GYHL2525M00-M25L	●	GYM25LA-J08	●	1		
		Modular	R	GYHR3225P00-M25R	●	GYM25RA-J08	●	5		
		Modular	L	GYHL3225P00-M25L	●	GYM25LA-J08	●	5		
		Modular	R	GYHR3232P00-M25R	●	GYM25RA-J08	●	5		
		Modular	L	GYHL3232P00-M25L	●	GYM25LA-J08	●	5		
	14	28	Modular	R	GYHR2020K00-M25R	●	GYM25RA-J14	●	3	
			Modular	L	GYHL2020K00-M25L	●	GYM25LA-J14	●	3	
			Modular	R	GYHR2525M00-M25R	●	GYM25RA-J14	●	1	
			Modular	L	GYHL2525M00-M25L	●	GYM25LA-J14	●	1	
			Modular	R	GYHR3225P00-M25R	●	GYM25RA-J14	●	5	
			Modular	L	GYHL3225P00-M25L	●	GYM25LA-J14	●	5	
	25 *1	50 *2	Monoblock	R	GYQR2020K00-J25	●	—	—	8	
			Monoblock	L	GYQL2020K00-J25	●	—	—	8	
			Modular	R	GYHR2020K00-M25R	●	GYM25RA-J25	●	4	
			Modular	L	GYHL2020K00-M25L	●	GYM25LA-J25	●	4	
			Monoblock	R	GYQR2525M00-J25	●	—	—	7	
			Monoblock	L	GYQL2525M00-J25	●	—	—	7	
Modular	R	GYHR2525M00-M25R	●	GYM25RA-J25	●	2				
Modular	L	GYHL2525M00-M25L	●	GYM25LA-J25	●	2				
Modular	R	GYHR3225P00-M25R	●	GYM25RA-J25	●	6				
Modular	L	GYHL3225P00-M25L	●	GYM25LA-J25	●	6				
Modular	R	GYHR3232P00-M25R	●	GYM25RA-J25	●	6				
Modular	L	GYHL3232P00-M25L	●	GYM25LA-J25	●	6				

\*1 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.

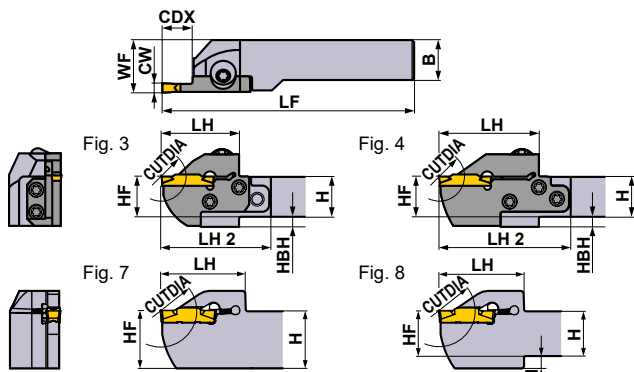
\*2 The maximum cut off diameter (CUTCUTDIA) varies according to the insert used.

The cut off diameter is double the maximum groove depth (CDX) of inserts on pages F012—F015.

\*3 Dimensions shown are when the standard insert is used. If other insert geometries are used then LF, LH, LH2 and WF values may vary.

● : Inventory maintained.





\* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS			
Holder		5 pcs.	
	Clamp Screw	Blade Screw	Wrench *
GYQR/L	HSC05020 (Clamp Torque : 7.0N·m)	—	HKY40R
GYHR/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D

Right hand tool holder shown.

	Dimensions (mm) *3								Cutting Mode	
	H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
	20	20	125	41	—	20	20.35	—	R	
	20	20	125	41	—	20	20.35	—		
	20	20	119	33	54	20	26	5		
	20	20	119	33	54	20	26	5		
	25	25	150	41	—	25	25.35	—		
	25	25	150	41	—	25	25.35	—		
	25	25	144	33	51	25	28	—		
	25	25	144	33	51	25	28	—		
	32	25	164	33	51	32	28	—		
	32	25	164	33	51	32	28	—		
	32	32	164	33	51	32	35	—		
	32	32	164	33	51	32	35	—		
	20	20	125	39	60	20	26	5		
	20	20	125	39	60	20	26	5		
	25	25	150	39	57	25	28	—		
	25	25	150	39	57	25	28	—		
	32	25	170	39	57	32	28	—		
	32	25	170	39	57	32	28	—		
	32	32	170	39	57	32	35	—		
	32	32	170	39	57	32	35	—		
	20	20	125	46	—	20	20.35	4	L	
	20	20	125	46	—	20	20.35	4		
	20	20	136	50	71	20	26	5		
	20	20	136	50	71	20	26	5		
	25	25	150	46	—	25	25.35	—		
	25	25	150	46	—	25	25.35	—		
	25	25	161	50	68	25	28	—		
	25	25	161	50	68	25	28	—		
	32	25	181	50	68	32	28	—		
	32	25	181	50	68	32	28	—		
	32	32	181	50	68	32	35	—		
	32	32	181	50	68	32	35	—		

**Insert selection**

Seat Size	<b>Geometry name</b>
J	GY0600/0631/0635J

**For grooving/cutting off breaker > F012, F013**

Seat Size	Breaker	GU	GS	GM	05-GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Cutting off)	(Hardened steel)
J	6.00mm	●	●	●	●	●
	6.35mm	●	●	●	●	●

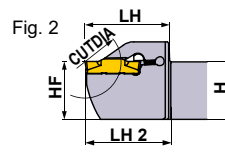
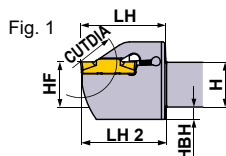
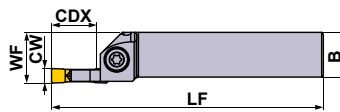
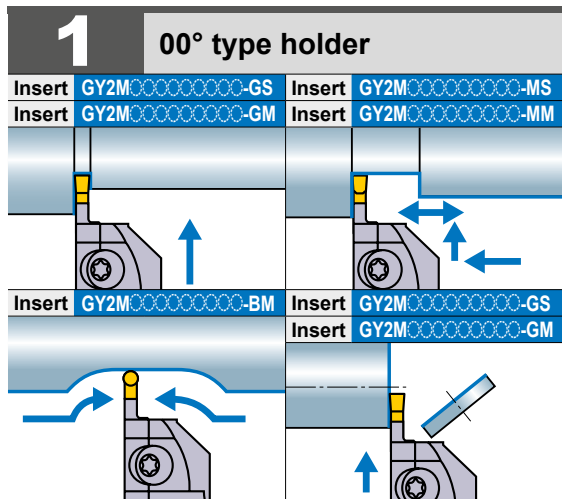
**For multifunctional grooving breaker > F014, F015**

Seat Size	Breaker	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying, Recessing)
J	6.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	6.31mm	●			
	6.35mm				●

● : Standard insert with dimensions

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F096  
 CAUTION FOR USE > F100

# GY SERIES (EXTERNAL)



Right hand tool holder shown.

Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number				Fig.
	CW	CDX	CUTDIA			Holder	Stock	Modular Blade	Stock	
K	8.00	25 *1	50 *2	Monoblock	R	<b>GYPR2525M00-K25</b>	●	—	—	1
				Monoblock	L	<b>GYPL2525M00-K25</b>	●	—	—	1
				Monoblock	R	<b>GYPR3225P00-K25</b>	●	—	—	2
				Monoblock	L	<b>GYPL3225P00-K25</b>	●	—	—	2
				Monoblock	R	<b>GYPR3232P00-K25</b>	●	—	—	3
				Monoblock	L	<b>GYPL3232P00-K25</b>	●	—	—	3

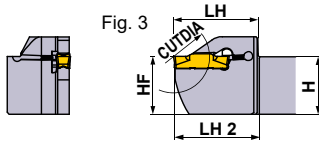
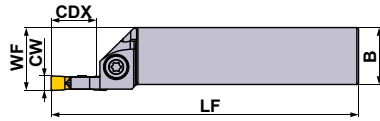
\*1 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012–F015.

\*2 The maximum cut off diameter (CUTDIA) varies according to the insert used.

The cut off diameter is double the maximum groove depth (CDX) of inserts on pages F012–F015.

\*3 Dimensions shown are when the standard insert is used. If other insert geometries are used then LF, LH, LH2 and WF values may vary.

● : Inventory maintained.



Right hand tool holder shown.

SPARE PARTS		
Holder		
	Clamp Screw	Wrench
GYPR/L○○○○○○○○00-K25		GY06013M (Clamp Torque : 6.0N·m)
		TKY30R

	Dimensions (mm) *3								Cutting Mode	
	H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
	25	25	150	47	48	25	28	7	R	
	25	25	150	47	48	25	28	7		
	32	25	170	47	48	32	28	—	L	
	32	25	170	47	48	32	28	—		
	32	32	170	47	48	32	35	—	R	
	32	32	170	47	48	32	35	—		
									L	

**Insert selection**

Seat Size	<b>Geometry name</b>
K	GY○○0800K○○○○-Breaker shown below

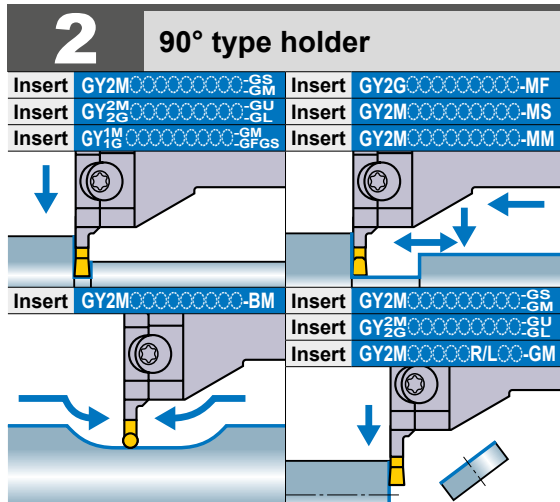
For grooving/cutting off breaker > F012, F013						
Seat Size	Breaker	GU	GS	GM	05-GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Cutting off)	(Hardened steel)
CW	Neutral	Neutral	Neutral	With hand	Neutral	
K	8.00mm		●	●		

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying, Recessing)
CW	RE 0.8		●	●	●
K	RE 1.2		●	●	●

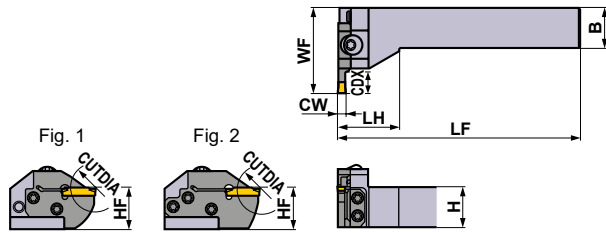
● : Standard insert with dimensions

GROOVING / CUTTING OFF

# GY SERIES (EXTERNAL)



Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number				Fig.
	CW	CDX	CUTDIA			Holder	Stock	Modular Blade	Stock	
D	2.00 2.24	6	12	Modular	R	GYHR2020K90-M20L	●	GYM20LA-D06	●	1
				L	GYHL2020K90-M20R	●	GYM20RA-D06	●	1	
		10	20	Modular	R	GYHR2525M90-M25L	●	GYM25LA-D06	●	1
				L	GYHL2525M90-M25R	●	GYM25RA-D06	●	1	
		12	24	Modular	R	GYHR2020K90-M20L	●	GYM20LA-D10	●	1
				L	GYHL2020K90-M20R	●	GYM20RA-D10	●	1	
18 *4	36	Modular	R	GYHR2525M90-M25L	●	GYM25LA-D12	●	1		
		L	GYHL2525M90-M25R	●	GYM25RA-D12	●	1			
E	2.39 2.50 2.74	6	12	Modular	R	GYHR2020K90-M20L	●	GYM20LA-E06	●	1
				L	GYHL2020K90-M20R	●	GYM20RA-E06	●	1	
		10	20	Modular	R	GYHR2525M90-M25L	●	GYM25LA-E06	●	1
				L	GYHL2525M90-M25R	●	GYM25RA-E06	●	1	
		12	24	Modular	R	GYHR2020K90-M20L	●	GYM20LA-E10	●	1
				L	GYHL2020K90-M20R	●	GYM20RA-E10	●	1	
18 *4	36	Modular	R	GYHR2525M90-M25L	●	GYM25LA-E12	●	1		
		L	GYHL2525M90-M25R	●	GYM25RA-E12	●	1			
20 *1	40 *2	Modular	R	GYHR2020K90-M20L	●	GYM20LB-E18	●	2		
		L	GYHL2020K90-M20R	●	GYM20RB-E18	●	2			
20 *1	40 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LA-E20	●	2		
		L	GYHL2525M90-M25R	●	GYM25RA-E20	●	2			

\*1 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012–F015.

\*2 The maximum cut off diameter (CUTDIA) varies according to the insert used.




The cut off diameter is double the maximum groove depth (CDX) of inserts on pages F012–F015.

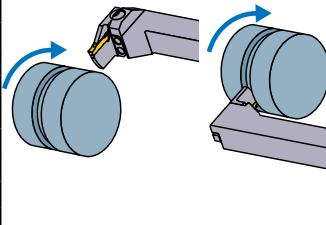
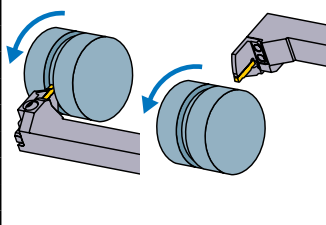
\*3 Dimensions shown are when the standard insert is used. If other insert geometries are used then LF, LH and WF values may vary.

\*4 The maximum groove depth (CDX) is limited by the workpiece diameter. For details, please refer to page F098.

● : Inventory maintained.

\* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS			
Holder		 5 pcs.	
	Clamp Screw	Blade Screw	Wrench *
<b>GYHR2020K90-M20L</b>	GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R
<b>GYHL2020K90-M20R</b>			②TKY15D
<b>GYHR2525M90-M25L</b>		TS55 (Clamp Torque : 5.0N·m)	①TKY30R
<b>GYHL2525M90-M25R</b>			②TKY25D

	Dimensions (mm) *3						Cutting Mode
	H	B	LF	LH	HF	WF	
	20	20	125	35	20	39	<b>R</b> 
	20	20	125	35	20	39	
	25	25	150	38	25	45	
	25	25	150	38	25	45	
	20	20	125	35	20	45	
	20	20	125	35	20	45	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	20	20	125	35	20	51	
	20	20	125	35	20	51	
	25	25	150	38	25	59	<b>L</b> 
	25	25	150	38	25	59	
	20	20	125	35	20	39	
	20	20	125	35	20	39	
	25	25	150	38	25	45	
	25	25	150	38	25	45	
	20	20	125	35	20	45	
	20	20	125	35	20	45	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	20	20	125	35	20	51	
	20	20	125	35	20	51	
	25	25	150	38	25	59	
	25	25	150	38	25	59	

### Insert selection

Seat Size	Geometry name
D	GY○○○0200/0224D○○○○○-Breaker shown below
E	GY○○○0239/0250/0274E○○○○○-Breaker shown below

For grooving/cutting off breaker > F012, F013							
Seat Size	Breaker	GU	GS	GM	GL	05-GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Aluminium alloy)	(Cutting off)	(Hardened steel)
	CW	Neutral	Neutral	Neutral	Neutral	With hand	Neutral
D	2.00mm	●	●	●	●	●	●
E	2.39mm	●	●	●	●	●	●
	2.50mm	●	●	●	●	●	●

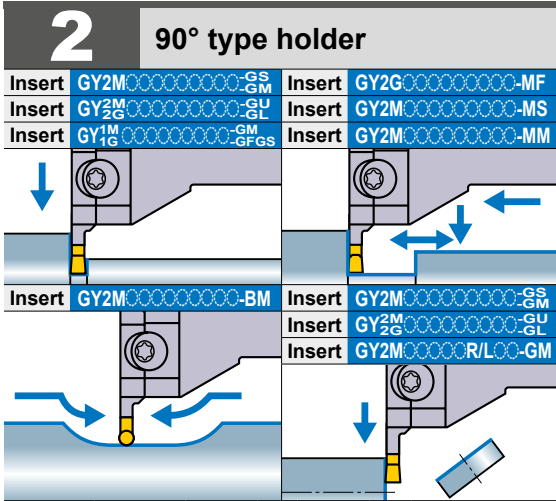
For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying, Recessing)
	CW				Ball shape
D	2.00mm	●	●	●	●
	2.24mm	●			
	2.39mm	●			
E	2.50mm	●	●	●	●
	2.74mm	●			

● : Standard insert with dimensions

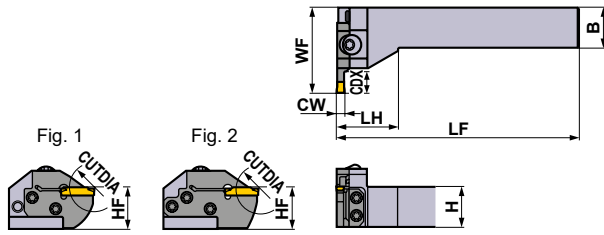
F  
GROOVING / CUTTING OFF

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F096  
 CAUTION FOR USE > F100

# GY SERIES (EXTERNAL)



Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number				Fig.
	CW	CDX	CUTDIA			Holder	Stock	Modular Blade	Stock	
F	3.00 3.18 3.24	6	12	Modular	R	GYHR2020K90-M20L	●	GYM20LA-F06	●	1
				Modular	L	GYHL2020K90-M20R	●	GYM20RA-F06	●	1
		10	20	Modular	R	GYHR2525M90-M25L	●	GYM25LA-F06	●	1
				Modular	L	GYHL2525M90-M25R	●	GYM25RA-F06	●	1
		12	24	Modular	R	GYHR2020K90-M20L	●	GYM20LA-F10	●	1
				Modular	L	GYHL2020K90-M20R	●	GYM20RA-F10	●	1
18 *4	36	Modular	R	GYHR2525M90-M25L	●	GYM25LA-F12	●	1		
		Modular	L	GYHL2525M90-M25R	●	GYM25RA-F12	●	1		
20 *1	40 *2	Modular	R	GYHR2020K90-M20L	●	GYM20LB-F18	●	2		
		Modular	L	GYHL2020K90-M20R	●	GYM20RB-F18	●	2		
G	4.00 4.24	8	16	Modular	R	GYHR2525M90-M25L	●	GYM25LA-G08	●	1
				Modular	L	GYHL2525M90-M25R	●	GYM25RA-G08	●	1
		12	24	Modular	R	GYHR2020K90-M20L	●	GYM20LA-G12	●	1
				Modular	L	GYHL2020K90-M20R	●	GYM20RA-G12	●	1
		14	28	Modular	R	GYHR2525M90-M25L	●	GYM25LA-G14	●	1
				Modular	L	GYHL2525M90-M25R	●	GYM25RA-G14	●	1
25 *1	50 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LA-G25	●	2		
		Modular	L	GYHL2525M90-M25R	●	GYM25RA-G25	●	2		

\*1 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012–F015.

\*2 The maximum cut off diameter (CUTDIA) varies according to the insert used.




The cut off diameter is double the maximum groove depth (CDX) of inserts on pages F012–F015.

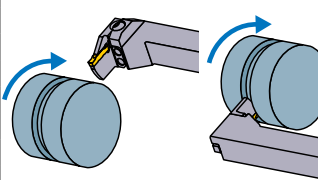
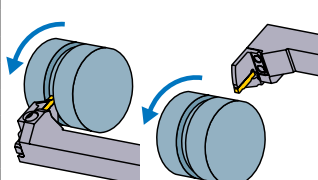
\*3 Dimensions shown are when the standard insert is used. If other insert geometries are used then LF, LH and WF values may vary.

\*4 The maximum groove depth (CDX) is limited by the workpiece diameter. For details, please refer to page F098.

● : Inventory maintained.

\* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS			
Holder		 5 pcs.	
	Clamp Screw	Blade Screw	Wrench *
<b>GYHR2020K90-M20L</b>	GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R
<b>GYHL2020K90-M20R</b>			②TKY15D
<b>GYHR2525M90-M25L</b>		TS55 (Clamp Torque : 5.0N·m)	①TKY30R
<b>GYHL2525M90-M25R</b>			②TKY25D

	Dimensions (mm) *3						Cutting Mode
	H	B	LF	LH	HF	WF	
	20	20	125	35	20	39	<b>R</b> 
	20	20	125	35	20	39	
	25	25	150	38	25	45	
	25	25	150	38	25	45	
	20	20	125	35	20	45	
	20	20	125	35	20	45	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	20	20	125	35	20	51	
	20	20	125	35	20	51	
	25	25	150	38	25	59	<b>L</b> 
	25	25	150	38	25	59	
	25	25	150	38	25	47	
	25	25	150	38	25	47	
	20	20	125	35	20	45	
	20	20	125	35	20	45	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	

### Insert selection

Seat Size	Geometry name
F	GY○○0300/0318/0324F○○○○○-Breaker shown below
G	GY○○0400/0424G○○○○○-Breaker shown below

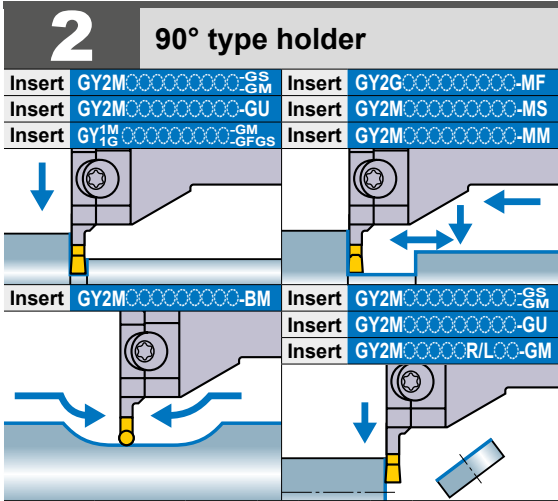
For grooving/cutting off breaker > F012, F013						
Seat Size	Breaker	GU	GS	GM	GL	GFGS
		(For gummy steel)	(Low)	(Medium)	(Aluminium alloy)	(Hardened steel)
	CW	Neutral	Neutral	Neutral	Neutral	With hand
F	3.00mm	●	●	●	●	●
	3.18mm	●	●	●	●	●
G	4.00mm	●	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying, Recessing)
	CW				Ball shape
F	3.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8			●	
	3.18mm				●
	RE 0.2	●			
G	RE 0.4	●			
	3.24mm	●			
	4.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	

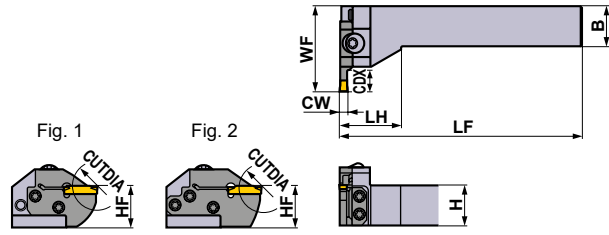
● : Standard insert with dimensions

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F096  
 CAUTION FOR USE > F100

# GY SERIES (EXTERNAL)



Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number				Fig.	
	CW	CDX	CUTDIA			Holder	Stock	Modular Blade	Stock		
H	4.75 5.00 5.24	8	16	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LA-H08 GYM25RA-H08	● ●	1 1	
		12	24	Modular	R L	GYHR2020K90-M20L GYHL2020K90-M20R	● ●	GYM20LA-H12 GYM20RA-H12	● ●	1 1	
		14	28	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LA-H14 GYM25RA-H14	● ●	1 1	
		25 *1	50 *2	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LA-H25 GYM25RA-H25	● ●	2 2	
J	6.00 6.31 6.35	8	16	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LA-J08 GYM25RA-J08	● ●	1 1	
		14	28	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LA-J14 GYM25RA-J14	● ●	1 1	
		25 *1	50 *2	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LA-J25 GYM25RA-J25	● ●	2 2	

\*1 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.

\*2 The maximum cut off diameter (CUTDIA) varies according to the insert used.




The cut off diameter is double the maximum groove depth (CDX) of inserts on pages F012—F015.

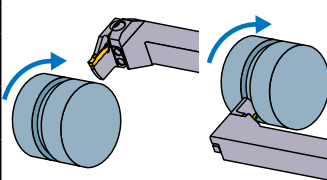
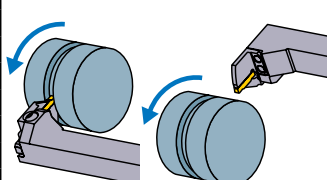
\*3 Dimensions shown are when the standard insert is used. If other insert geometries are used then LF, LH and WF values may vary.

● : Inventory maintained.



\* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS			
Holder Number		 5 pcs.	
	Clamp Screw	Blade Screw	Wrench *
<b>GYHR2020K90-M20L</b>	GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R
<b>GYHL2020K90-M20R</b>			②TKY15D
<b>GYHR2525M90-M25L</b>		TS55 (Clamp Torque : 5.0N·m)	①TKY30R
<b>GYHL2525M90-M25R</b>			②TKY25D

	Dimensions (mm) *3						Cutting Mode
	H	B	LF	LH	HF	WF	
	25	25	150	38	25	47	<b>R</b> 
	25	25	150	38	25	47	
	20	20	125	35	20	45	
	20	20	125	35	20	45	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
	25	25	150	38	25	47	<b>L</b> 
	25	25	150	38	25	47	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
	25	25	150	38	25	64	

**Insert selection**

Seat Size	Geometry name
H	GY○○0475/0500/0524H○○○○○Breaker shown below
J	GY○○0600/0631/0635J○○○○○Breaker shown below

For grooving/cutting off breaker> F012, F013						
Seat Size	Breaker	GU	GS	GM	05-GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Cutting off)	(Hardened steel)
	CW	Neutral	Neutral	Neutral	With hand	Neutral
H	4.75mm	●	●	●	●	●
	5.00mm	●	●	●	●	●
J	6.00mm	●	●	●	●	●
	6.35mm	●	●	●	●	●

For multifunctional grooving breaker> F014, F015					
Seat Size	Breaker	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying, Recessing)
	CW				Ball shape
H	4.75mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			
	5.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
J	5.24mm	●			
	6.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	6.31mm	●			
	6.35mm				●
	RE 0.2	●			
RE 0.4	●				
RE 0.8	●				

● : Standard insert with dimensions

F  
GROOVING / CUTTING OFF

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F096  
 CAUTION FOR USE > F100

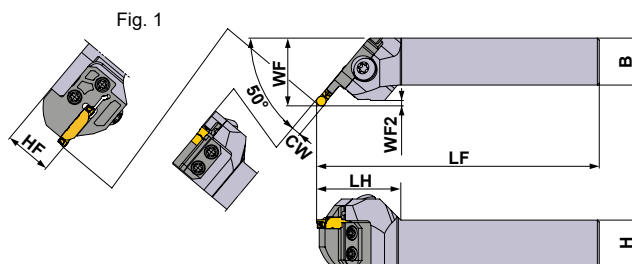
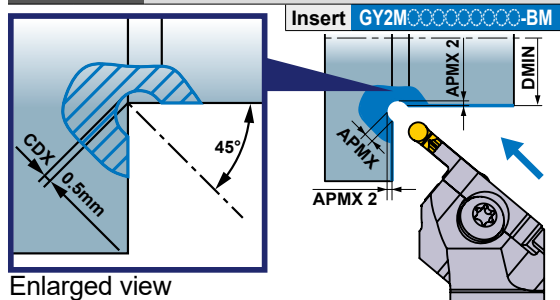
# GY SERIES (FOR EXTERNAL RECESSING)

3

For 50° recessing holder

Note 1) For modular blades and modular holders, please order separately.

Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.




Seat Size	Dimensions (mm)					Type	Hand (R/L)	Order Number				Fig.
	CW	CDX	DMIN	APMX	APMX 2			Holder	Stock	Modular Blade	Stock	
D	2.00	0.5	30	1.5	0.646	Modular	R	GYHR2020K50-M20L	●	GYM20LC-D005	●	1
						Modular	L	GYHL2020K50-M20R	●	GYM20RC-D005	●	1
E	2.50			1.75	0.72	Modular	R	GYHR2525M50-M25L	●	GYM25LC-D005	●	1
						Modular	L	GYHL2525M50-M25R	●	GYM25RC-D005	●	1
F	3.00 3.18			2	0.793	Modular	R	GYHR2020K50-M20L	●	GYM20LC-E005	●	1
						Modular	L	GYHL2020K50-M20R	●	GYM20RC-E005	●	1
G	4.00			2.5	0.939	Modular	R	GYHR2525M50-M25L	●	GYM25LC-E005	●	1
						Modular	L	GYHL2525M50-M25R	●	GYM25RC-E005	●	1
H	4.75 5.00			2.88	1.049	Modular	R	GYHR2020K50-M20L	●	GYM20LC-F005	●	1
						Modular	L	GYHL2020K50-M20R	●	GYM20RC-F005	●	1
J	6.00 6.35	3.5	1.232	Modular	R	GYHR2525M50-M25L	●	GYM25LC-F005	●	1		
				Modular	L	GYHL2525M50-M25R	●	GYM25RC-F005	●	1		

\*1 The blade for external grooving and face grooving cannot be used due to interference with the workpiece.

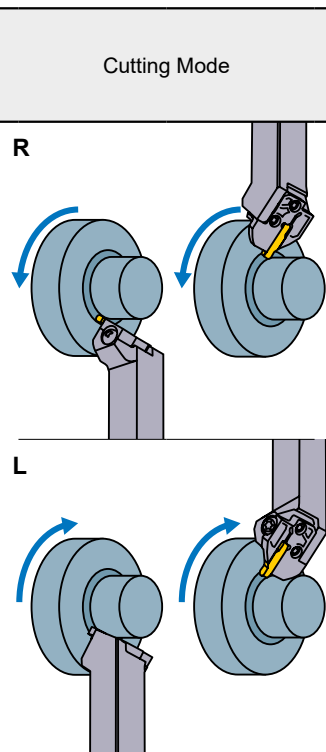
\*2 Dimensions shown are when the standard insert is used. If other insert geometries are used then LF, LH, WF and WF2 values may vary.

● : Inventory maintained.

\* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS			
Holder		 4 pcs.	
	Clamp Screw	Blade Screw	Wrench *
GYHR/L2020K50-M20R/L	GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY25D
GYHR/L2525M50-M25R/L		TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D

	Dimensions (mm) *2						
	H	B	LF	LH	HF	WF	WF2
	20	20	125	40	20	32	1.6
	20	20	125	40	20	32	1.6
	25	25	150	45	25	35	1.6
	25	25	150	45	25	35	1.6
	20	20	125	40	20	32	1.8
	20	20	125	40	20	32	1.8
	25	25	150	45	25	35	1.8
	25	25	150	45	25	35	1.8
	20	20	125	40	20	32	2.0
	20	20	125	40	20	32	2.0
	25	25	150	45	25	35	2.0
	25	25	150	45	25	35	2.0
	20	20	125	40	20	32	2.4
	20	20	125	40	20	32	2.4
	25	25	150	45	25	35	2.4
	25	25	150	45	25	35	2.4
	20	20	125	40	20	33	2.8
	20	20	125	40	20	33	2.8
	25	25	150	45	25	36	2.8
	25	25	150	45	25	36	2.8
	25	25	150	44	25	36	3.4
	25	25	150	44	25	36	3.4



**Insert selection**

Geometry name	
GY2M	○○○○○○○○○○○N-BM

For multifunctional grooving breaker > F015		
Seat Size	Breaker	BM (Copying, Recessing)
	CW	Ball shape
D	2.00mm	●
E	2.50mm	●
F	3.00mm	●
	3.18mm	●
G	4.00mm	●
H	4.75mm	●
	5.00mm	●
J	6.00mm	●
	6.35mm	●

● : Standard insert with dimensions

GROOVING / CUTTING OFF

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F099  
 CAUTION FOR USE > F099

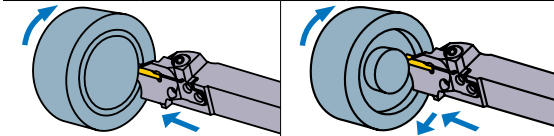
# GY SERIES (FACE GROOVING)

4

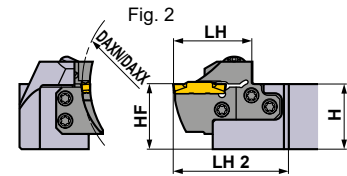
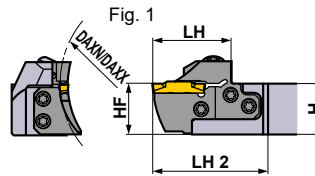
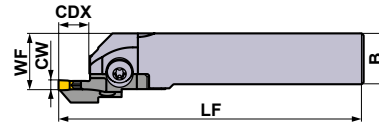
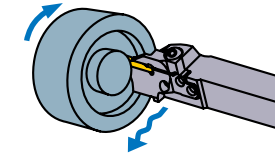
00° type holder

Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>GM</sup> <sub>GFGS</sub>	Insert	GY2M <sup>MM</sup>



Insert GY2M<sup>BM</sup>



Right hand tool holder shown.

Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
D	2.00 2.24	40	50	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-040	●	3
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-D12-040	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-040	●	1
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-D12-040	●	1
		Modular	R	GYHR3225P00-M25R	●	GYM25RD-D12-040	●	2			
		Modular	L	GYHL3225P00-M25L	●	GYM25LD-D12-040	●	2			
		Modular	R	GYHR3232P00-M25R	●	GYM25RD-D12-040	●	2			
		Modular	L	GYHL3232P00-M25L	●	GYM25LD-D12-040	●	2			
		Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-050	●	3			
		Modular	L	GYHL2020K00-M25L	●	GYM25LD-D12-050	●	3			
		Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-050	●	1			
		Modular	L	GYHL2525M00-M25L	●	GYM25LD-D12-050	●	1			
	Modular	R	GYHR3225P00-M25R	●	GYM25RD-D12-050	●	2				
	Modular	L	GYHL3225P00-M25L	●	GYM25LD-D12-050	●	2				
	Modular	R	GYHR3232P00-M25R	●	GYM25RD-D12-050	●	2				
	Modular	L	GYHL3232P00-M25L	●	GYM25LD-D12-050	●	2				
	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-060	●	3				
	Modular	L	GYHL2020K00-M25L	●	GYM25LD-D12-060	●	3				
	Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-060	●	1				
	Modular	L	GYHL2525M00-M25L	●	GYM25LD-D12-060	●	1				
Modular	R	GYHR3225P00-M25R	●	GYM25RD-D12-060	●	2					
Modular	L	GYHL3225P00-M25L	●	GYM25LD-D12-060	●	2					
Modular	R	GYHR3232P00-M25R	●	GYM25RD-D12-060	●	2					
Modular	L	GYHL3232P00-M25L	●	GYM25LD-D12-060	●	2					
Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-075	●	3					
Modular	L	GYHL2020K00-M25L	●	GYM25LD-D12-075	●	3					
Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-075	●	1					
Modular	L	GYHL2525M00-M25L	●	GYM25LD-D12-075	●	1					
Modular	R	GYHR3225P00-M25R	●	GYM25RD-D12-075	●	2					
Modular	L	GYHL3225P00-M25L	●	GYM25LD-D12-075	●	2					
Modular	R	GYHR3232P00-M25R	●	GYM25RD-D12-075	●	2					
Modular	L	GYHL3232P00-M25L	●	GYM25LD-D12-075	●	2					

\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH, LH2, and WF values may vary.

● : Inventory maintained.

\* Wrench : ① : Clamp Screw, ② : Blade Screw

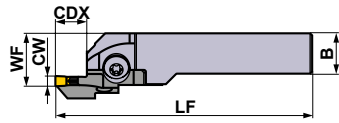
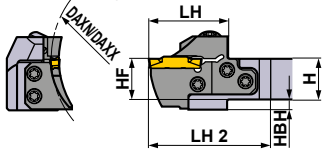





Fig. 3

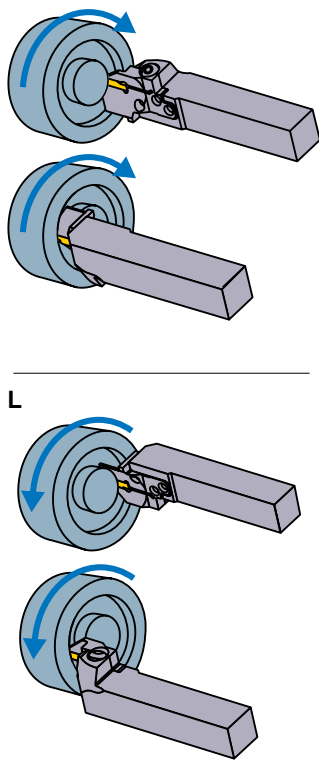


Right hand tool holder shown.

### SPARE PARTS

Holder		 5 pcs.	
	Clamp Screw	Blade Screw	Wrench *
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Dimensions (mm) *1									Cutting Mode
H	B	LF	LH	LH 2	HF	WF	HBH		
20	20	125	39	60	20	26	5	R	
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—	R	
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—	R	
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—	R	
32	32	170	39	57	32	35	—		
20	20	125	39	60	20	26	5	L	
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—	L	
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—	L	
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—	L	
32	32	170	39	57	32	35	—		
20	20	125	39	60	20	26	5	L	
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—	L	
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—	L	
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—	L	
32	32	170	39	57	32	35	—		



### Insert selection

Seat Size	Geometry name
D	GY○○0200/0224D○○○—Breaker shown below

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
D	2.00mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying) Ball shape
D	2.00mm	●	●	●	●
	2.24mm	●	●	●	●

● : Standard insert with dimensions

GROOVING / CUTTING OFF

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F104  
 CAUTION FOR USE > F106

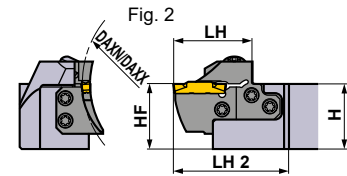
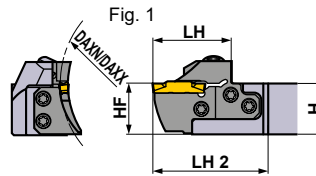
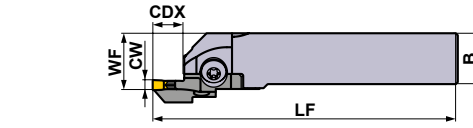
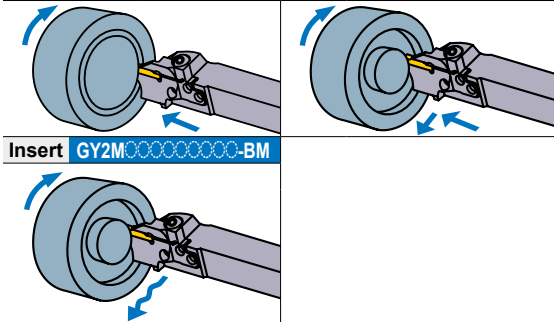
# GY SERIES (FACE GROOVING)

4

00° type holder

Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>GM</sup> <sub>GFGS</sub>	Insert	GY2M <sup>MM</sup>



Right hand tool holder shown.

Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
D	2.00 2.24	100	150	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-100	●	3
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-D12-100	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-100	●	1
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-D12-100	●	1
		Modular	R	GYHR3225P00-M25R	●	GYM25RD-D12-100	●	2			
		Modular	L	GYHL3225P00-M25L	●	GYM25LD-D12-100	●	2			
		Modular	R	GYHR3232P00-M25R	●	GYM25RD-D12-100	●	2			
		Modular	L	GYHL3232P00-M25L	●	GYM25LD-D12-100	●	2			
	135	200	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-135	●	3	
				Modular	L	GYHL2020K00-M25L	●	GYM25LD-D12-135	●	3	
				Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-135	●	1	
				Modular	L	GYHL2525M00-M25L	●	GYM25LD-D12-135	●	1	
	180	250	12	Modular	R	GYHR3225P00-M25R	●	GYM25RD-D12-135	●	2	
				Modular	L	GYHL3225P00-M25L	●	GYM25LD-D12-135	●	2	
				Modular	R	GYHR3232P00-M25R	●	GYM25RD-D12-135	●	2	
				Modular	L	GYHL3232P00-M25L	●	GYM25LD-D12-135	●	2	
180	250	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-180	●	3		
			Modular	L	GYHL2020K00-M25L	●	GYM25LD-D12-180	●	3		
			Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-180	●	1		
			Modular	L	GYHL2525M00-M25L	●	GYM25LD-D12-180	●	1		
	Modular	R	GYHR3225P00-M25R	●	GYM25RD-D12-180	●	2				
	Modular	L	GYHL3225P00-M25L	●	GYM25LD-D12-180	●	2				
	Modular	R	GYHR3232P00-M25R	●	GYM25RD-D12-180	●	2				
	Modular	L	GYHL3232P00-M25L	●	GYM25LD-D12-180	●	2				

\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH, LH2, and WF values may vary.

● : Inventory maintained.

\* Wrench : ① : Clamp Screw, ② : Blade Screw

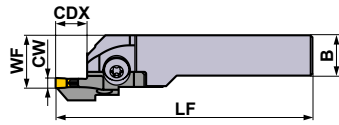
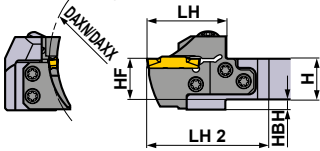





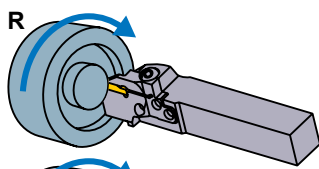
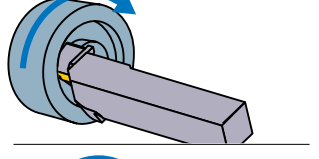
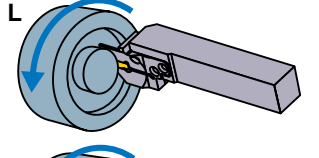
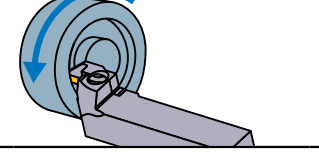


Fig. 3



Right hand tool holder shown.

### SPARE PARTS

Holder		 5 pcs.	
	Clamp Screw	Blade Screw	Wrench *
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

	Dimensions (mm) *1								Cutting Mode
	H	B	LF	LH	LH 2	HF	WF	HBH	
	20	20	125	39	60	20	26	5	<b>R</b>
	20	20	125	39	60	20	26	5	
	25	25	150	39	57	25	28	—	
	25	25	150	39	57	25	28	—	
	32	25	170	39	57	32	28	—	
	32	25	170	39	57	32	28	—	
	32	32	170	39	57	32	35	—	<b>L</b>
	32	32	170	39	57	32	35	—	
	20	20	125	39	60	20	26	5	
	20	20	125	39	60	20	26	5	
	25	25	150	39	57	25	28	—	
	25	25	150	39	57	25	28	—	
	32	25	170	39	57	32	28	—	
	32	25	170	39	57	32	28	—	
	32	32	170	39	57	32	35	—	
	32	32	170	39	57	32	35	—	

### Insert selection

Seat Size	Geometry name				
D	GY○○0200/0224D○○○-Breaker shown below				

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
D	2.00mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying) Ball shape
D	2.00mm	●	●	●	●
	2.24mm	●	●	●	●

● : Standard insert with dimensions

GROOVING / CUTTING OFF

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F104  
 CAUTION FOR USE > F106

# GY SERIES (FACE GROOVING)

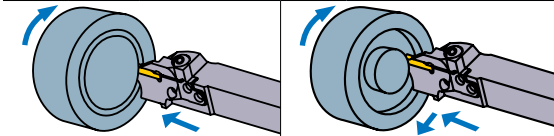
4

00° type holder

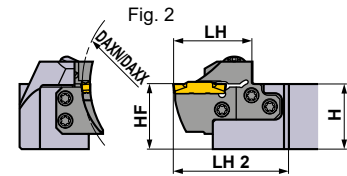
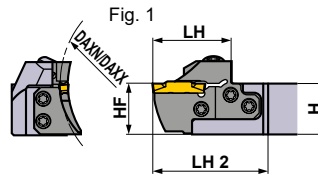
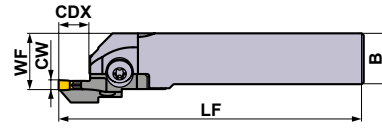
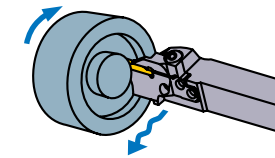
Note 1) For modular blades and modular holders, please order separately.

Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>GM</sup> <sub>GFGS</sub>	Insert	GY2M <sup>MM</sup>



Insert GY2M<sup>BM</sup>



Right hand tool holder shown.

Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
E	2.39 2.50 2.74	40	50	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-040	●	3
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-E12-040	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-040	●	1
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-E12-040	●	1
		Modular	R	GYHR3225P00-M25R	●	GYM25RD-E12-040	●	2			
		Modular	L	GYHL3225P00-M25L	●	GYM25LD-E12-040	●	2			
		Modular	R	GYHR3232P00-M25R	●	GYM25RD-E12-040	●	2			
		Modular	L	GYHL3232P00-M25L	●	GYM25LD-E12-040	●	2			
		Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-050	●	3			
		Modular	L	GYHL2020K00-M25L	●	GYM25LD-E12-050	●	3			
		Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-050	●	1			
		Modular	L	GYHL2525M00-M25L	●	GYM25LD-E12-050	●	1			
	Modular	R	GYHR3225P00-M25R	●	GYM25RD-E12-050	●	2				
	Modular	L	GYHL3225P00-M25L	●	GYM25LD-E12-050	●	2				
	Modular	R	GYHR3232P00-M25R	●	GYM25RD-E12-050	●	2				
	Modular	L	GYHL3232P00-M25L	●	GYM25LD-E12-050	●	2				
	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-060	●	3				
	Modular	L	GYHL2020K00-M25L	●	GYM25LD-E12-060	●	3				
	Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-060	●	1				
	Modular	L	GYHL2525M00-M25L	●	GYM25LD-E12-060	●	1				
Modular	R	GYHR3225P00-M25R	●	GYM25RD-E12-060	●	2					
Modular	L	GYHL3225P00-M25L	●	GYM25LD-E12-060	●	2					
Modular	R	GYHR3232P00-M25R	●	GYM25RD-E12-060	●	2					
Modular	L	GYHL3232P00-M25L	●	GYM25LD-E12-060	●	2					
Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-075	●	3					
Modular	L	GYHL2020K00-M25L	●	GYM25LD-E12-075	●	3					
Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-075	●	1					
Modular	L	GYHL2525M00-M25L	●	GYM25LD-E12-075	●	1					
Modular	R	GYHR3225P00-M25R	●	GYM25RD-E12-075	●	2					
Modular	L	GYHL3225P00-M25L	●	GYM25LD-E12-075	●	2					
Modular	R	GYHR3232P00-M25R	●	GYM25RD-E12-075	●	2					
Modular	L	GYHL3232P00-M25L	●	GYM25LD-E12-075	●	2					

\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH, LH2, and WF values may vary.

● : Inventory maintained.



\* Wrench : ① : Clamp Screw, ② : Blade Screw

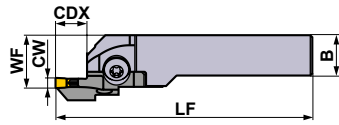
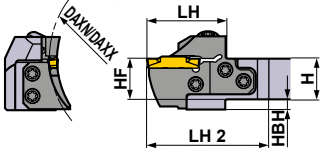





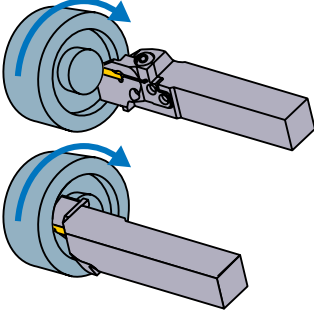
Fig. 3

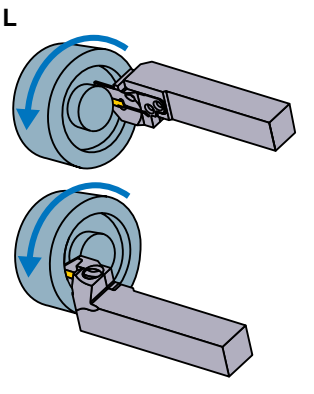


Right hand tool holder shown.

### SPARE PARTS

Holder Number		 5 pcs.	
	Clamp Screw	Blade Screw	Wrench *
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

	Dimensions (mm) *1								Cutting Mode
	H	B	LF	LH	LH 2	HF	WF	HBH	
	20	20	125	39	60	20	26	5	<b>R</b> 
	20	20	125	39	60	20	26	5	
	25	25	150	39	57	25	28	—	
	25	25	150	39	57	25	28	—	
	32	25	170	39	57	32	28	—	
	32	25	170	39	57	32	28	—	
	32	32	170	39	57	32	35	—	
	32	32	170	39	57	32	35	—	
	20	20	125	39	60	20	26	5	
	20	20	125	39	60	20	26	5	
	25	25	150	39	57	25	28	—	
	25	25	150	39	57	25	28	—	
	32	25	170	39	57	32	28	—	
	32	25	170	39	57	32	28	—	
	32	32	170	39	57	32	35	—	
	32	32	170	39	57	32	35	—	
	20	20	125	39	60	20	26	5	
	20	20	125	39	60	20	26	5	
	25	25	150	39	57	25	28	—	
	25	25	150	39	57	25	28	—	
	32	25	170	39	57	32	28	—	
	32	25	170	39	57	32	28	—	
	32	32	170	39	57	32	35	—	
	32	32	170	39	57	32	35	—	



### Insert selection

Seat Size	Geometry name
E	GY○○0239/0250/0274E○○○○○Breaker shown below

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker	GU	GS	GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Hardened steel)
E	CW	●	●	●	●
	E	2.39mm	●	●	●
		2.50mm	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying)
E	CW				Ball shape
	E	2.39mm	●		
		2.50mm	●	●	
		2.74mm	●		

● : Standard insert with dimensions

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F104  
 CAUTION FOR USE > F106

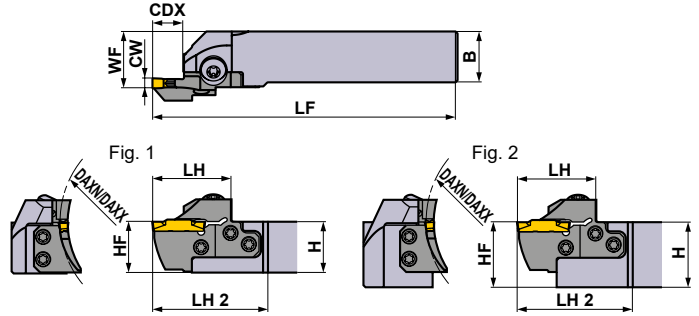
# GY SERIES (FACE GROOVING)

**4** 00° type holder

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>GM</sup> <sub>G</sub>	Insert	GY2M <sup>MM</sup>

Insert GY2M<sup>BM</sup>

Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
E	2.39 2.50 2.74	100	150	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-100	●	3
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-E12-100	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-100	●	1
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-E12-100	●	1
		Modular	R	GYHR3225P00-M25R	●	GYM25RD-E12-100	●	2			
		Modular	L	GYHL3225P00-M25L	●	GYM25LD-E12-100	●	2			
		Modular	R	GYHR3232P00-M25R	●	GYM25RD-E12-100	●	2			
		Modular	L	GYHL3232P00-M25L	●	GYM25LD-E12-100	●	2			
	135	200	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-135	●	3	
				Modular	L	GYHL2020K00-M25L	●	GYM25LD-E12-135	●	3	
				Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-135	●	1	
				Modular	L	GYHL2525M00-M25L	●	GYM25LD-E12-135	●	1	
		Modular	R	GYHR3225P00-M25R	●	GYM25RD-E12-135	●	2			
		Modular	L	GYHL3225P00-M25L	●	GYM25LD-E12-135	●	2			
		Modular	R	GYHR3232P00-M25R	●	GYM25RD-E12-135	●	2			
		Modular	L	GYHL3232P00-M25L	●	GYM25LD-E12-135	●	2			
180	250	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-180	●	3		
			Modular	L	GYHL2020K00-M25L	●	GYM25LD-E12-180	●	3		
			Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-180	●	1		
			Modular	L	GYHL2525M00-M25L	●	GYM25LD-E12-180	●	1		
	Modular	R	GYHR3225P00-M25R	●	GYM25RD-E12-180	●	2				
	Modular	L	GYHL3225P00-M25L	●	GYM25LD-E12-180	●	2				
	Modular	R	GYHR3232P00-M25R	●	GYM25RD-E12-180	●	2				
	Modular	L	GYHL3232P00-M25L	●	GYM25LD-E12-180	●	2				

\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH, LH2, and WF values may vary.

● : Inventory maintained.

GROOVING / CUTTING OFF

\* Wrench : ① : Clamp Screw, ② : Blade Screw

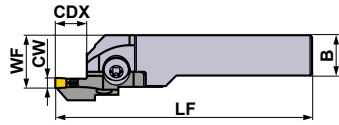
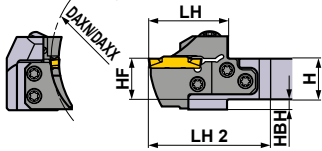


Fig. 3

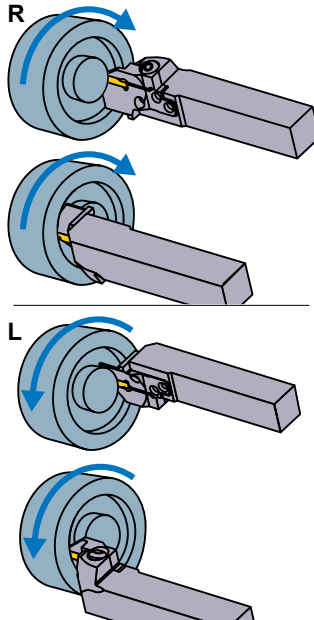


Right hand tool holder shown.

### SPARE PARTS

Holder		5 pcs.	
	Clamp Screw	Blade Screw	Wrench *
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

	Dimensions (mm) *1								Cutting Mode
	H	B	LF	LH	LH 2	HF	WF	HBH	
	20	20	125	39	60	20	26	5	R
	20	20	125	39	60	20	26	5	
	25	25	150	39	57	25	28	—	R
	25	25	150	39	57	25	28	—	
	32	25	170	39	57	32	28	—	R
	32	25	170	39	57	32	28	—	
	32	32	170	39	57	32	35	—	R
	32	32	170	39	57	32	35	—	
	20	20	125	39	60	20	26	5	L
	20	20	125	39	60	20	26	5	
	25	25	150	39	57	25	28	—	L
	25	25	150	39	57	25	28	—	
	32	25	170	39	57	32	28	—	L
	32	25	170	39	57	32	28	—	
	32	32	170	39	57	32	35	—	L
	32	32	170	39	57	32	35	—	
	20	20	125	39	60	20	26	5	L
	20	20	125	39	60	20	26	5	
	25	25	150	39	57	25	28	—	L
	25	25	150	39	57	25	28	—	
	32	25	170	39	57	32	28	—	L
	32	25	170	39	57	32	28	—	
	32	32	170	39	57	32	35	—	L
	32	32	170	39	57	32	35	—	



### Insert selection

Seat Size	Geometry name
E	GY○○0239/0250/0274E○○○○○Breaker shown below

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker	GU	GS	GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Hardened steel)
E	2.39mm	●	●	●	●
	2.50mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying)
E	2.39mm	●			
	2.50mm	●	●	●	●
	2.74mm	●			

● : Standard insert with dimensions

GROOVING / CUTTING OFF

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F104  
 CAUTION FOR USE > F106

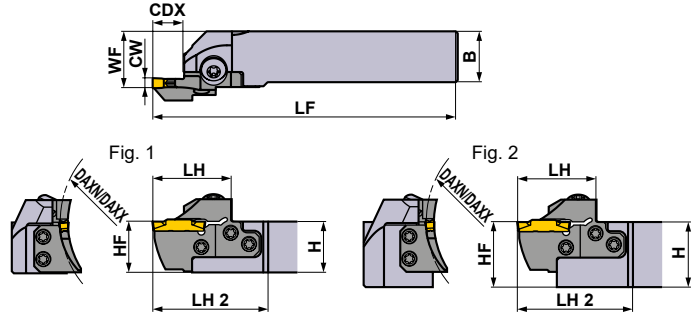
# GY SERIES (FACE GROOVING)

**4** 00° type holder

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>GM</sup> <sub>G</sub> <sup>GFGS</sup>	Insert	GY2M <sup>MM</sup>

Insert **GY2M<sup>BM</sup>**

Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
F	3.00 3.18 3.24	35	40	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-035	●	3
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-F12-035	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-035	●	1
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-F12-035	●	1
		Modular	R	GYHR3225P00-M25R	●	GYM25RD-F12-035	●	2			
		Modular	L	GYHL3225P00-M25L	●	GYM25LD-F12-035	●	2			
		Modular	R	GYHR3232P00-M25R	●	GYM25RD-F12-035	●	2			
		Modular	L	GYHL3232P00-M25L	●	GYM25LD-F12-035	●	2			
	50	40	50	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-040	●	3
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-F12-040	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-040	●	1
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-F12-040	●	1
		Modular	R	GYHR3225P00-M25R	●	GYM25RD-F12-040	●	2			
		Modular	L	GYHL3225P00-M25L	●	GYM25LD-F12-040	●	2			
		Modular	R	GYHR3232P00-M25R	●	GYM25RD-F12-040	●	2			
		Modular	L	GYHL3232P00-M25L	●	GYM25LD-F12-040	●	2			
60	50	60	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-050	●	3	
				Modular	L	GYHL2020K00-M25L	●	GYM25LD-F12-050	●	3	
				Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-050	●	1	
				Modular	L	GYHL2525M00-M25L	●	GYM25LD-F12-050	●	1	
	Modular	R	GYHR3225P00-M25R	●	GYM25RD-F12-050	●	2				
	Modular	L	GYHL3225P00-M25L	●	GYM25LD-F12-050	●	2				
	Modular	R	GYHR3232P00-M25R	●	GYM25RD-F12-050	●	2				
	Modular	L	GYHL3232P00-M25L	●	GYM25LD-F12-050	●	2				

\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH, LH2, and WF values may vary.

● : Inventory maintained.

GROOVING / CUTTING OFF

★ Wrench : ① : Clamp Screw, ② : Blade Screw

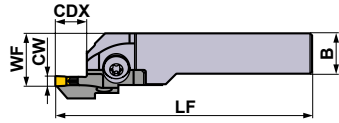
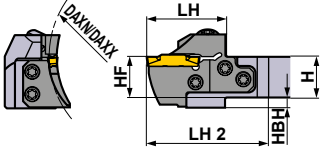





Fig. 3

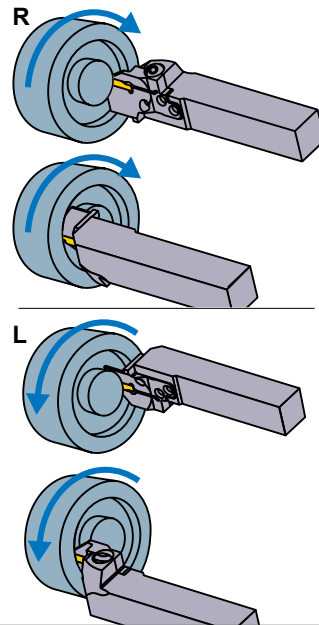


Right hand tool holder shown.

### SPARE PARTS

Holder		 5 pcs.	
	Clamp Screw	Blade Screw	Wrench ★
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Dimensions (mm) ★1									Cutting Mode
H	B	LF	LH	LH 2	HF	WF	HBH		
20	20	125	39	60	20	26	5	R	
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—	R	
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—	R	
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—	R	
32	32	170	39	57	32	35	—		
20	20	125	39	60	20	26	5	L	
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—	L	
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—	L	
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—	L	
32	32	170	39	57	32	35	—		
20	20	125	39	60	20	26	5	L	
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—	L	
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—	L	
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—	L	
32	32	170	39	57	32	35	—		



### Insert selection

Seat Size	Geometry name
F	GY○○0300/0318/0324F○○○○-Breaker shown below

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker	GU	GS	GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Hardened steel)
F	3.00mm	●	●	●	●
	3.18mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying)
F	3.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8			●	
	3.18mm				●
	RE 0.2	●			
	RE 0.4	●			
	3.24mm	●			

● : Standard insert with dimensions

T

GROOVING / CUTTING OFF

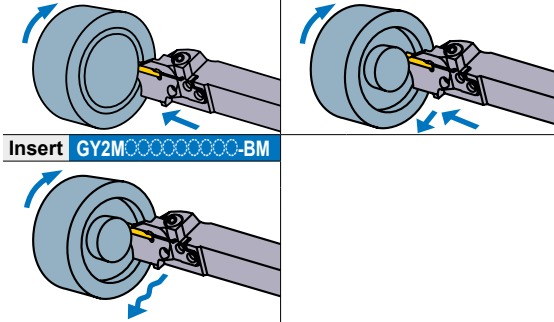
IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F104  
 CAUTION FOR USE > F106

# GY SERIES (FACE GROOVING)

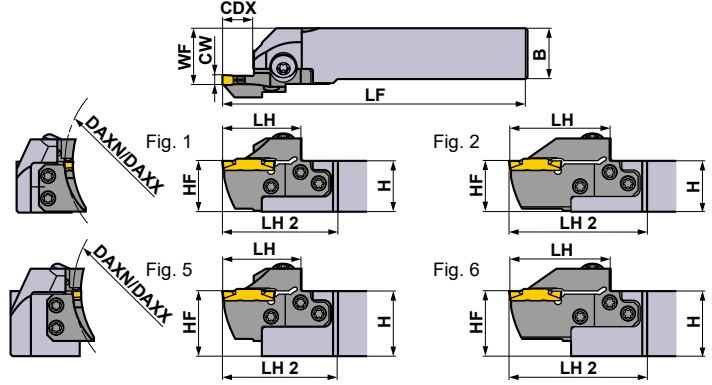
4

00° type holder

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>M</sup> <sub>G</sub> <sup>GM</sup> <sub>GFGS</sub>	Insert	GY2M <sup>MM</sup>



Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

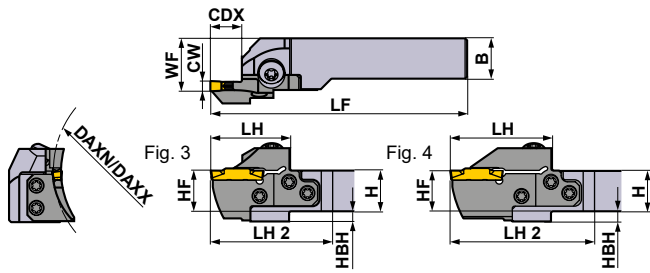


Right hand tool holder shown.

Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
F	3.00 3.18 3.24	60	75	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-060	●	3
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-F12-060	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-060	●	1
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-F12-060	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-F12-060	●	5
					Modular	L	GYHL3225P00-M25L	●	GYM25LD-F12-060	●	5
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-F12-060	●	5
					Modular	L	GYHL3232P00-M25L	●	GYM25LD-F12-060	●	5
		Modular	R	GYHR2020K00-M25R	●	GYM25RD-F20-060	●	4			
		Modular	L	GYHL2020K00-M25L	●	GYM25LD-F20-060	●	4			
		Modular	R	GYHR2525M00-M25R	●	GYM25RD-F20-060	●	2			
		Modular	L	GYHL2525M00-M25L	●	GYM25LD-F20-060	●	2			
		Modular	R	GYHR3225P00-M25R	●	GYM25RD-F20-060	●	6			
		Modular	L	GYHL3225P00-M25L	●	GYM25LD-F20-060	●	6			
		Modular	R	GYHR3232P00-M25R	●	GYM25RD-F20-060	●	6			
		Modular	L	GYHL3232P00-M25L	●	GYM25LD-F20-060	●	6			
	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-075	●	3				
	Modular	L	GYHL2020K00-M25L	●	GYM25LD-F12-075	●	3				
	Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-075	●	1				
	Modular	L	GYHL2525M00-M25L	●	GYM25LD-F12-075	●	1				
Modular	R	GYHR3225P00-M25R	●	GYM25RD-F12-075	●	5					
Modular	L	GYHL3225P00-M25L	●	GYM25LD-F12-075	●	5					
Modular	R	GYHR3232P00-M25R	●	GYM25RD-F12-075	●	5					
Modular	L	GYHL3232P00-M25L	●	GYM25LD-F12-075	●	5					
Modular	R	GYHR2020K00-M25R	●	GYM25RD-F20-075	●	4					
Modular	L	GYHL2020K00-M25L	●	GYM25LD-F20-075	●	4					
Modular	R	GYHR2525M00-M25R	●	GYM25RD-F20-075	●	2					
Modular	L	GYHL2525M00-M25L	●	GYM25LD-F20-075	●	2					
Modular	R	GYHR3225P00-M25R	●	GYM25RD-F20-075	●	6					
Modular	L	GYHL3225P00-M25L	●	GYM25LD-F20-075	●	6					
Modular	R	GYHR3232P00-M25R	●	GYM25RD-F20-075	●	6					
Modular	L	GYHL3232P00-M25L	●	GYM25LD-F20-075	●	6					

\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH, LH2, and WF values may vary.  
 \*2 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.

● : Inventory maintained.



\* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS			
Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench *
GYHR/L2020K00-M25R/L			
GYHR/L2525M00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Right hand tool holder shown.

Dimensions (mm) *1									Cutting Mode
H	B	LF	LH	LH 2	HF	WF	HBH		
20	20	125	39	60	20	26	5	R	
20	20	125	39	60	20	26	5	R	
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	131	45	66	20	26	5		
20	20	131	45	66	20	26	5		
25	25	156	45	63	25	28	—		
25	25	156	45	63	25	28	—		
32	25	176	45	63	32	28	—		
32	25	176	45	63	32	28	—		
32	32	176	45	63	32	35	—		
32	32	176	45	63	32	35	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	131	45	66	20	26	5		
20	20	131	45	66	20	26	5		
25	25	156	45	63	25	28	—		
25	25	156	45	63	25	28	—		
32	25	176	45	63	32	28	—		
32	25	176	45	63	32	28	—		
32	32	176	45	63	32	35	—		
32	32	176	45	63	32	35	—		

### Insert selection

Seat Size	Geometry name
F	GY○○○0300/0318/0324F○○○○○Breaker shown below

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker CW	GU	GS	GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Hardened steel)
F	3.00mm	●	●	●	●
	3.18mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker CW	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying) Ball shape
F	3.00mm	●	●	●	●
	RE 0.2	●	●	●	●
	RE 0.4	●	●	●	●
	RE 0.8	●	●	●	●
	3.18mm	●	●	●	●
	RE 0.2	●	●	●	●
RE 0.4	●	●	●	●	
3.24mm	●	●	●	●	

● : Standard insert with dimensions

T

GROOVING / CUTTING OFF

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F104  
 CAUTION FOR USE > F106

# GY SERIES (FACE GROOVING)

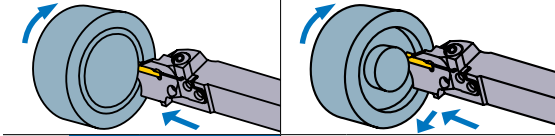
4

00° type holder

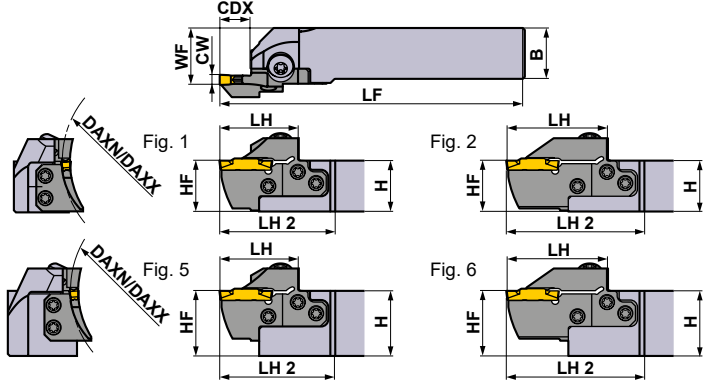
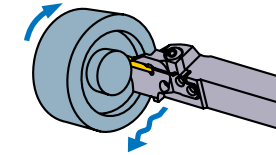
Note 1) For modular blades and modular holders, please order separately.

Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>M</sup> <sub>G</sub> <sup>GM</sup> <sub>GFGS</sub>	Insert	GY2M <sup>MM</sup>



Insert GY2M<sup>BM</sup>



Right hand tool holder shown.

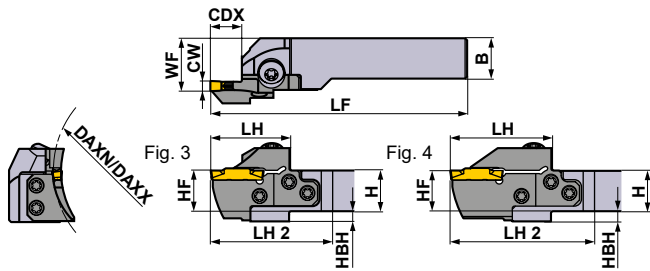
Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
F	3.00 3.18 3.24	100	150	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-100	●	3
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-F12-100	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-100	●	1
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-F12-100	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-F12-100	●	5
					Modular	L	GYHL3225P00-M25L	●	GYM25LD-F12-100	●	5
		Modular	R	GYHR3232P00-M25R	●	GYM25RD-F12-100	●	5			
		Modular	L	GYHL3232P00-M25L	●	GYM25LD-F12-100	●	5			
		Modular	R	GYHR2020K00-M25R	●	GYM25RD-F20-100	●	4			
		Modular	L	GYHL2020K00-M25L	●	GYM25LD-F20-100	●	4			
		Modular	R	GYHR2525M00-M25R	●	GYM25RD-F20-100	●	2			
		Modular	L	GYHL2525M00-M25L	●	GYM25LD-F20-100	●	2			
	Modular	R	GYHR3225P00-M25R	●	GYM25RD-F20-100	●	6				
	Modular	L	GYHL3225P00-M25L	●	GYM25LD-F20-100	●	6				
	Modular	R	GYHR3232P00-M25R	●	GYM25RD-F20-100	●	6				
	Modular	L	GYHL3232P00-M25L	●	GYM25LD-F20-100	●	6				
	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-135	●	3				
	Modular	L	GYHL2020K00-M25L	●	GYM25LD-F12-135	●	3				
	Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-135	●	1				
	Modular	L	GYHL2525M00-M25L	●	GYM25LD-F12-135	●	1				
	Modular	R	GYHR3225P00-M25R	●	GYM25RD-F12-135	●	5				
	Modular	L	GYHL3225P00-M25L	●	GYM25LD-F12-135	●	5				
	Modular	R	GYHR3232P00-M25R	●	GYM25RD-F12-135	●	5				
	Modular	L	GYHL3232P00-M25L	●	GYM25LD-F12-135	●	5				
Modular	R	GYHR2020K00-M25R	●	GYM25RD-F20-135	●	4					
Modular	L	GYHL2020K00-M25L	●	GYM25LD-F20-135	●	4					
Modular	R	GYHR2525M00-M25R	●	GYM25RD-F20-135	●	2					
Modular	L	GYHL2525M00-M25L	●	GYM25LD-F20-135	●	2					
Modular	R	GYHR3225P00-M25R	●	GYM25RD-F20-135	●	6					
Modular	L	GYHL3225P00-M25L	●	GYM25LD-F20-135	●	6					
Modular	R	GYHR3232P00-M25R	●	GYM25RD-F20-135	●	6					
Modular	L	GYHL3232P00-M25L	●	GYM25LD-F20-135	●	6					

\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH, LH2, and WF values may vary.

\*2 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.

● : Inventory maintained.





\* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS			
Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench *
GYHR/L2020K00-M25R/L			
GYHR/L2525M00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Right hand tool holder shown.

Dimensions (mm) *1									Cutting Mode
H	B	LF	LH	LH 2	HF	WF	HBH		
20	20	125	39	60	20	26	5	R	
20	20	125	39	60	20	26	5	R	
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	131	45	66	20	26	5		
20	20	131	45	66	20	26	5		
25	25	156	45	63	25	28	—		
25	25	156	45	63	25	28	—		
32	25	176	45	63	32	28	—		
32	25	176	45	63	32	28	—		
32	32	176	45	63	32	35	—		
32	32	176	45	63	32	35	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	131	45	66	20	26	5		
20	20	131	45	66	20	26	5		
25	25	156	45	63	25	28	—		
25	25	156	45	63	25	28	—		
32	25	176	45	63	32	28	—		
32	25	176	45	63	32	28	—		
32	32	176	45	63	32	35	—		
32	32	176	45	63	32	35	—		

### Insert selection

Seat Size	Geometry name
F	GY○○○0300/0318/0324F○○○○○Breaker shown below

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker CW	GU	GS	GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Hardened steel)
F	3.00mm	●	●	●	●
	3.18mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker CW	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying) Ball shape
F	3.00mm	●	●	●	●
	RE 0.2	●	●	●	●
	RE 0.4	●	●	●	●
	RE 0.8	●	●	●	●
	3.18mm	●	●	●	●
	RE 0.2	●	●	●	●
RE 0.4	●	●	●	●	
3.24mm	●	●	●	●	

● : Standard insert with dimensions

GROOVING / CUTTING OFF

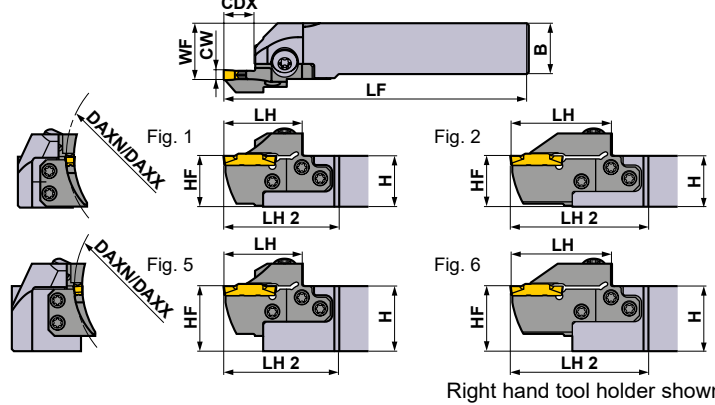
IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F104  
 CAUTION FOR USE > F106

# GY SERIES (FACE GROOVING)

**4** 00° type holder

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>M</sup> <sub>G</sub> <sup>GM</sup> <sub>GFGS</sub>	Insert	GY2M <sup>MM</sup>

Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



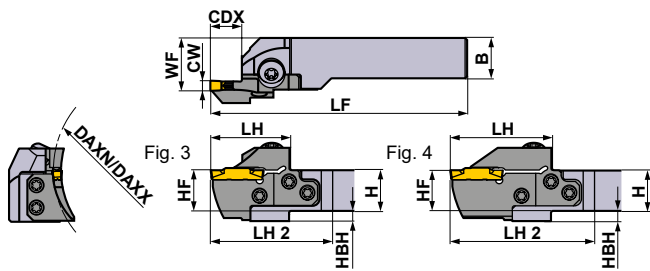
Right hand tool holder shown.

Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
F	3.00 3.18 3.24	180	250	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-180	●	3
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-F12-180	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-180	●	1
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-F12-180	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-F12-180	●	5
					Modular	L	GYHL3225P00-M25L	●	GYM25LD-F12-180	●	5
		20 *2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F20-180	●	4		
			Modular	L	GYHL2020K00-M25L	●	GYM25LD-F20-180	●	4		
			Modular	R	GYHR2525M00-M25R	●	GYM25RD-F20-180	●	2		
			Modular	L	GYHL2525M00-M25L	●	GYM25LD-F20-180	●	2		
			Modular	R	GYHR3225P00-M25R	●	GYM25RD-F20-180	●	6		
			Modular	L	GYHL3225P00-M25L	●	GYM25LD-F20-180	●	6		
	225	999	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-225	●	3	
				Modular	L	GYHL2020K00-M25L	●	GYM25LD-F12-225	●	3	
				Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-225	●	1	
				Modular	L	GYHL2525M00-M25L	●	GYM25LD-F12-225	●	1	
				Modular	R	GYHR3225P00-M25R	●	GYM25RD-F12-225	●	5	
				Modular	L	GYHL3225P00-M25L	●	GYM25LD-F12-225	●	5	
		20 *2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F20-225	●	4		
			Modular	L	GYHL2020K00-M25L	●	GYM25LD-F20-225	●	4		
			Modular	R	GYHR2525M00-M25R	●	GYM25RD-F20-225	●	2		
			Modular	L	GYHL2525M00-M25L	●	GYM25LD-F20-225	●	2		
			Modular	R	GYHR3225P00-M25R	●	GYM25RD-F20-225	●	6		
			Modular	L	GYHL3225P00-M25L	●	GYM25LD-F20-225	●	6		

\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH, LH2, and WF values may vary.  
 \*2 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.

● : Inventory maintained.

GROOVING / CUTTING OFF



\* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS			
Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench *
GYHR/L2020K00-M25R/L			
GYHR/L2525M00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Right hand tool holder shown.

	Dimensions (mm) *1								Cutting Mode
	H	B	LF	LH	LH 2	HF	WF	HBH	
	20	20	125	39	60	20	26	5	<b>R</b> 
	20	20	125	39	60	20	26	5	
	25	25	150	39	57	25	28	—	
	25	25	150	39	57	25	28	—	
	32	25	170	39	57	32	28	—	
	32	25	170	39	57	32	28	—	
	32	32	170	39	57	32	35	—	
	32	32	170	39	57	32	35	—	
	20	20	131	45	66	20	26	5	
	20	20	131	45	66	20	26	5	
	25	25	156	45	63	25	28	—	
	25	25	156	45	63	25	28	—	
	32	25	176	45	63	32	28	—	
	32	25	176	45	63	32	28	—	
	32	32	176	45	63	32	35	—	
	32	32	176	45	63	32	35	—	
	20	20	125	39	60	20	26	5	<b>L</b> 
	20	20	125	39	60	20	26	5	
	25	25	150	39	57	25	28	—	
	25	25	150	39	57	25	28	—	
	32	25	170	39	57	32	28	—	
	32	25	170	39	57	32	28	—	
	32	32	170	39	57	32	35	—	
	32	32	170	39	57	32	35	—	
	20	20	131	45	66	20	26	5	
	20	20	131	45	66	20	26	5	
	25	25	156	45	63	25	28	—	
	25	25	156	45	63	25	28	—	
	32	25	176	45	63	32	28	—	
	32	25	176	45	63	32	28	—	
	32	32	176	45	63	32	35	—	
	32	32	176	45	63	32	35	—	

### Insert selection

Seat Size	Geometry name
F	GY○○0300/0318/0324F○○○○○Breaker shown below

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker CW	GU	GS	GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Hardened steel)
F	3.00mm	●	●	●	●
	3.18mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker CW	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying) Ball shape
F	3.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8			●	
	3.18mm				●
	RE 0.2	●			
	RE 0.4	●			
	3.24mm	●			

● : Standard insert with dimensions

T

GROOVING / CUTTING OFF

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F104  
 CAUTION FOR USE > F106

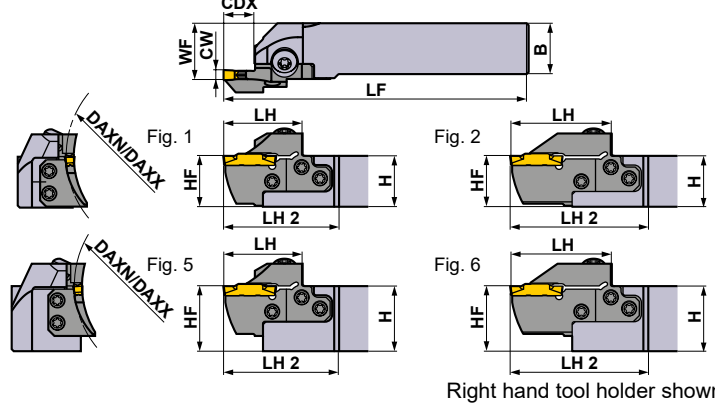
# GY SERIES (FACE GROOVING)

**4** 00° type holder

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>GM</sup> <sub>GFGS</sub>	Insert	GY2M <sup>MM</sup>

Insert **GY2M<sup>BM</sup>**

Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

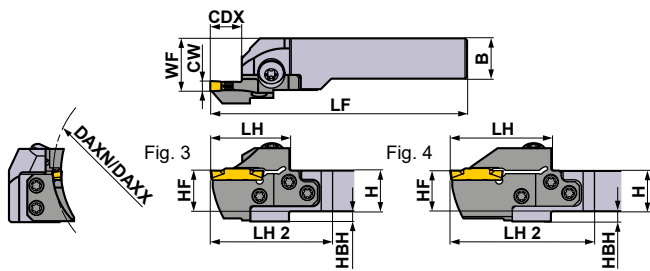


Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.	
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock		
G	4.00	40	50	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-040	●	3	
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-G14-040	●	3	
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-040	●	1	
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-G14-040	●	1	
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-G14-040	●	5	
					Modular	L	GYHL3225P00-M25L	●	GYM25LD-G14-040	●	5	
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-G14-040	●	5	
					Modular	L	GYHL3232P00-M25L	●	GYM25LD-G14-040	●	5	
		4.24	50	60	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-050	●	3
						Modular	L	GYHL2020K00-M25L	●	GYM25LD-G14-050	●	3
						Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-050	●	1
						Modular	L	GYHL2525M00-M25L	●	GYM25LD-G14-050	●	1
						Modular	R	GYHR3225P00-M25R	●	GYM25RD-G14-050	●	5
						Modular	L	GYHL3225P00-M25L	●	GYM25LD-G14-050	●	5
						Modular	R	GYHR3232P00-M25R	●	GYM25RD-G14-050	●	5
						Modular	L	GYHL3232P00-M25L	●	GYM25LD-G14-050	●	5
	60	85	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-060	●	3		
				Modular	L	GYHL2020K00-M25L	●	GYM25LD-G14-060	●	3		
				Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-060	●	1		
				Modular	L	GYHL2525M00-M25L	●	GYM25LD-G14-060	●	1		
25*2			Modular	R	GYHR3225P00-M25R	●	GYM25RD-G14-060	●	5			
			Modular	L	GYHL3225P00-M25L	●	GYM25LD-G14-060	●	5			
			Modular	R	GYHR3232P00-M25R	●	GYM25RD-G14-060	●	5			
			Modular	L	GYHL3232P00-M25L	●	GYM25LD-G14-060	●	5			
25*2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G25-060	●	4					
	Modular	L	GYHL2020K00-M25L	●	GYM25LD-G25-060	●	4					
	Modular	R	GYHR2525M00-M25R	●	GYM25RD-G25-060	●	2					
	Modular	L	GYHL2525M00-M25L	●	GYM25LD-G25-060	●	2					
25*2	Modular	R	GYHR3225P00-M25R	●	GYM25RD-G25-060	●	6					
	Modular	L	GYHL3225P00-M25L	●	GYM25LD-G25-060	●	6					
	Modular	R	GYHR3232P00-M25R	●	GYM25RD-G25-060	●	6					
	Modular	L	GYHL3232P00-M25L	●	GYM25LD-G25-060	●	6					

\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH, LH2, and WF values may vary.  
 \*2 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.

● : Inventory maintained.

GROOVING / CUTTING OFF

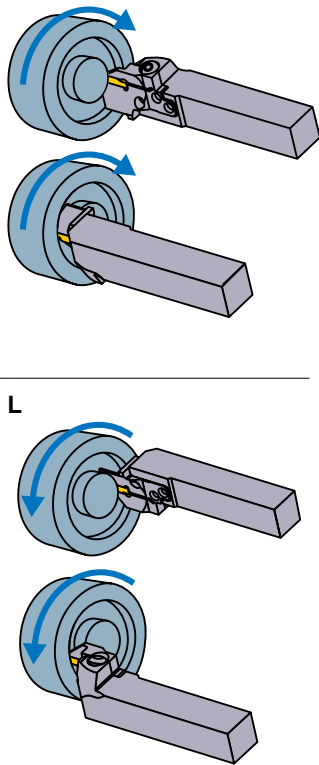


\* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS			
Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench *
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Right hand tool holder shown.

Dimensions (mm) *1									Cutting Mode
H	B	LF	LH	LH 2	HF	WF	HBH		
20	20	125	39	60	20	26	5	R	
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	125	39	60	20	26	5	R	
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	125	39	60	20	26	5	L	
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	136	50	71	20	26	5	L	
20	20	136	50	71	20	26	5		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		



Insert selection

Seat Size	Geometry name
G	GY○○○0400/0424G○○○○○-Breaker shown below

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
G	4.00mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying) Ball shape
G	4.00mm	●	●	●	●
	RE 0.2	●	●	●	●
	RE 0.4	●	●	●	●
	RE 0.8	●	●	●	●
	4.24mm	●			

● : Standard insert with dimensions

GROOVING / CUTTING OFF

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F104  
 CAUTION FOR USE > F106

# GY SERIES (FACE GROOVING)

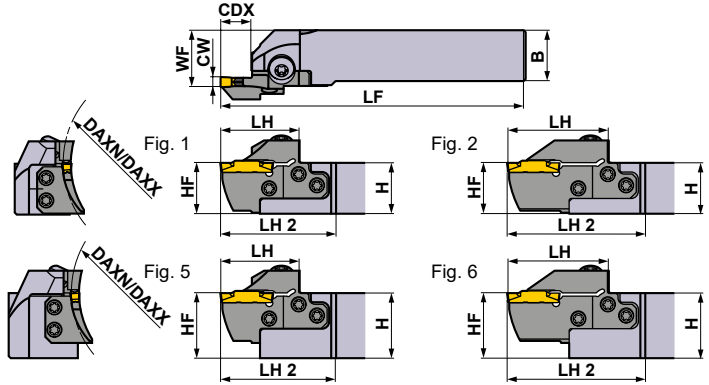
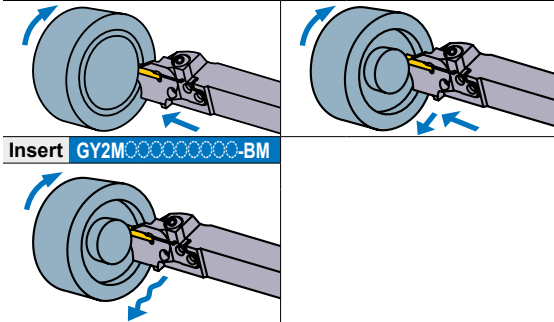
4

00° type holder

Note 1) For modular blades and modular holders, please order separately.

Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>GM</sup> <sub>GFGS</sub>	Insert	GY2M <sup>MM</sup>



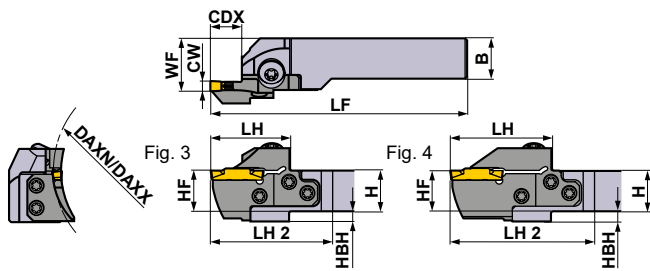
Right hand tool holder shown.

Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
G	4.00	85	125	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-085	●	3
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-G14-085	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-085	●	1
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-G14-085	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-G14-085	●	5
					Modular	L	GYHL3225P00-M25L	●	GYM25LD-G14-085	●	5
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-G14-085	●	5
					Modular	L	GYHL3232P00-M25L	●	GYM25LD-G14-085	●	5
	4.24	125	200	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G25-085	●	4
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-G25-085	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G25-085	●	2
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-G25-085	●	2
				25 *2	Modular	R	GYHR3225P00-M25R	●	GYM25RD-G25-085	●	6
					Modular	L	GYHL3225P00-M25L	●	GYM25LD-G25-085	●	6
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-G25-085	●	6
					Modular	L	GYHL3232P00-M25L	●	GYM25LD-G25-085	●	6
	125	200	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-125	●	3	
				Modular	L	GYHL2020K00-M25L	●	GYM25LD-G14-125	●	3	
				Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-125	●	1	
				Modular	L	GYHL2525M00-M25L	●	GYM25LD-G14-125	●	1	
25 *2			Modular	R	GYHR3225P00-M25R	●	GYM25RD-G14-125	●	5		
			Modular	L	GYHL3225P00-M25L	●	GYM25LD-G14-125	●	5		
			Modular	R	GYHR3232P00-M25R	●	GYM25RD-G14-125	●	5		
			Modular	L	GYHL3232P00-M25L	●	GYM25LD-G14-125	●	5		
25 *2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G25-125	●	4				
	Modular	L	GYHL2020K00-M25L	●	GYM25LD-G25-125	●	4				
	Modular	R	GYHR2525M00-M25R	●	GYM25RD-G25-125	●	2				
	Modular	L	GYHL2525M00-M25L	●	GYM25LD-G25-125	●	2				
25 *2	Modular	R	GYHR3225P00-M25R	●	GYM25RD-G25-125	●	6				
	Modular	L	GYHL3225P00-M25L	●	GYM25LD-G25-125	●	6				
	Modular	R	GYHR3232P00-M25R	●	GYM25RD-G25-125	●	6				
	Modular	L	GYHL3232P00-M25L	●	GYM25LD-G25-125	●	6				

\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH, LH2, and WF values may vary.

\*2 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.

● : Inventory maintained.



\* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS			
Holder		5 pcs.	① ②
	Clamp Screw	Blade Screw	Wrench *
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Right hand tool holder shown.

Dimensions (mm) *1									Cutting Mode
H	B	LF	LH	LH 2	HF	WF	HBH		
20	20	125	39	60	20	26	5	R	
20	20	125	39	60	20	26	5	R	
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		

Insert selection

Seat Size	Geometry name				
G	GY○○0400/0424G○○○○-Breaker shown below				

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
G	4.00mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying) Ball shape
G	4.00mm	●	●	●	●
	RE 0.2	●	●	●	●
	RE 0.4	●	●	●	●
	RE 0.8	●	●	●	●
	4.24mm	●			

● : Standard insert with dimensions

GROOVING / CUTTING OFF

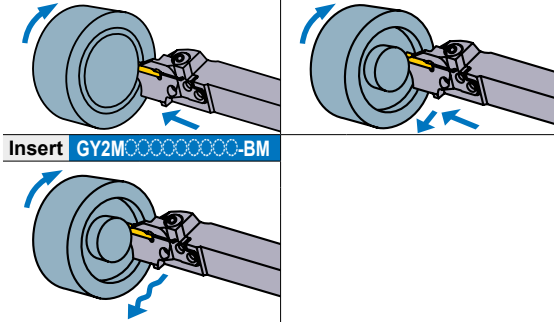
IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F104  
 CAUTION FOR USE > F106

# GY SERIES (FACE GROOVING)

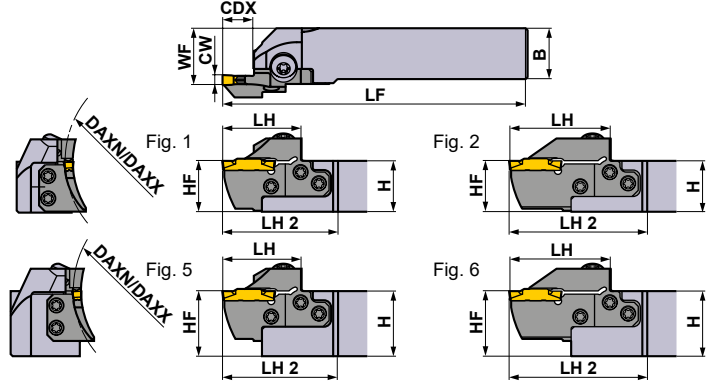
4

00° type holder

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>GM</sup> <sub>GFGS</sub>	Insert	GY2M <sup>MM</sup>



Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



Right hand tool holder shown.

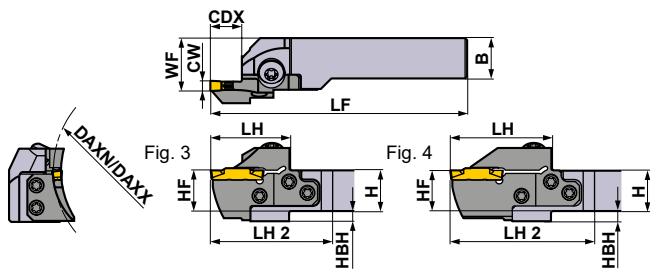
Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
G	4.00	180	280	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-180	●	3
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-G14-180	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-180	●	1
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-G14-180	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-G14-180	●	5
					Modular	L	GYHL3225P00-M25L	●	GYM25LD-G14-180	●	5
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-G14-180	●	5
					Modular	L	GYHL3232P00-M25L	●	GYM25LD-G14-180	●	5
	4.24	250	999	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G25-180	●	4
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-G25-180	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G25-180	●	2
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-G25-180	●	2
				25 *2	Modular	R	GYHR3225P00-M25R	●	GYM25RD-G25-180	●	6
					Modular	L	GYHL3225P00-M25L	●	GYM25LD-G25-180	●	6
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-G25-180	●	6
					Modular	L	GYHL3232P00-M25L	●	GYM25LD-G25-180	●	6
	4.00	250	999	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-250	●	3
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-G14-250	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-250	●	1
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-G14-250	●	1
25 *2				Modular	R	GYHR3225P00-M25R	●	GYM25RD-G14-250	●	5	
				Modular	L	GYHL3225P00-M25L	●	GYM25LD-G14-250	●	5	
				Modular	R	GYHR3232P00-M25R	●	GYM25RD-G14-250	●	5	
				Modular	L	GYHL3232P00-M25L	●	GYM25LD-G14-250	●	5	
4.24	250	999	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G25-250	●	4	
				Modular	L	GYHL2020K00-M25L	●	GYM25LD-G25-250	●	4	
				Modular	R	GYHR2525M00-M25R	●	GYM25RD-G25-250	●	2	
				Modular	L	GYHL2525M00-M25L	●	GYM25LD-G25-250	●	2	
			25 *2	Modular	R	GYHR3225P00-M25R	●	GYM25RD-G25-250	●	6	
				Modular	L	GYHL3225P00-M25L	●	GYM25LD-G25-250	●	6	
				Modular	R	GYHR3232P00-M25R	●	GYM25RD-G25-250	●	6	
				Modular	L	GYHL3232P00-M25L	●	GYM25LD-G25-250	●	6	

\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH, LH2, and WF values may vary.  
 \*2 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.

● : Inventory maintained.

GROOVING / CUTTING OFF



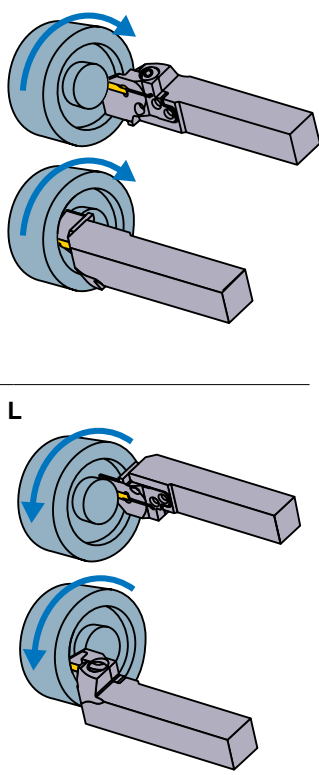


\* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS			
Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench *
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Right hand tool holder shown.

Dimensions (mm) *1									Cutting Mode
H	B	LF	LH	LH 2	HF	WF	HBH		
20	20	125	39	60	20	26	5	R	
20	20	125	39	60	20	26	5	R	
25	25	150	39	57	25	28	—	R	
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—	R	
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—	R	
32	32	170	39	57	32	35	—		
20	20	136	50	71	20	26	5	R	
20	20	136	50	71	20	26	5		
25	25	161	50	68	25	28	—	R	
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—	R	
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—	R	
32	32	181	50	68	32	35	—		
20	20	125	39	60	20	26	5	L	
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—	L	
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—	L	
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—	L	
32	32	170	39	57	32	35	—		
20	20	136	50	71	20	26	5	L	
20	20	136	50	71	20	26	5		
25	25	161	50	68	25	28	—	L	
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—	L	
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—	L	
32	32	181	50	68	32	35	—		



Insert selection

Seat Size	Geometry name
G	GY○○0400/0424G○○○○-Breaker shown below

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
G	4.00mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying) Ball shape
G	4.00mm	●	●	●	●
	RE 0.2	●	●	●	●
	RE 0.4	●	●	●	●
	RE 0.8	●	●	●	●
	4.24mm	●			

● : Standard insert with dimensions

GROOVING / CUTTING OFF

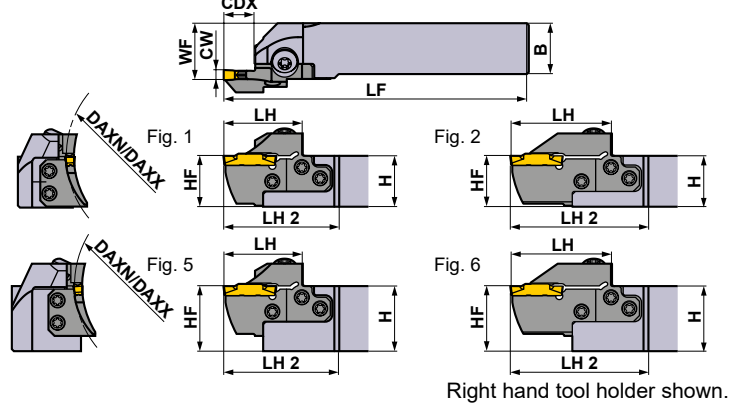
IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F104  
 CAUTION FOR USE > F106

# GY SERIES (FACE GROOVING)

**4** 00° type holder

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>M</sup> <sub>G</sub> <sup>GM</sup> <sub>GFGS</sub>	Insert	GY2M <sup>MM</sup>

Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

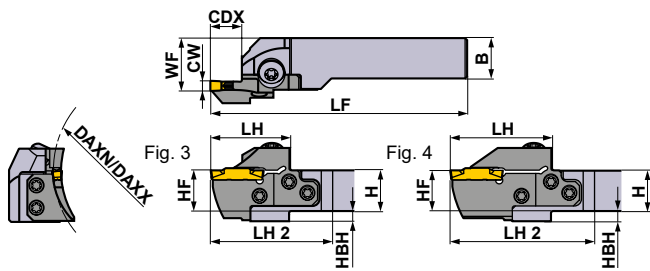


Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
H	4.75 5.00 5.24	50	60	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H14-050	●	3
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-H14-050	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H14-050	●	1
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-H14-050	●	1
		Modular	R	GYHR3225P00-M25R	●	GYM25RD-H14-050	●	5			
		Modular	L	GYHL3225P00-M25L	●	GYM25LD-H14-050	●	5			
		Modular	R	GYHR3232P00-M25R	●	GYM25RD-H14-050	●	5			
		Modular	L	GYHL3232P00-M25L	●	GYM25LD-H14-050	●	5			
	60	85	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H14-060	●	3	
				Modular	L	GYHL2020K00-M25L	●	GYM25LD-H14-060	●	3	
				Modular	R	GYHR2525M00-M25R	●	GYM25RD-H14-060	●	1	
				Modular	L	GYHL2525M00-M25L	●	GYM25LD-H14-060	●	1	
		Modular	R	GYHR3225P00-M25R	●	GYM25RD-H14-060	●	5			
		Modular	L	GYHL3225P00-M25L	●	GYM25LD-H14-060	●	5			
		Modular	R	GYHR3232P00-M25R	●	GYM25RD-H14-060	●	5			
		Modular	L	GYHL3232P00-M25L	●	GYM25LD-H14-060	●	5			
25 *2			Modular	R	GYHR2020K00-M25R	●	GYM25RD-H25-060	●	4		
			Modular	L	GYHL2020K00-M25L	●	GYM25LD-H25-060	●	4		
			Modular	R	GYHR2525M00-M25R	●	GYM25RD-H25-060	●	2		
			Modular	L	GYHL2525M00-M25L	●	GYM25LD-H25-060	●	2		
Modular	R	GYHR3225P00-M25R	●	GYM25RD-H25-060	●	6					
Modular	L	GYHL3225P00-M25L	●	GYM25LD-H25-060	●	6					
Modular	R	GYHR3232P00-M25R	●	GYM25RD-H25-060	●	6					
Modular	L	GYHL3232P00-M25L	●	GYM25LD-H25-060	●	6					

\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH, LH2, and WF values may vary.  
 \*2 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.

● : Inventory maintained.

GROOVING / CUTTING OFF



\* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS			
Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench *
GYHR/L2020K00-M25R/L			
GYHR/L2525M00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Right hand tool holder shown.

	Dimensions (mm) *1								Cutting Mode
	H	B	LF	LH	LH 2	HF	WF	HBH	
	20	20	125	39	60	20	26	5	<b>R</b>
	20	20	125	39	60	20	26	5	
	25	25	150	39	57	25	28	—	
	25	25	150	39	57	25	28	—	
	32	25	170	39	57	32	28	—	
	32	25	170	39	57	32	28	—	
	32	32	170	39	57	32	35	—	
	32	32	170	39	57	32	35	—	
	20	20	125	39	60	20	26	5	<b>L</b>
	20	20	125	39	60	20	26	5	
	25	25	150	39	57	25	28	—	
	25	25	150	39	57	25	28	—	
	32	25	170	39	57	32	28	—	
	32	25	170	39	57	32	28	—	
	32	32	170	39	57	32	35	—	
	32	32	170	39	57	32	35	—	
	20	20	136	50	71	20	26	5	
	20	20	136	50	71	20	26	5	
	25	25	161	50	68	25	28	—	
	25	25	161	50	68	25	28	—	
	32	25	181	50	68	32	28	—	
	32	25	181	50	68	32	28	—	
	32	32	181	50	68	32	35	—	
	32	32	181	50	68	32	35	—	

**Insert selection**

Seat Size	Geometry name	
H	GY	0475/0500/0524H

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker CW	GU	GS	GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Hardened steel)
H	4.75mm	●	●	●	●
	5.00mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker CW	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying)
H	4.75mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			
	5.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	5.24mm	●			

● : Standard insert with dimensions

GROOVING / CUTTING OFF

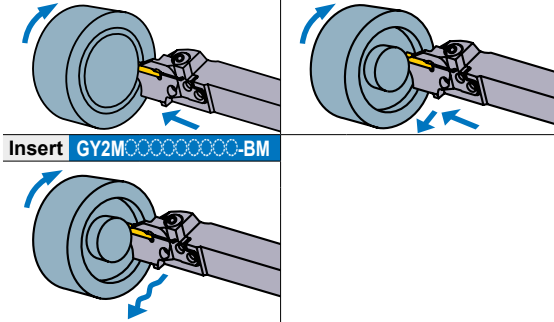
IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F104  
 CAUTION FOR USE > F106

# GY SERIES (FACE GROOVING)

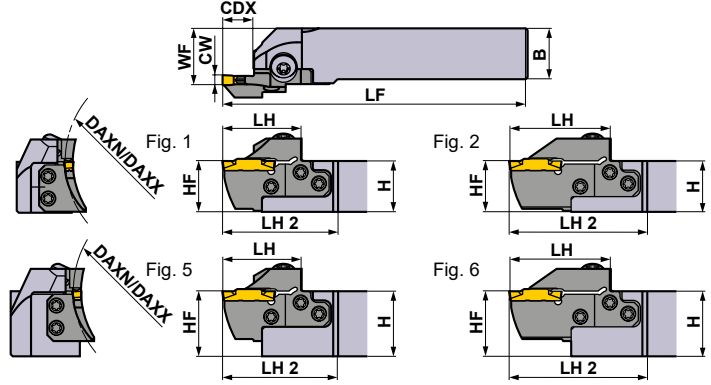
4

00° type holder

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>M</sup> <sub>G</sub> <sup>GM</sup> <sub>GFGS</sub>	Insert	GY2M <sup>MM</sup>



Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



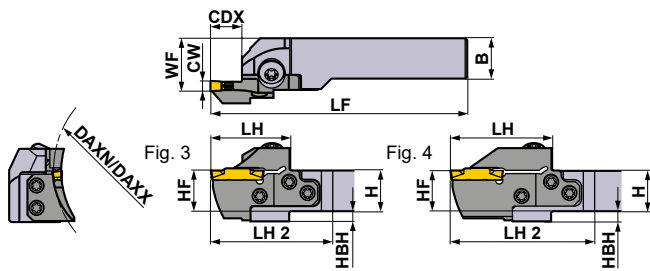
Right hand tool holder shown.

Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
H	4.75 5.00 5.24	85	125	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H14-085	●	3
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-H14-085	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H14-085	●	1
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-H14-085	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-H14-085	●	5
					Modular	L	GYHL3225P00-M25L	●	GYM25LD-H14-085	●	5
		Modular	R	GYHR3232P00-M25R	●	GYM25RD-H14-085	●	5			
		Modular	L	GYHL3232P00-M25L	●	GYM25LD-H14-085	●	5			
		Modular	R	GYHR2020K00-M25R	●	GYM25RD-H25-085	●	4			
		Modular	L	GYHL2020K00-M25L	●	GYM25LD-H25-085	●	4			
		Modular	R	GYHR2525M00-M25R	●	GYM25RD-H25-085	●	2			
		Modular	L	GYHL2525M00-M25L	●	GYM25LD-H25-085	●	2			
	Modular	R	GYHR3225P00-M25R	●	GYM25RD-H25-085	●	6				
	Modular	L	GYHL3225P00-M25L	●	GYM25LD-H25-085	●	6				
	Modular	R	GYHR3232P00-M25R	●	GYM25RD-H25-085	●	6				
	Modular	L	GYHL3232P00-M25L	●	GYM25LD-H25-085	●	6				
	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H14-125	●	3				
	Modular	L	GYHL2020K00-M25L	●	GYM25LD-H14-125	●	3				
	Modular	R	GYHR2525M00-M25R	●	GYM25RD-H14-125	●	1				
	Modular	L	GYHL2525M00-M25L	●	GYM25LD-H14-125	●	1				
	Modular	R	GYHR3225P00-M25R	●	GYM25RD-H14-125	●	5				
	Modular	L	GYHL3225P00-M25L	●	GYM25LD-H14-125	●	5				
	Modular	R	GYHR3232P00-M25R	●	GYM25RD-H14-125	●	5				
	Modular	L	GYHL3232P00-M25L	●	GYM25LD-H14-125	●	5				
Modular	R	GYHR2020K00-M25R	●	GYM25RD-H25-125	●	4					
Modular	L	GYHL2020K00-M25L	●	GYM25LD-H25-125	●	4					
Modular	R	GYHR2525M00-M25R	●	GYM25RD-H25-125	●	2					
Modular	L	GYHL2525M00-M25L	●	GYM25LD-H25-125	●	2					
Modular	R	GYHR3225P00-M25R	●	GYM25RD-H25-125	●	6					
Modular	L	GYHL3225P00-M25L	●	GYM25LD-H25-125	●	6					
Modular	R	GYHR3232P00-M25R	●	GYM25RD-H25-125	●	6					
Modular	L	GYHL3232P00-M25L	●	GYM25LD-H25-125	●	6					

\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH, LH2, and WF values may vary.  
 \*2 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.

● : Inventory maintained.

GROOVING / CUTTING OFF

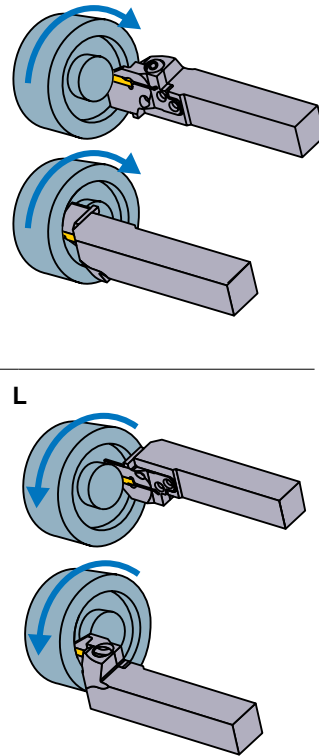


\* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS			
Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench *
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Right hand tool holder shown.

Dimensions (mm) *1									Cutting Mode
H	B	LF	LH	LH 2	HF	WF	HBH		
20	20	125	39	60	20	26	5	R	
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		



### Insert selection

Seat Size	Geometry name
H	GY○○0475/0500/0524H○○○○○Breaker shown below

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker	GU	GS	GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Hardened steel)
H	4.75mm	●	●	●	●
	5.00mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying)
H	4.75mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			
	5.00mm				●
	RE 0.2	●			
RE 0.4	●	●	●		
RE 0.8	●	●	●		
5.24mm	●				

● : Standard insert with dimensions

GROOVING / CUTTING OFF

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F104  
 CAUTION FOR USE > F106

# GY SERIES (FACE GROOVING)

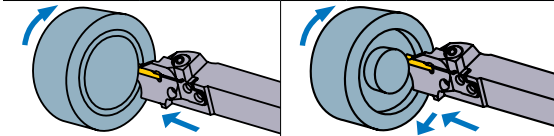
4

00° type holder

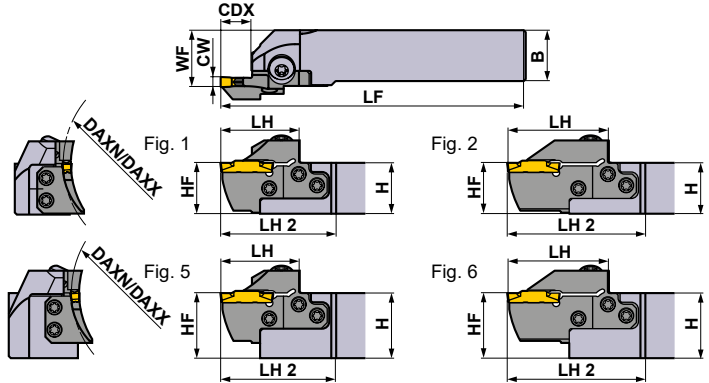
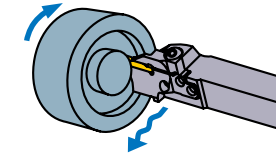
Note 1) For modular blades and modular holders, please order separately.

Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>GM</sup> <sub>GFGS</sub>	Insert	GY2M <sup>MM</sup>



Insert GY2M<sup>BM</sup>



Right hand tool holder shown.

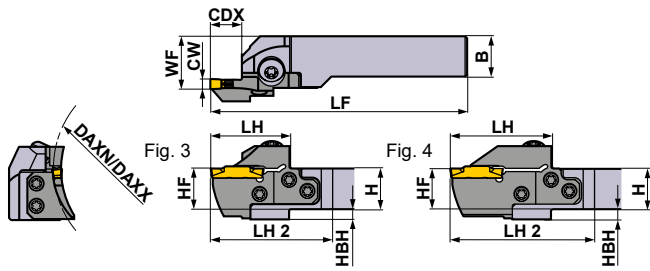
Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
H	4.75 5.00 5.24	180	280	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H14-180	●	3
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-H14-180	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H14-180	●	1
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-H14-180	●	1
				Modular	R	GYHR3225P00-M25R	●	GYM25RD-H14-180	●	5	
				Modular	L	GYHL3225P00-M25L	●	GYM25LD-H14-180	●	5	
				Modular	R	GYHR3232P00-M25R	●	GYM25RD-H14-180	●	5	
				Modular	L	GYHL3232P00-M25L	●	GYM25LD-H14-180	●	5	
	25 *2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H25-180	●	4			
		Modular	L	GYHL2020K00-M25L	●	GYM25LD-H25-180	●	4			
		Modular	R	GYHR2525M00-M25R	●	GYM25RD-H25-180	●	2			
		Modular	L	GYHL2525M00-M25L	●	GYM25LD-H25-180	●	2			
		Modular	R	GYHR3225P00-M25R	●	GYM25RD-H25-180	●	6			
		Modular	L	GYHL3225P00-M25L	●	GYM25LD-H25-180	●	6			
		Modular	R	GYHR3232P00-M25R	●	GYM25RD-H25-180	●	6			
		Modular	L	GYHL3232P00-M25L	●	GYM25LD-H25-180	●	6			
250	999	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H14-250	●	3		
			Modular	L	GYHL2020K00-M25L	●	GYM25LD-H14-250	●	3		
			Modular	R	GYHR2525M00-M25R	●	GYM25RD-H14-250	●	1		
			Modular	L	GYHL2525M00-M25L	●	GYM25LD-H14-250	●	1		
		Modular	R	GYHR3225P00-M25R	●	GYM25RD-H14-250	●	5			
		Modular	L	GYHL3225P00-M25L	●	GYM25LD-H14-250	●	5			
		Modular	R	GYHR3232P00-M25R	●	GYM25RD-H14-250	●	5			
		Modular	L	GYHL3232P00-M25L	●	GYM25LD-H14-250	●	5			
25 *2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H25-250	●	4				
	Modular	L	GYHL2020K00-M25L	●	GYM25LD-H25-250	●	4				
	Modular	R	GYHR2525M00-M25R	●	GYM25RD-H25-250	●	2				
	Modular	L	GYHL2525M00-M25L	●	GYM25LD-H25-250	●	2				
Modular	R	GYHR3225P00-M25R	●	GYM25RD-H25-250	●	6					
Modular	L	GYHL3225P00-M25L	●	GYM25LD-H25-250	●	6					
Modular	R	GYHR3232P00-M25R	●	GYM25RD-H25-250	●	6					
Modular	L	GYHL3232P00-M25L	●	GYM25LD-H25-250	●	6					

\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH, LH2, and WF values may vary.

\*2 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.

● : Inventory maintained.

GROOVING / CUTTING OFF



\* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS			
Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench *
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Right hand tool holder shown.

Dimensions (mm) *1									Cutting Mode
H	B	LF	LH	LH 2	HF	WF	HBH		
20	20	125	39	60	20	26	5	R	
20	20	125	39	60	20	26	5	R	
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		

### Insert selection

Seat Size	Geometry name
H	GY○○0475/0500/0524H○○○○○Breaker shown below

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker	GU	GS	GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Hardened steel)
H	4.75mm	●	●	●	●
	5.00mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying)
H	4.75mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			
	5.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	5.24mm	●			

● : Standard insert with dimensions

GROOVING / CUTTING OFF

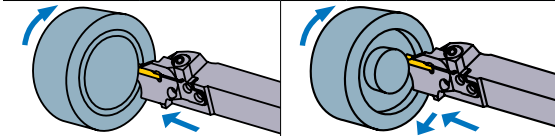
IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F104  
 CAUTION FOR USE > F106

# GY SERIES (FACE GROOVING)

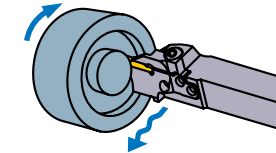
4

00° type holder

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1G <sup>GFGS</sup>	Insert	GY2M <sup>MM</sup>

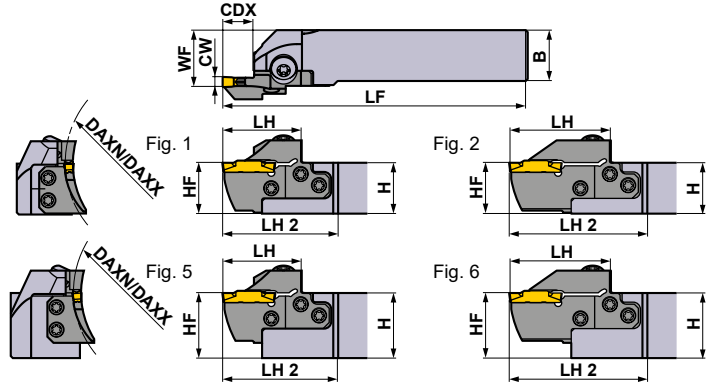


Insert GY2M<sup>BM</sup>



Note 1) For modular blades and modular holders, please order separately.

Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



Right hand tool holder shown.

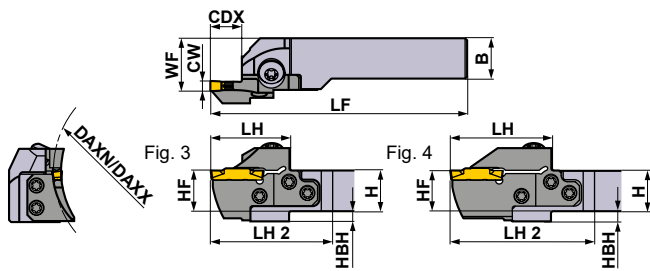
Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
J	6.00 6.31 6.35	50	70	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J14-050	●	3
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-J14-050	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J14-050	●	1
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-J14-050	●	1
		Modular	R	GYHR3225P00-M25R	●	GYM25RD-J14-050	●	5			
		Modular	L	GYHL3225P00-M25L	●	GYM25LD-J14-050	●	5			
		Modular	R	GYHR3232P00-M25R	●	GYM25RD-J14-050	●	5			
		Modular	L	GYHL3232P00-M25L	●	GYM25LD-J14-050	●	5			
		Modular	R	GYHR2020K00-M25R	●	GYM25RD-J14-070	●	3			
		Modular	L	GYHL2020K00-M25L	●	GYM25LD-J14-070	●	3			
		Modular	R	GYHR2525M00-M25R	●	GYM25RD-J14-070	●	1			
		Modular	L	GYHL2525M00-M25L	●	GYM25LD-J14-070	●	1			
	Modular	R	GYHR3225P00-M25R	●	GYM25RD-J14-070	●	5				
	Modular	L	GYHL3225P00-M25L	●	GYM25LD-J14-070	●	5				
	Modular	R	GYHR3232P00-M25R	●	GYM25RD-J14-070	●	5				
	Modular	L	GYHL3232P00-M25L	●	GYM25LD-J14-070	●	5				
	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J25-070	●	4				
	Modular	L	GYHL2020K00-M25L	●	GYM25LD-J25-070	●	4				
	Modular	R	GYHR2525M00-M25R	●	GYM25RD-J25-070	●	2				
	Modular	L	GYHL2525M00-M25L	●	GYM25LD-J25-070	●	2				
	Modular	R	GYHR3225P00-M25R	●	GYM25RD-J25-070	●	6				
	Modular	L	GYHL3225P00-M25L	●	GYM25LD-J25-070	●	6				
	Modular	R	GYHR3232P00-M25R	●	GYM25RD-J25-070	●	6				
	Modular	L	GYHL3232P00-M25L	●	GYM25LD-J25-070	●	6				
Modular	R	GYHR2020K00-M25R	●	GYM25RD-J14-110	●	3					
Modular	L	GYHL2020K00-M25L	●	GYM25LD-J14-110	●	3					
Modular	R	GYHR2525M00-M25R	●	GYM25RD-J14-110	●	1					
Modular	L	GYHL2525M00-M25L	●	GYM25LD-J14-110	●	1					
Modular	R	GYHR3225P00-M25R	●	GYM25RD-J14-110	●	5					
Modular	L	GYHL3225P00-M25L	●	GYM25LD-J14-110	●	5					
Modular	R	GYHR3232P00-M25R	●	GYM25RD-J14-110	●	5					
Modular	L	GYHL3232P00-M25L	●	GYM25LD-J14-110	●	5					
Modular	R	GYHR2020K00-M25R	●	GYM25RD-J25-110	●	4					
Modular	L	GYHL2020K00-M25L	●	GYM25LD-J25-110	●	4					
Modular	R	GYHR2525M00-M25R	●	GYM25RD-J25-110	●	2					
Modular	L	GYHL2525M00-M25L	●	GYM25LD-J25-110	●	2					
Modular	R	GYHR3225P00-M25R	●	GYM25RD-J25-110	●	6					
Modular	L	GYHL3225P00-M25L	●	GYM25LD-J25-110	●	6					
Modular	R	GYHR3232P00-M25R	●	GYM25RD-J25-110	●	6					
Modular	L	GYHL3232P00-M25L	●	GYM25LD-J25-110	●	6					

\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH, LH2, and WF values may vary.

\*2 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.

● : Inventory maintained.



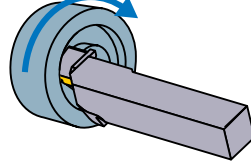
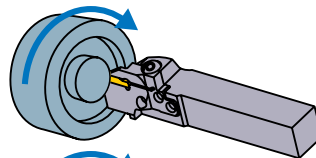


\* Wrench : ① : Clamp Screw, ② : Blade Screw

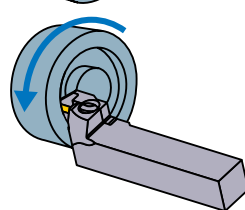
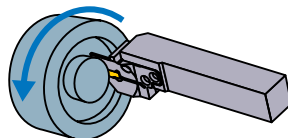
SPARE PARTS			
Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench *
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Right hand tool holder shown.

Dimensions (mm) *1									Cutting Mode
H	B	LF	LH	LH 2	HF	WF	HBH		
20	20	125	39	60	20	26	5	R	
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		



L



### Insert selection

Seat Size	Geometry name
J	GY○○0600/0631/0635J○○○○○-Breaker shown below

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker CW	GU	GS	GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Hardened steel)
J	6.00mm	●	●	●	●
	6.35mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker CW	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying) Ball shape
J	6.00mm	●			●
	RE 0.2	●		●	
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	6.31mm	●			
	6.35mm	●			●
	RE 0.2	●			
	RE 0.4	●			
RE 0.8	●				

● : Standard insert with dimensions

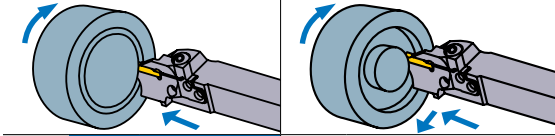
IDENTIFICATION > F008, F009  
CUTTING CONDITIONS > F104  
CAUTION FOR USE > F106

# GY SERIES (FACE GROOVING)

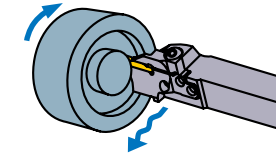
4

00° type holder

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1G <sup>GFGS</sup>	Insert	GY2M <sup>MM</sup>

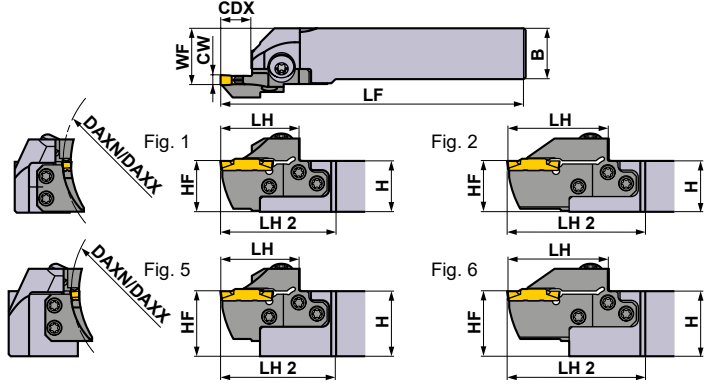


Insert GY2M<sup>BM</sup>



Note 1) For modular blades and modular holders, please order separately.

Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



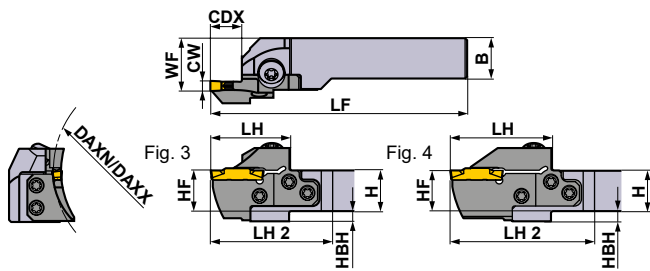
Right hand tool holder shown.

Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
J	6.00 6.31 6.35	170	280	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J14-170	●	3
					Modular	L	GYHL2020K00-M25L	●	GYM25LD-J14-170	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J14-170	●	1
					Modular	L	GYHL2525M00-M25L	●	GYM25LD-J14-170	●	1
				Modular	R	GYHR3225P00-M25R	●	GYM25RD-J14-170	●	5	
				Modular	L	GYHL3225P00-M25L	●	GYM25LD-J14-170	●	5	
				Modular	R	GYHR3232P00-M25R	●	GYM25RD-J14-170	●	5	
				Modular	L	GYHL3232P00-M25L	●	GYM25LD-J14-170	●	5	
	25 *2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J25-170	●	4			
		Modular	L	GYHL2020K00-M25L	●	GYM25LD-J25-170	●	4			
		Modular	R	GYHR2525M00-M25R	●	GYM25RD-J25-170	●	2			
		Modular	L	GYHL2525M00-M25L	●	GYM25LD-J25-170	●	2			
		Modular	R	GYHR3225P00-M25R	●	GYM25RD-J25-170	●	6			
		Modular	L	GYHL3225P00-M25L	●	GYM25LD-J25-170	●	6			
		Modular	R	GYHR3232P00-M25R	●	GYM25RD-J25-170	●	6			
		Modular	L	GYHL3232P00-M25L	●	GYM25LD-J25-170	●	6			
250	999	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J14-250	●	3		
			Modular	L	GYHL2020K00-M25L	●	GYM25LD-J14-250	●	3		
			Modular	R	GYHR2525M00-M25R	●	GYM25RD-J14-250	●	1		
			Modular	L	GYHL2525M00-M25L	●	GYM25LD-J14-250	●	1		
		Modular	R	GYHR3225P00-M25R	●	GYM25RD-J14-250	●	5			
		Modular	L	GYHL3225P00-M25L	●	GYM25LD-J14-250	●	5			
		Modular	R	GYHR3232P00-M25R	●	GYM25RD-J14-250	●	5			
		Modular	L	GYHL3232P00-M25L	●	GYM25LD-J14-250	●	5			
25 *2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J25-250	●	4				
	Modular	L	GYHL2020K00-M25L	●	GYM25LD-J25-250	●	4				
	Modular	R	GYHR2525M00-M25R	●	GYM25RD-J25-250	●	2				
	Modular	L	GYHL2525M00-M25L	●	GYM25LD-J25-250	●	2				
Modular	R	GYHR3225P00-M25R	●	GYM25RD-J25-250	●	6					
Modular	L	GYHL3225P00-M25L	●	GYM25LD-J25-250	●	6					
Modular	R	GYHR3232P00-M25R	●	GYM25RD-J25-250	●	6					
Modular	L	GYHL3232P00-M25L	●	GYM25LD-J25-250	●	6					

\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH, LH2, and WF values may vary.

\*2 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.

● : Inventory maintained.

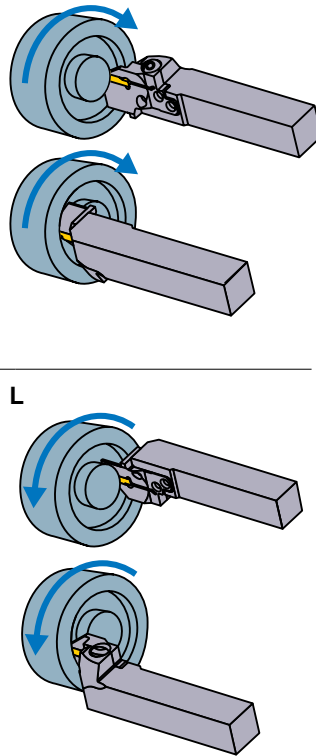


\* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS			
Holder	Clamp Screw	Blade Screw 5 pcs.	Wrench *
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Right hand tool holder shown.

Dimensions (mm) *1									Cutting Mode
H	B	LF	LH	LH 2	HF	WF	HBH		
20	20	125	39	60	20	26	5	R	
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—	R	
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	136	50	71	20	26	5	L	
20	20	136	50	71	20	26	5		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		



### Insert selection

Seat Size	Geometry name
J	GY○○0600/0631/0635J○○○○-Breaker shown below

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
J	6.00mm	●	●	●	●
	6.35mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying) Ball shape
J	6.00mm				●
	RE 0.2	●			
	RE 0.4	●	●		
	RE 0.8	●	●	●	
	6.31mm	●			
	6.35mm	●			●
	RE 0.2	●			
	RE 0.4	●			
RE 0.8	●				

● : Standard insert with dimensions

IDENTIFICATION > F008, F009  
CUTTING CONDITIONS > F104  
CAUTION FOR USE > F106

# GY SERIES (FACE GROOVING)

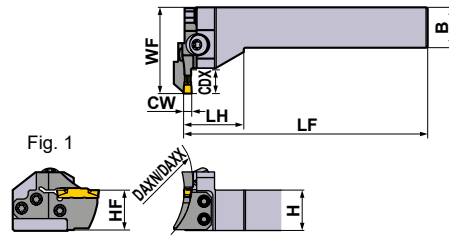
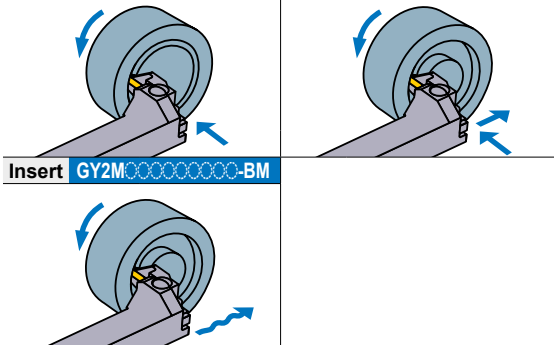
5

90° type holder

Note 1) For modular blades and modular holders, please order separately.

Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>GM</sup> <sub>GFGS</sub>	Insert	GY2M <sup>MM</sup>



Right hand tool holder shown.

Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
D	2.00 2.24	40	50	12	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LD-D12-040 GYM25RD-D12-040	● ●	1 1
		50	60	12	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LD-D12-050 GYM25RD-D12-050	● ●	1 1
		60	75	12	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LD-D12-060 GYM25RD-D12-060	● ●	1 1
		75	100	12	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LD-D12-075 GYM25RD-D12-075	● ●	1 1
		100	150	12	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LD-D12-100 GYM25RD-D12-100	● ●	1 1
		135	200	12	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LD-D12-135 GYM25RD-D12-135	● ●	1 1
		180	250	12	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LD-D12-180 GYM25RD-D12-180	● ●	1 1
E	2.39 2.50 2.74	40	50	12	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LD-E12-040 GYM25RD-E12-040	● ●	1 1
		50	60	12	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LD-E12-050 GYM25RD-E12-050	● ●	1 1
		60	75	12	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LD-E12-060 GYM25RD-E12-060	● ●	1 1
		75	100	12	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LD-E12-075 GYM25RD-E12-075	● ●	1 1
		100	150	12	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LD-E12-100 GYM25RD-E12-100	● ●	1 1
		135	200	12	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LD-E12-135 GYM25RD-E12-135	● ●	1 1
		180	250	12	Modular	R L	GYHR2525M90-M25L GYHL2525M90-M25R	● ●	GYM25LD-E12-180 GYM25RD-E12-180	● ●	1 1

\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH and WF values may vary.

● : Inventory maintained.



# GY SERIES (FACE GROOVING)

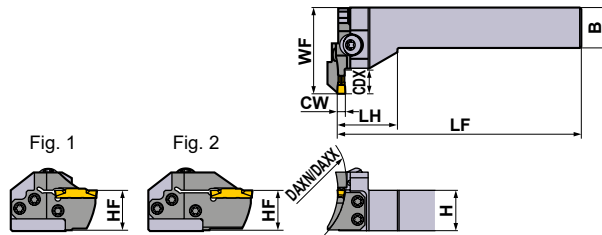
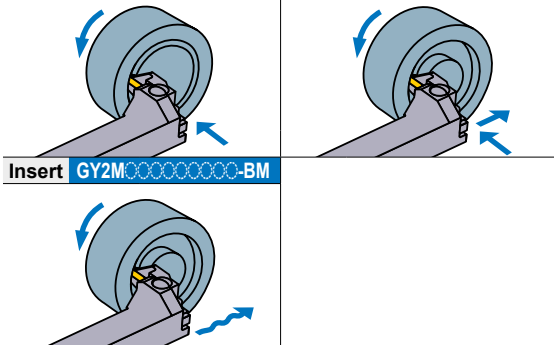
5

90° type holder

Note 1) For modular blades and modular holders, please order separately.

Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>GM</sup> <sub>GFGS</sub>	Insert	GY2M <sup>MM</sup>



Right hand tool holder shown.

Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number				Fig.	
	CW	DAXN	DAXX			CDX	Holder	Stock	Modular Blade		Stock
F	3.00 3.18 3.24	35	40	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-035	●	1
				L	GYHL2525M90-M25R	●	GYM25RD-F12-035	●	1		
		40	50	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-040	●	1
				L	GYHL2525M90-M25R	●	GYM25RD-F12-040	●	1		
		50	60	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-050	●	1
				L	GYHL2525M90-M25R	●	GYM25RD-F12-050	●	1		
		60	75	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-060	●	1
				L	GYHL2525M90-M25R	●	GYM25RD-F12-060	●	1		
				20 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-060	●	2
				L	GYHL2525M90-M25R	●	GYM25RD-F20-060	●	2		
		75	100	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-075	●	1
				L	GYHL2525M90-M25R	●	GYM25RD-F12-075	●	1		
				20 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-075	●	2
				L	GYHL2525M90-M25R	●	GYM25RD-F20-075	●	2		
		100	150	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-100	●	1
				L	GYHL2525M90-M25R	●	GYM25RD-F12-100	●	1		
				20 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-100	●	2
				L	GYHL2525M90-M25R	●	GYM25RD-F20-100	●	2		
135	200	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-135	●	1		
		L	GYHL2525M90-M25R	●	GYM25RD-F12-135	●	1				
		20 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-135	●	2		
		L	GYHL2525M90-M25R	●	GYM25RD-F20-135	●	2				
180	250	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-180	●	1		
		L	GYHL2525M90-M25R	●	GYM25RD-F12-180	●	1				
		20 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-180	●	2		
		L	GYHL2525M90-M25R	●	GYM25RD-F20-180	●	2				
225	999	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-225	●	1		
		L	GYHL2525M90-M25R	●	GYM25RD-F12-225	●	1				
		20 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-225	●	2		
		L	GYHL2525M90-M25R	●	GYM25RD-F20-225	●	2				

\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH and WF values may vary.

\*2 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012–F015.

● : Inventory maintained.



# GY SERIES (FACE GROOVING)

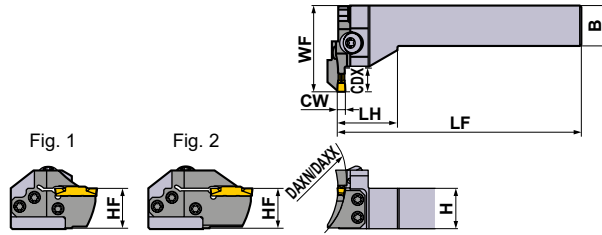
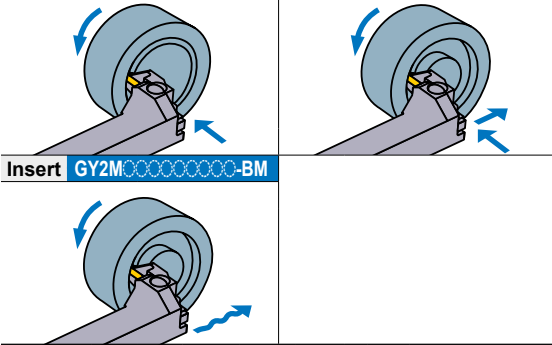
5

90° type holder

Note 1) For modular blades and modular holders, please order separately.

Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>GM</sup> <sub>GFGS</sub>	Insert	GY2M <sup>MM</sup>



Right hand tool holder shown.

Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
G	4.00 4.24	40	50	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-040	●	1
				L	GYHL2525M90-M25R	●	GYM25RD-G14-040	●	1		
		50	60	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-050	●	1
				L	GYHL2525M90-M25R	●	GYM25RD-G14-050	●	1		
		60	85	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-060	●	1
				L	GYHL2525M90-M25R	●	GYM25RD-G14-060	●	1		
		25 *2			Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-060	●	2
					L	GYHL2525M90-M25R	●	GYM25RD-G25-060	●	2	
		85	125	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-085	●	1
				L	GYHL2525M90-M25R	●	GYM25RD-G14-085	●	1		
		25 *2			Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-085	●	2
					L	GYHL2525M90-M25R	●	GYM25RD-G25-085	●	2	
		125	200	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-125	●	1
				L	GYHL2525M90-M25R	●	GYM25RD-G14-125	●	1		
		25 *2			Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-125	●	2
					L	GYHL2525M90-M25R	●	GYM25RD-G25-125	●	2	
180	280	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-180	●	1		
		L	GYHL2525M90-M25R	●	GYM25RD-G14-180	●	1				
25 *2			Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-180	●	2		
			L	GYHL2525M90-M25R	●	GYM25RD-G25-180	●	2			
250	999	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-250	●	1		
		L	GYHL2525M90-M25R	●	GYM25RD-G14-250	●	1				
25 *2			Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-250	●	2		
			L	GYHL2525M90-M25R	●	GYM25RD-G25-250	●	2			




\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH and WF values may vary.

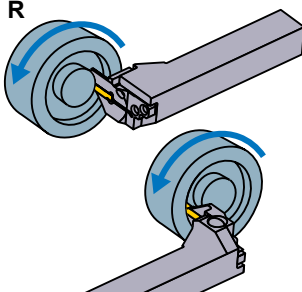
\*2 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.

● : Inventory maintained.



\* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS			
Holder		 5 pcs.	
	Clamp Screw	Blade Screw	Wrench *
<b>GYHR2525M90-M25L</b>	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
<b>GYHL2525M90-M25R</b>			

	Dimensions (mm) *1						Cutting Mode
	H	B	LF	LH	HF	WF	
	25	25	150	38	25	53	<b>R</b> 
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	

**Insert selection**

Seat Size	Geometry name				
G	GY○○0400/0424G○○○-Breaker shown below				

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
G	4.00mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying) Ball shape
G	4.00mm				●
	RE 0.2	●	●	●	
	RE 0.4	●	●	●	
	RE 0.8	●		●	
	4.24mm	●			

● : Standard insert with dimensions

GROOVING / CUTTING OFF

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F104  
 CAUTION FOR USE > F106

# GY SERIES (FACE GROOVING)

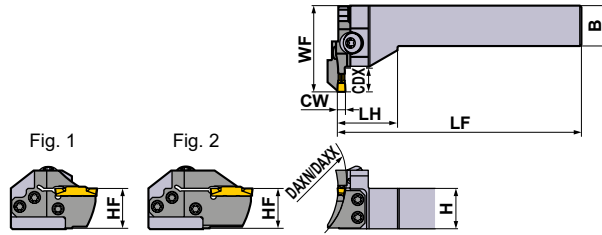
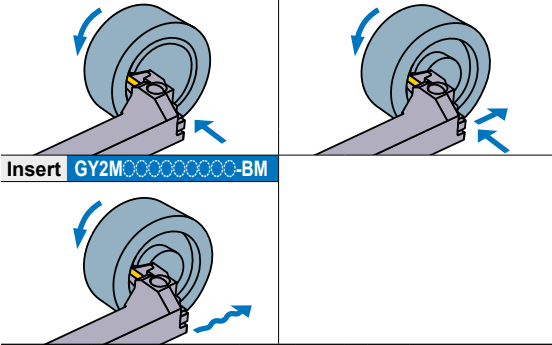
5

90° type holder

Note 1) For modular blades and modular holders, please order separately.

Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>GM</sup> <sub>GFGS</sub>	Insert	GY2M <sup>MM</sup>



Right hand tool holder shown.




Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
H	4.75 5.00 5.24	50	60	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-050	●	1
				L	GYHL2525M90-M25R	●	GYM25RD-H14-050	●	1		
		60	85	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-060	●	1
				L	GYHL2525M90-M25R	●	GYM25RD-H14-060	●	1		
		25 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-060	●	2		
				L	GYHL2525M90-M25R	●	GYM25RD-H25-060	●	2		
		85	125	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-085	●	1
				L	GYHL2525M90-M25R	●	GYM25RD-H14-085	●	1		
		25 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-085	●	2		
				L	GYHL2525M90-M25R	●	GYM25RD-H25-085	●	2		
		125	200	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-125	●	1
				L	GYHL2525M90-M25R	●	GYM25RD-H14-125	●	1		
		25 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-125	●	2		
				L	GYHL2525M90-M25R	●	GYM25RD-H25-125	●	2		
		180	280	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-180	●	1
				L	GYHL2525M90-M25R	●	GYM25RD-H14-180	●	1		
25 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-180	●	2				
		L	GYHL2525M90-M25R	●	GYM25RD-H25-180	●	2				
250	999	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-250	●	1		
		L	GYHL2525M90-M25R	●	GYM25RD-H14-250	●	1				
25 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-250	●	2				
		L	GYHL2525M90-M25R	●	GYM25RD-H25-250	●	2				

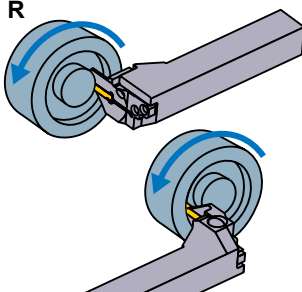
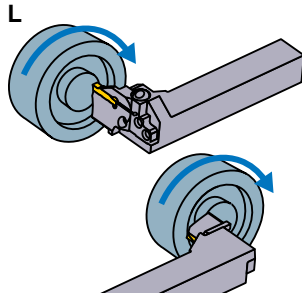
\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH and WF values may vary.

\*2 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.

● : Inventory maintained.

\* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS			
Holder		 5 pcs.	
	Clamp Screw	Blade Screw	Wrench *
<b>GYHR2525M90-M25L</b>	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
<b>GYHL2525M90-M25R</b>			

	Dimensions (mm) *1						Cutting Mode
	H	B	LF	LH	HF	WF	
	25	25	150	38	25	53	<b>R</b> 
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
	25	25	150	38	25	53	<b>L</b> 
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
	25	25	150	38	25	53	
	25	25	150	38	25	53	

**Insert selection**

Seat Size	Geometry name
H	GY○○0475/0500/0524H○○○○○Breaker shown below

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker	GU	GS	GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Hardened steel)
H	4.75mm	●	●	●	●
	5.00mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying)
H	4.75mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			
	5.00mm				●
	RE 0.2	●			
H	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	5.24mm	●			

● : Standard insert with dimensions

GROOVING / CUTTING OFF

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F104  
 CAUTION FOR USE > F106

# GY SERIES (FACE GROOVING)

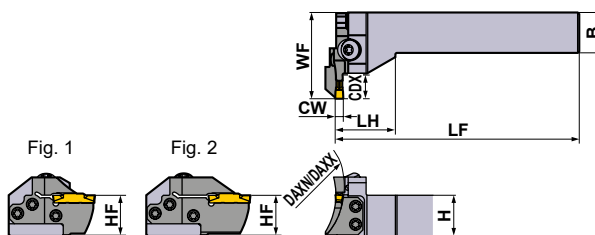
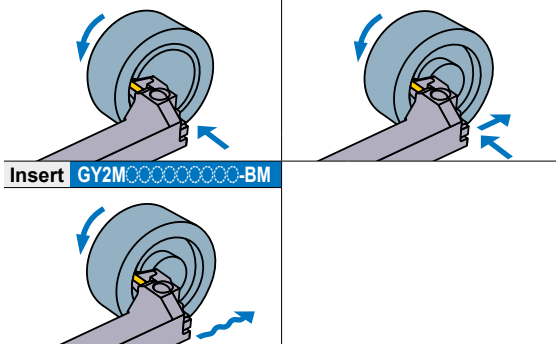
5

90° type holder

Note 1) For modular blades and modular holders, please order separately.

Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

Insert	GY2M <sup>GS</sup> <sub>GM</sub>	Insert	GY2G <sup>MF</sup>
Insert	GY2M <sup>GU</sup>	Insert	GY2M <sup>MS</sup>
Insert	GY1 <sup>GM</sup> <sub>GFGS</sub>	Insert	GY2M <sup>MM</sup>



Right hand tool holder shown.




Seat Size	Dimensions (mm)				Type	Hand (R/L)	Order Number				Fig.
	CW	DAXN	DAXX	CDX			Holder	Stock	Modular Blade	Stock	
J	6.00 6.31 6.35	50	70	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-050	●	1
				L	GYHL2525M90-M25R	●	GYM25RD-J14-050	●	1		
		70	110	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-070	●	1
				L	GYHL2525M90-M25R	●	GYM25RD-J14-070	●	1		
		110	200	25 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J25-070	●	2
				L	GYHL2525M90-M25R	●	GYM25RD-J25-070	●	2		
	170	280	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-110	●	1	
			L	GYHL2525M90-M25R	●	GYM25RD-J14-110	●	1			
	250	999	25 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J25-110	●	2	
			L	GYHL2525M90-M25R	●	GYM25RD-J25-110	●	2			
	250	999	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-170	●	1	
			L	GYHL2525M90-M25R	●	GYM25RD-J14-170	●	1			
250	999	25 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J25-170	●	2		
		L	GYHL2525M90-M25R	●	GYM25RD-J25-170	●	2				
250	999	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-250	●	1		
		L	GYHL2525M90-M25R	●	GYM25RD-J14-250	●	1				
250	999	25 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J25-250	●	2		
		L	GYHL2525M90-M25R	●	GYM25RD-J25-250	●	2				

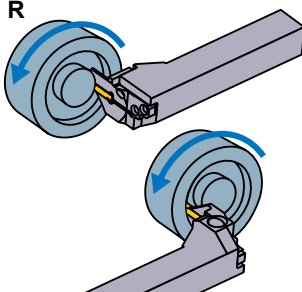
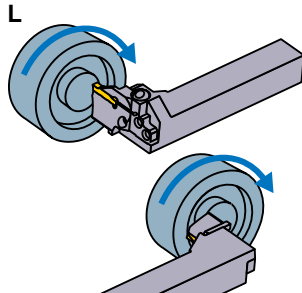
\*1 Dimensions shown are when standard insert is used. If other insert geometries are used then LF, LH and WF values may vary.

\*2 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F012—F015.

● : Inventory maintained.

\* Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS			
Holder		 5 pcs.	
	Clamp Screw	Blade Screw	Wrench *
<b>GYHR2525M90-M25L</b>	GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
<b>GYHL2525M90-M25R</b>			

	Dimensions (mm) *1						Cutting Mode
	H	B	LF	LH	HF	WF	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	

### Insert selection

Seat Size	Geometry name
J	GY○○0600/0631/0635J○○○○-Breaker shown below

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker	GU	GS	GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Hardened steel)
J	6.00mm	●	●	●	●
	6.35mm	●	●	●	●

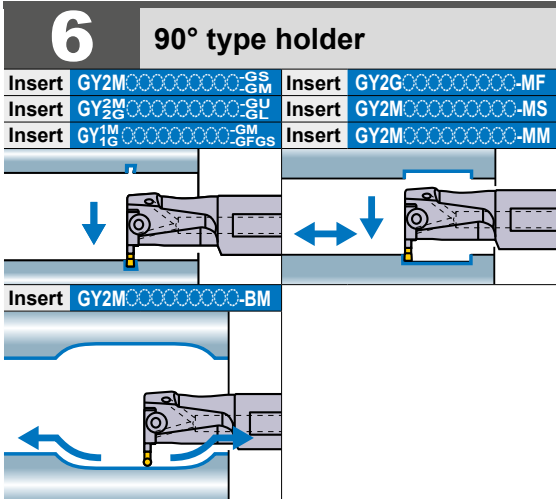
For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying)
J	6.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	6.31mm	●			
	6.35mm				●
	RE 0.2	●			
	RE 0.4	●			
RE 0.8	●				

● : Standard insert with dimensions

GROOVING / CUTTING OFF

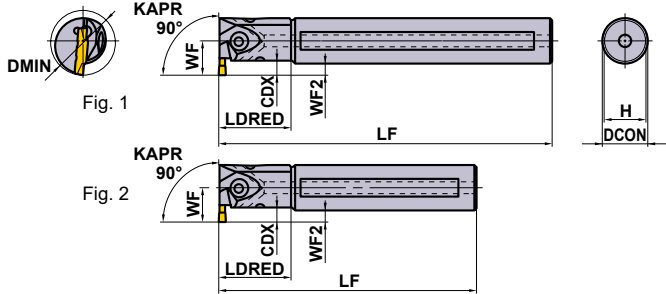
IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F104  
 CAUTION FOR USE > F106

# GY SERIES (INTERNAL GROOVING)



Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

● Monoblock type (Air / coolant through)



Right hand tool holder shown.

Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number				Fig.
	CW	CDX *3	DMIN			Holder	Stock	Modular Blade	Stock	
D	2.00 2.24	6	25	Monoblock	R	<b>GYAR20K90A-D06</b>	●	—	—	2
				Monoblock	L	<b>GYAL20K90A-D06</b>	●	—	—	2
			Monoblock	R	<b>GYAR20Q90A-D06</b>	●	—	—	1	
			Monoblock	L	<b>GYAL20Q90A-D06</b>	●	—	—	1	
		32	Monoblock	R	<b>GYAR25K90B-D06</b>	●	—	—	—	2
			Monoblock	L	<b>GYAL25K90B-D06</b>	●	—	—	—	2
		4—9.5 *1	40	Modular	R	<b>GYDR32L90C-M20L</b>	●	<b>GYM20LA-D10</b>	●	4
				Modular	L	<b>GYDL32L90C-M20R</b>	●	<b>GYM20RA-D10</b>	●	4
			Modular	R	<b>GYDR32S90C-M20L</b>	●	<b>GYM20LA-D10</b>	●	3	
			Modular	L	<b>GYDL32S90C-M20R</b>	●	<b>GYM20RA-D10</b>	●	3	
		5.5—9.5 *1	50	Modular	R	<b>GYDR40M90D-M20L</b>	●	<b>GYM20LA-D10</b>	●	4
				Modular	L	<b>GYDL40M90D-M20R</b>	●	<b>GYM20RA-D10</b>	●	4
	Modular		R	<b>GYDR40T90D-M20L</b>	●	<b>GYM20LA-D10</b>	●	3		
	Modular		L	<b>GYDL40T90D-M20R</b>	●	<b>GYM20RA-D10</b>	●	3		
	7—11.5 *1	60	Modular	R	<b>GYDR40M90D-M25L</b>	●	<b>GYM25LA-D12</b>	●	4	
			Modular	L	<b>GYDL40M90D-M25R</b>	●	<b>GYM25RA-D12</b>	●	4	
		Modular	R	<b>GYDR40T90D-M25L</b>	●	<b>GYM25LA-D12</b>	●	3		
		Modular	L	<b>GYDL40T90D-M25R</b>	●	<b>GYM25RA-D12</b>	●	3		
		70	Modular	R	<b>GYDR50P90F-M25L</b>	●	<b>GYM25LA-D12</b>	●	4	
			Modular	L	<b>GYDL50P90F-M25R</b>	●	<b>GYM25RA-D12</b>	●	4	
			Modular	R	<b>GYDR50T90F-M25L</b>	●	<b>GYM25LA-D12</b>	●	3	
			Modular	L	<b>GYDL50T90F-M25R</b>	●	<b>GYM25RA-D12</b>	●	3	

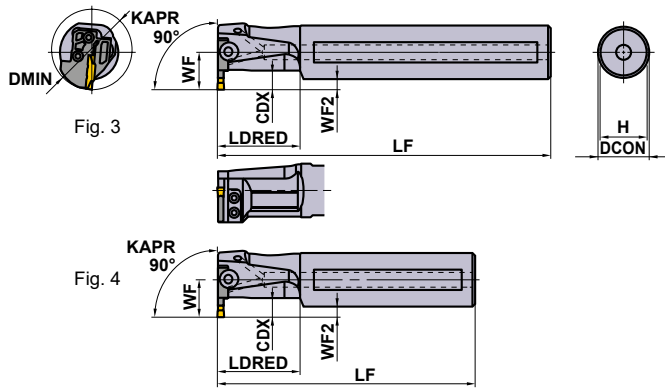
\*1 The maximum groove depth (CDX) varies according to the cutting diameter (DMIN). For details, please refer to page F111.  
 \*2 Dimensions shown are when the standard insert is used. If other insert geometries are used then LF, LDRED, WF and WF2 values may vary.  
 \*3 The maximum groove depth (CDX) is a value within the dimension LDRED.

● : Inventory maintained.

GROOVING / CUTTING OFF

●Modular blade type (Air / coolant through)

\* Wrench : ① : Clamp Screw, ② : Blade Screw

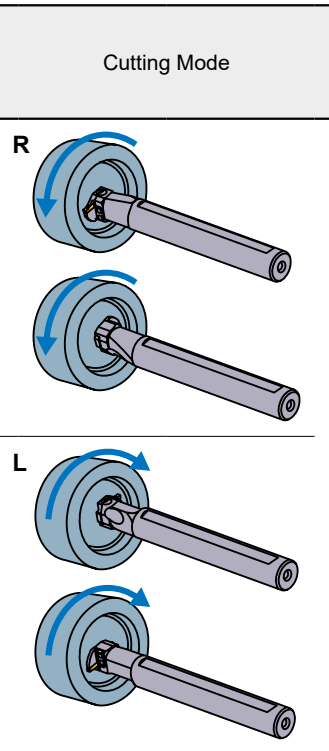


Right hand tool holder shown.

**SPARE PARTS**

Holder	① Clamp Screw	② Blade Screw 4 pcs.	① Wrench *
<b>GYAR/L20○90A-○06</b>	①GY05016S (Clamp Torque : 5.0N·m)	—	①TKY20R
<b>GYAR/L25○90B-○06</b>	①GY05016S (Clamp Torque : 5.0N·m)	—	①TKY20R
<b>GYDR/L32○90C-M20L/R</b>	②GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
<b>GYDR/L40○90D-M20L/R</b>	②GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
<b>GYDR/L40○90D-M25L/R</b>	②GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
<b>GYDR/L50○90F-M25L/R</b>	②GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D

	Dimensions (mm) *2						Cutting Mode
	DCON	LF	LDRED	WF	WF2	H	
	20	125	30	14.5	4.5	18	<b>R</b>
	20	125	30	14.5	4.5	18	
	20	180	30	14.5	4.5	18	
	20	180	30	14.5	4.5	18	
	25	125	40	19	6.5	23	<b>R</b>
	25	125	40	19	6.5	23	
	25	200	40	19	6.5	23	
	25	200	40	19	6.5	23	
	32	140	50	22	6	30	<b>L</b>
	32	140	50	22	6	30	
	32	250	50	22	6	30	
	32	250	50	22	6	30	
	40	150	60	28	8	37	<b>L</b>
	40	150	60	28	8	37	
	40	300	60	28	8	37	
	40	300	60	28	8	37	
	40	150	60	28	8	37	
	40	150	60	28	8	37	
	40	300	60	28	8	37	
	40	300	60	28	8	37	
	40	300	60	28	8	37	
	40	300	60	28	8	37	
	50	170	80	34	9	47	
	50	170	80	34	9	47	
	50	300	80	34	9	47	
	50	300	80	34	9	47	



**Insert selection**

Seat Size	Geometry name
D	GY○○0200/0224D○○○○○-Breaker shown below

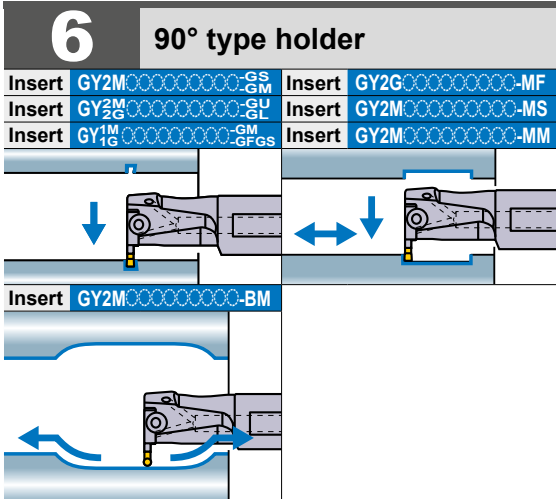
For grooving/cutting off breaker > F012, F013						
Seat Size	Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GL (Aluminium alloy)	GFGS (Hardened steel)
D	2.00mm	●	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
D	2.00mm	●	●	●	●
	2.24mm	●	●	●	●

● : Standard insert with dimensions

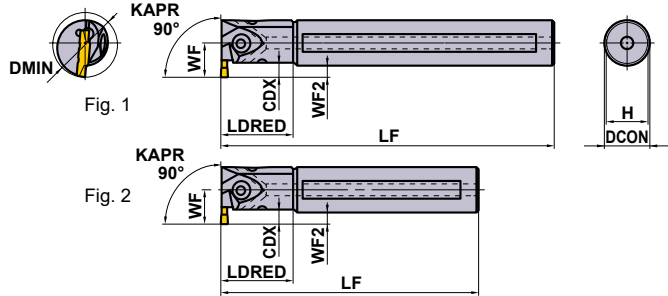
IDENTIFICATION > F008, F009  
CUTTING CONDITIONS > F110  
CAUTION FOR USE > F112

# GY SERIES (INTERNAL GROOVING)



Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

● Monoblock type (Air / coolant through)



Right hand tool holder shown.

Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number				Fig.	
	CW	CDX *3	DMIN			Holder	Stock	Modular Blade	Stock		
E	2.39	6	25	Monoblock	R	<b>GYAR20K90A-E06</b>	●	—	—	2	
				Monoblock	L	<b>GYAL20K90A-E06</b>	●	—	—	2	
			Monoblock	R	<b>GYAR20Q90A-E06</b>	●	—	—	1		
			Monoblock	L	<b>GYAL20Q90A-E06</b>	●	—	—	1		
		32	Monoblock	R	<b>GYAR25K90B-E06</b>	●	—	—	2		
			Monoblock	L	<b>GYAL25K90B-E06</b>	●	—	—	2		
		2.50	4—9.5 *1	40	Modular	R	<b>GYDR32L90C-M20L</b>	●	<b>GYM20LA-E10</b>	●	4
					Modular	L	<b>GYDL32L90C-M20R</b>	●	<b>GYM20RA-E10</b>	●	4
	2.74		5.5—9.5 *1	50	Modular	R	<b>GYDR32S90C-M20L</b>	●	<b>GYM20LA-E10</b>	●	3
					Modular	L	<b>GYDL32S90C-M20R</b>	●	<b>GYM20RA-E10</b>	●	3
			60	Modular	R	<b>GYDR40M90D-M20L</b>	●	<b>GYM20LA-E10</b>	●	4	
				Modular	L	<b>GYDL40M90D-M20R</b>	●	<b>GYM20RA-E10</b>	●	4	
	7—11.5 *1	60	60	Modular	R	<b>GYDR40T90D-M20L</b>	●	<b>GYM20LA-E10</b>	●	3	
				Modular	L	<b>GYDL40T90D-M20R</b>	●	<b>GYM20RA-E10</b>	●	3	
		70	70	Modular	R	<b>GYDR40M90D-M25L</b>	●	<b>GYM25LA-E12</b>	●	4	
				Modular	L	<b>GYDL40M90D-M25R</b>	●	<b>GYM25RA-E12</b>	●	4	
		70	70	Modular	R	<b>GYDR40T90D-M25L</b>	●	<b>GYM25LA-E12</b>	●	3	
				Modular	L	<b>GYDL40T90D-M25R</b>	●	<b>GYM25RA-E12</b>	●	3	
70	70	70	Modular	R	<b>GYDR50P90F-M25L</b>	●	<b>GYM25LA-E12</b>	●	4		
			Modular	L	<b>GYDL50P90F-M25R</b>	●	<b>GYM25RA-E12</b>	●	4		
70	70	70	Modular	R	<b>GYDR50T90F-M25L</b>	●	<b>GYM25LA-E12</b>	●	3		
			Modular	L	<b>GYDL50T90F-M25R</b>	●	<b>GYM25RA-E12</b>	●	3		

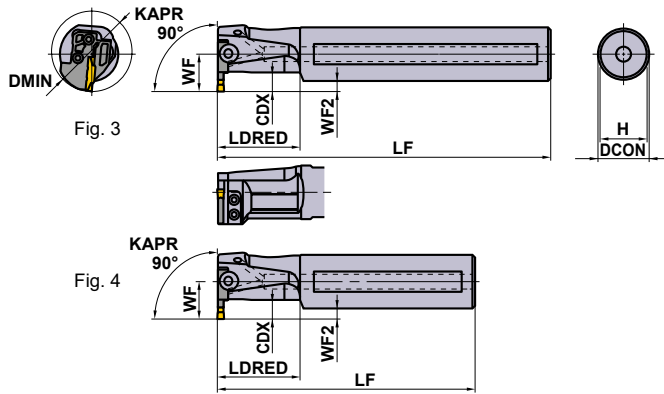
\*1 The maximum groove depth (CDX) varies according to the cutting diameter (DMIN). For details, please refer to page F111.  
 \*2 Dimensions shown are when the standard insert is used. If other insert geometries are used then LF, LDRED, WF and WF2 values may vary.  
 \*3 The maximum groove depth (CDX) is a value within the dimension LDRED.

● : Inventory maintained.



●Modular blade type (Air / coolant through)

\* Wrench : ① : Clamp Screw, ② : Blade Screw

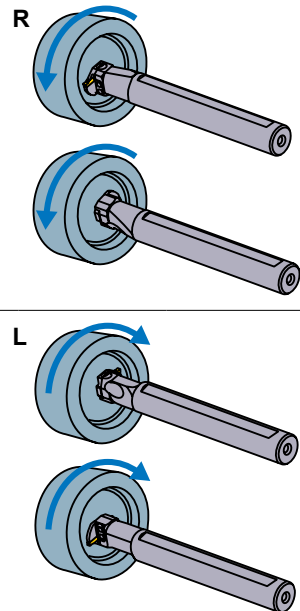


**SPARE PARTS**

Holder	① Clamp Screw	② Blade Screw 4 pcs.	① Wrench *
<b>GYAR/L20○90A-○06</b>	①GY05016S (Clamp Torque : 5.0N·m)	—	①TKY20R
<b>GYAR/L25○90B-○06</b>	①GY05016S (Clamp Torque : 5.0N·m)	—	①TKY20R
<b>GYDR/L32○90C-M20L/R</b>	②GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
<b>GYDR/L40○90D-M20L/R</b>	②GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
<b>GYDR/L40○90D-M25L/R</b>	②GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
<b>GYDR/L50○90F-M25L/R</b>	②GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D

Right hand tool holder shown.

	Dimensions (mm) *2						Cutting Mode
	DCON	LF	LDRED	WF	WF2	H	
	20	125	30	14.5	4.5	18	R
	20	125	30	14.5	4.5	18	
	20	180	30	14.5	4.5	18	
	20	180	30	14.5	4.5	18	
	25	125	40	19	6.5	23	L
	25	125	40	19	6.5	23	
	25	200	40	19	6.5	23	
	25	200	40	19	6.5	23	
	32	140	50	22	6	30	L
	32	140	50	22	6	30	
	32	250	50	22	6	30	
	32	250	50	22	6	30	
	40	150	60	28	8	37	L
	40	150	60	28	8	37	
	40	300	60	28	8	37	
	40	300	60	28	8	37	
	40	150	60	28	8	37	L
	40	150	60	28	8	37	
	40	300	60	28	8	37	
	40	300	60	28	8	37	
	50	170	80	34	9	47	L
	50	170	80	34	9	47	
	50	300	80	34	9	47	
	50	300	80	34	9	47	



**Insert selection**

Seat Size	Geometry name
E	GY○○0239/0250/0274E○○○○○-Breaker shown below

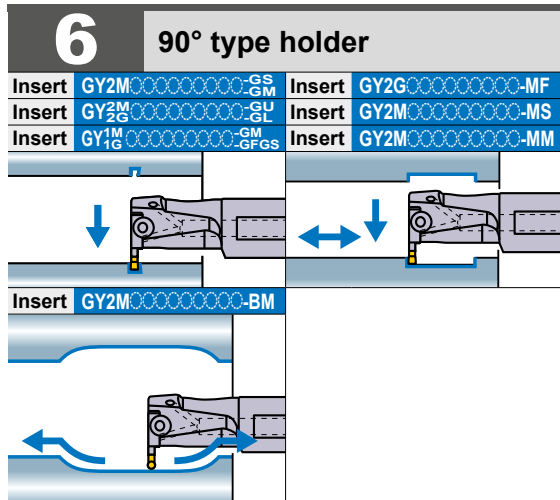
For grooving/cutting off breaker > F012, F013						
Seat Size	Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GL (Aluminium alloy)	GFGS (Hardened steel)
E	CW					
		2.39mm	●	●	●	●
		2.50mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying) Ball nose
E	CW				
		2.39mm	●		
		2.50mm	●	●	
		2.74mm	●		

● : Standard insert with dimensions

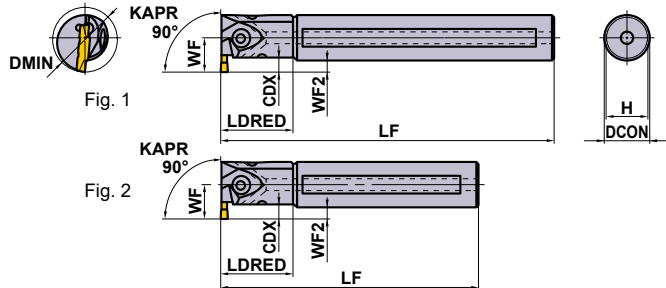
IDENTIFICATION > F008, F009  
CUTTING CONDITIONS > F110  
CAUTION FOR USE > F112

# GY SERIES (INTERNAL GROOVING)



Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

● Monoblock type (Air / coolant through)



Right hand tool holder shown.

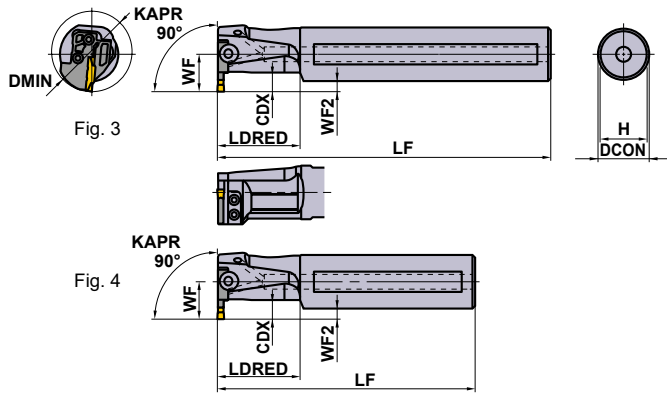
Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number				Fig.
	CW	CDX *3	DMIN			Holder	Stock	Modular Blade	Stock	
F	3.00 3.18 3.24	6	25	Monoblock	R	GYAR20K90A-F06	●	—	—	2
				Monoblock	L	GYAL20K90A-F06	●	—	—	2
				Monoblock	R	GYAR20Q90A-F06	●	—	—	1
				Monoblock	L	GYAL20Q90A-F06	●	—	—	1
			Monoblock	R	GYAR25K90B-F06	●	—	—	2	
			Monoblock	L	GYAL25K90B-F06	●	—	—	2	
		4—9.5 *1	40	Modular	R	GYDR32L90C-M20L	●	GYM20LA-F10	●	4
				Modular	L	GYDL32L90C-M20R	●	GYM20RA-F10	●	4
			Modular	R	GYDR32S90C-M20L	●	GYM20LA-F10	●	3	
				L	GYDL32S90C-M20R	●	GYM20RA-F10	●	3	
			50	Modular	R	GYDR40M90D-M20L	●	GYM20LA-F10	●	4
				Modular	L	GYDL40M90D-M20R	●	GYM20RA-F10	●	4
	7—11.5 *1	60	Modular	R	GYDR40T90D-M20L	●	GYM20LA-F10	●	3	
			Modular	L	GYDL40T90D-M20R	●	GYM20RA-F10	●	3	
		Modular	R	GYDR40M90D-M25L	●	GYM25LA-F12	●	4		
			L	GYDL40M90D-M25R	●	GYM25RA-F12	●	4		
		70	Modular	R	GYDR40T90D-M25L	●	GYM25LA-F12	●	3	
			Modular	L	GYDL40T90D-M25R	●	GYM25RA-F12	●	3	
G	4.00 4.24	7	Monoblock	R	GYAR25K90B-G07	●	—	—	2	
			Monoblock	L	GYAL25K90B-G07	●	—	—	2	
			Monoblock	R	GYAR25R90B-G07	●	—	—	1	
			Monoblock	L	GYAL25R90B-G07	●	—	—	1	
		4.5—11.5 *1	40	Modular	R	GYDR32L90C-M20L	●	GYM20LA-G12	●	4
				Modular	L	GYDL32L90C-M20R	●	GYM20RA-G12	●	4
			Modular	R	GYDR32S90C-M20L	●	GYM20LA-G12	●	3	
				L	GYDL32S90C-M20R	●	GYM20RA-G12	●	3	
		6—11.5 *1	50	Modular	R	GYDR40M90D-M20L	●	GYM20LA-G12	●	4
				Modular	L	GYDL40M90D-M20R	●	GYM20RA-G12	●	4
			Modular	R	GYDR40T90D-M20L	●	GYM20LA-G12	●	3	
				L	GYDL40T90D-M20R	●	GYM20RA-G12	●	3	
	7.5—13 *1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-G14	●	4	
			Modular	L	GYDL40M90D-M25R	●	GYM25RA-G14	●	4	
		Modular	R	GYDR40T90D-M25L	●	GYM25LA-G14	●	3		
			L	GYDL40T90D-M25R	●	GYM25RA-G14	●	3		
		70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-G14	●	4	
			Modular	L	GYDL50P90F-M25R	●	GYM25RA-G14	●	4	
Modular	R	GYDR50T90F-M25L	●	GYM25LA-G14	●	3				
	L	GYDL50T90F-M25R	●	GYM25RA-G14	●	3				

\*1 The maximum groove depth (CDX) varies according to the cutting diameter (DMIN). For details, please refer to page F111.  
 \*2 Dimensions shown are when the standard insert is used. If other insert geometries are used then LF, LDRED, WF and WF2 values may vary.  
 \*3 The maximum groove depth (CDX) is a value within the dimension LDRED.

● : Inventory maintained.

●Modular blade type (Air / coolant through)

\* Wrench : ① : Clamp Screw, ② : Blade Screw

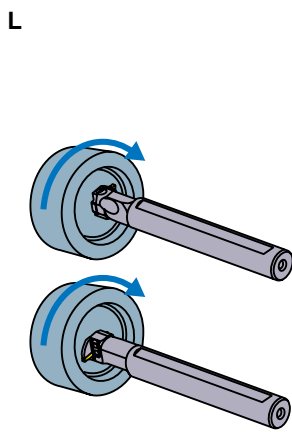
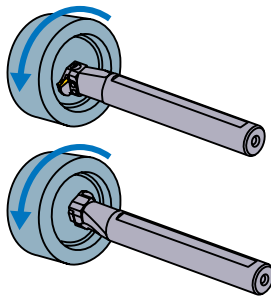


**SPARE PARTS**

Holder	① Clamp Screw	② Blade Screw 4 pcs.	① Wrench *
<b>GYAR/L20</b> ○90A-F06	①GY05016S (Clamp Torque : 5.0N·m)	—	①TKY20R
<b>GYAR/L25</b> ○90B-○○○	—	—	—
<b>GYDR/L32</b> ○90C-M20L/R	②GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
<b>GYDR/L40</b> ○90D-M20L/R	②GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
<b>GYDR/L40</b> ○90D-M25L/R	②GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
<b>GYDR/L50</b> ○90F-M25L/R	②GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D

Right hand tool holder shown.

	Dimensions (mm) *2						Cutting Mode
	DCON	LF	LDRED	WF	WF2	H	
	20	125	30	14.5	4.5	18	R
	20	125	30	14.5	4.5	18	
	20	180	30	14.5	4.5	18	
	20	180	30	14.5	4.5	18	
	25	125	40	19	6.5	23	
	25	125	40	19	6.5	23	
	25	200	40	19	6.5	23	
	25	200	40	19	6.5	23	
	32	140	50	22	6	30	
	32	140	50	22	6	30	
	32	250	50	22	6	30	
	32	250	50	22	6	30	
	40	150	60	28	8	37	
	40	150	60	28	8	37	
	40	300	60	28	8	37	
	40	300	60	28	8	37	
	40	150	60	28	8	37	
	40	150	60	28	8	37	
	40	300	60	28	8	37	
	40	300	60	28	8	37	
	50	170	80	34	9	47	
	50	170	80	34	9	47	
	50	300	80	34	9	47	
	50	300	80	34	9	47	
	25	125	40	19	6.5	23	
	25	125	40	19	6.5	23	
	25	200	40	19	6.5	23	
	25	200	40	19	6.5	23	
	32	140	50	22	6	30	
	32	140	50	22	6	30	
	32	250	50	22	6	30	
	32	250	50	22	6	30	
	40	150	60	28	8	37	
	40	150	60	28	8	37	
	40	300	60	28	8	37	
	40	300	60	28	8	37	
	40	150	60	28	8	37	
	40	150	60	28	8	37	
	40	300	60	28	8	37	
	40	300	60	28	8	37	
	50	170	80	34	9	47	
	50	170	80	34	9	47	
	50	300	80	34	9	47	
	50	300	80	34	9	47	



**Insert selection**

Seat Size	Geometry name
F	GY○○0300/0318/0324F○○○○○-Breaker shown below

For grooving/cutting off breaker > F012, F013						
Seat Size	Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GL (Aluminium alloy)	GFGS (Hardened steel)
F	CW					
		3.00mm	●	●	●	●
		3.18mm	●	●	●	●

For multifunctional grooving breaker > F014, F015						
Seat Size	Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)	
F	CW				Ball nose	
		3.00mm				●
		RE 0.2	●	●	●	
		RE 0.4	●	●	●	
		RE 0.8			●	
		3.18mm				●
		RE 0.2	●			
		RE 0.4	●			
		3.24mm	●			

Seat Size	Geometry name
G	GY○○0400/0424G○○○○○-Breaker shown below

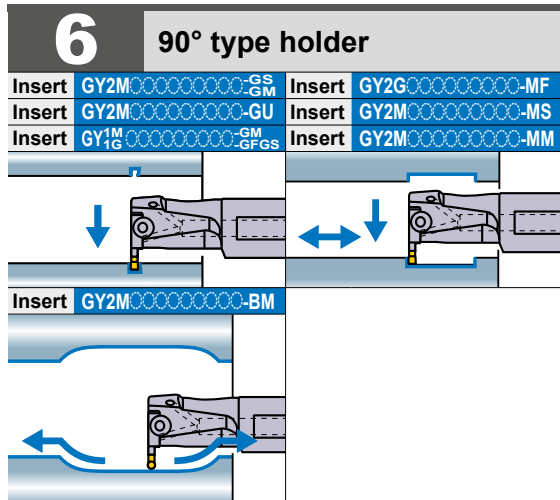
For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker	GU (For gummy steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
G	CW				
		4.00mm	●	●	●

For multifunctional grooving breaker > F014, F015						
Seat Size	Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)	
G	CW				Ball nose	
		4.00mm				●
		RE 0.2	●	●	●	
		RE 0.4	●	●	●	
		RE 0.8	●		●	
		4.24mm	●			

● : Standard insert with dimensions

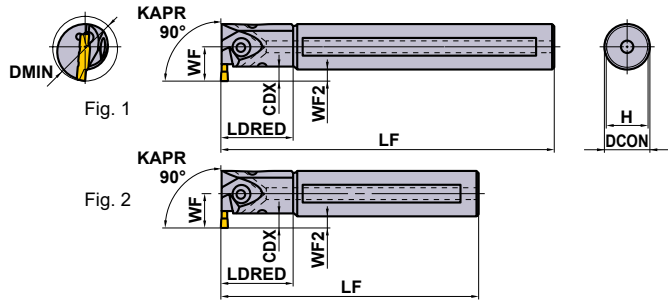
IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F110  
 CAUTION FOR USE > F112

# GY SERIES (INTERNAL GROOVING)



Note 1) For modular blades and modular holders, please order separately.  
 Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

● Monoblock type (Air / coolant through)



Right hand tool holder shown.

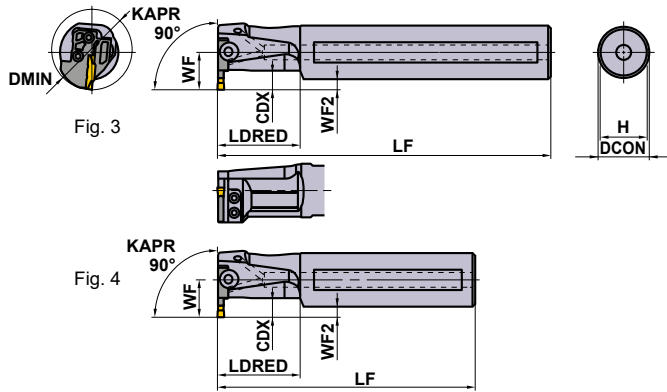
Seat Size	Dimensions (mm)			Type	Hand (R/L)	Order Number				Fig.
	CW	CDX *3	DMIN			Holder	Stock	Modular Blade	Stock	
H	4.75 5.00 5.24	7	32	Monoblock	R	<b>GYAR25K90B-H07</b>	●	—	—	2
				Monoblock	L	<b>GYAL25K90B-H07</b>	●	—	—	2
		4.5—11.5 *1	40	Modular	R	<b>GYDR32L90C-M20L</b>	●	<b>GYM20LA-H12</b>	●	4
				Modular	L	<b>GYDL32L90C-M20R</b>	●	<b>GYM20RA-H12</b>	●	4
		6—11.5 *1	50	Modular	R	<b>GYDR32S90C-M20L</b>	●	<b>GYM20LA-H12</b>	●	3
				Modular	L	<b>GYDL32S90C-M20R</b>	●	<b>GYM20RA-H12</b>	●	3
	7.5—13 *1	60	Modular	R	<b>GYDR40M90D-M20L</b>	●	<b>GYM20LA-H12</b>	●	4	
			Modular	L	<b>GYDL40M90D-M20R</b>	●	<b>GYM20RA-H12</b>	●	4	
		70	Modular	R	<b>GYDR40T90D-M20L</b>	●	<b>GYM20LA-H12</b>	●	3	
			Modular	L	<b>GYDL40T90D-M20R</b>	●	<b>GYM20RA-H12</b>	●	3	
		7.5—13 *1	60	Modular	R	<b>GYDR40M90D-M25L</b>	●	<b>GYM25LA-H14</b>	●	4
				Modular	L	<b>GYDL40M90D-M25R</b>	●	<b>GYM25RA-H14</b>	●	4
J	6.00 6.31 6.35	7.5—13 *1	60	Modular	R	<b>GYDR40M90D-M25L</b>	●	<b>GYM25LA-J14</b>	●	4
				Modular	L	<b>GYDL40M90D-M25R</b>	●	<b>GYM25RA-J14</b>	●	4
		70	Modular	R	<b>GYDR40T90D-M25L</b>	●	<b>GYM25LA-J14</b>	●	3	
			Modular	L	<b>GYDL40T90D-M25R</b>	●	<b>GYM25RA-J14</b>	●	3	
		7.5—13 *1	70	Modular	R	<b>GYDR50P90F-M25L</b>	●	<b>GYM25LA-J14</b>	●	4
				Modular	L	<b>GYDL50P90F-M25R</b>	●	<b>GYM25RA-J14</b>	●	4
	7.5—13 *1	70	Modular	R	<b>GYDR50T90F-M25L</b>	●	<b>GYM25LA-J14</b>	●	3	
			Modular	L	<b>GYDL50T90F-M25R</b>	●	<b>GYM25RA-J14</b>	●	3	

\*1 The maximum groove depth (CDX) varies according to the cutting diameter (DMIN). For details, please refer to page F111.  
 \*2 Dimensions shown are when the standard insert is used. If other insert geometries are used then LF, LDRED, WF and WF2 values may vary.  
 \*3 The maximum groove depth (CDX) is a value within the dimension LDRED.

● : Inventory maintained.

●Modular blade type (Air / coolant through)

\* Wrench : ① : Clamp Screw, ② : Blade Screw

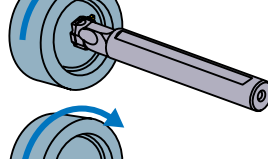
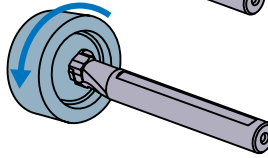
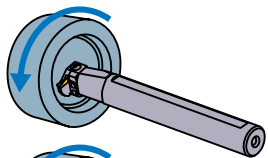


**SPARE PARTS**

Holder	① Clamp Screw	② Blade Screw 4 pcs.	① Wrench *
<b>GYAR/L25○90B-○07</b>	①GY05016S (Clamp Torque : 5.0N·m)	—	①TKY20R
<b>GYDR/L32○90C-M20L/R</b>	②GY06013M (Clamp Torque : 6.0N·m)	TS407 (Clamp Torque : 3.5N·m)	①TKY30R ②TKY15D
<b>GYDR/L40○90D-M20L/R</b>	②GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D
<b>GYDR/L50○90F-M25L/R</b>	②GY06013M (Clamp Torque : 6.0N·m)	TS55 (Clamp Torque : 5.0N·m)	①TKY30R ②TKY25D

Right hand tool holder shown.

	Dimensions (mm) *2						Cutting Mode
	DCON	LF	LDRED	WF	WF2	H	
	25	125	40	19	6.5	23	R
	25	125	40	19	6.5	23	
	25	200	40	19	6.5	23	
	25	200	40	19	6.5	23	
	32	140	50	22	6	30	R
	32	140	50	22	6	30	
	32	250	50	22	6	30	
	32	250	50	22	6	30	
	40	150	60	28	8	37	
	40	150	60	28	8	37	
	40	300	60	28	8	37	
	40	300	60	28	8	37	
	40	150	60	28	8	37	
	40	150	60	28	8	37	
	40	300	60	28	8	37	
	40	300	60	28	8	37	
	50	170	80	34	9	47	L
	50	170	80	34	9	47	
	50	300	80	34	9	47	
	50	300	80	34	9	47	
	40	150	60	28	8	37	
	40	150	60	28	8	37	
	40	300	60	28	8	37	
	40	300	60	28	8	37	
	50	170	80	34	9	47	
	50	170	80	34	9	47	
	50	300	80	34	9	47	
	50	300	80	34	9	47	



**Insert selection**

Seat Size	Geometry name
H	GY○○○0475/0500/0524H○○○○○-Breaker shown below

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker CW	GU	GS	GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Hardened steel)
H	4.75mm	●	●	●	●
	5.00mm	●	●	●	●

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker CW	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying) Ball nose
H	4.75mm				●
	RE 0.2	●			
	RE 0.4	●			
	RE 0.8	●			
	5.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
5.24mm	●				

Seat Size	Geometry name
J	GY○○○0600/0631/0635J○○○○○-Breaker shown below

For grooving/cutting off breaker > F012, F013					
Seat Size	Breaker CW	GU	GS	GM	GFGS
		(For gummy steel)	(Low)	(Medium)	(Hardened steel)
J	6.00mm	●	●	●	
	6.35mm	●	●	●	

For multifunctional grooving breaker > F014, F015					
Seat Size	Breaker CW	MF	MS	MM	BM
		(Finish)	(Low)	(Medium)	(Copying) Ball nose
J	6.00mm				●
	RE 0.2	●			
	RE 0.4	●	●	●	
	RE 0.8	●	●	●	
	6.31mm	●			
	6.35mm				●
	RE 0.2	●			
	RE 0.4	●			
RE 0.8	●				

● : Standard insert with dimensions

IDENTIFICATION > F008, F009  
 CUTTING CONDITIONS > F110  
 CAUTION FOR USE > F112

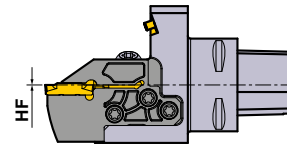
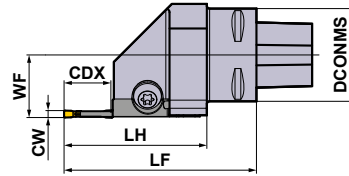
# GY SERIES (EXTERNAL / FACE GROOVING)

**PSC** 00° type holder

**NEW**

Note 1) Please order the modular blade and modular holder separately.

Note 2) Please set the right hand modular blade at the right hand holder and the left hand modular blade at the left hand holder.



Right hand tool holder shown.

(mm)

Order Number	Stock	Hand (R/L)	Coolant	Mounting Size	DCONMS	CW
C4-GYHERM00-M25R	★	R	External	PSC40	40	2.0-6.35
C4-GYHELM00-M25L	★	L	External	PSC40	40	2.0-6.35
C5-GYHERM00-M25R	★	R	External	PSC50	50	2.0-6.35
C5-GYHELM00-M25L	★	L	External	PSC50	50	2.0-6.35
C6-GYHERM00-M25R	★	R	External	PSC60	60	2.0-6.35
C6-GYHELM00-M25L	★	L	External	PSC60	60	2.0-6.35

GROOVING / CUTTING OFF

## Set Dimensions with Modular Blades

Holder Type	Modular Blade Type	Standard CW	CDX	WF	HF	LF	LH
C4-GYHER/LM00-M25R/L	GYM25R/L○-D06	2.0	6	27.0	0	69	47.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-D12	2.0	12	27.0	0	77	55.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-D20	2.0	20	27.0	0	83	61.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-E06	2.5	6	27.0	0	69	47.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-E12	2.5	12	27.0	0	77	55.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-E20	2.5	20	27.0	0	83	61.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-F06	3.0	6	27.0	0	69	47.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-F12	3.0	12	27.0	0	77	55.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-F20	3.0	20	27.0	0	83	61.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-G08	4.0	8	27.0	0	71	49.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-G14	4.0	14	27.0	0	77	55.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-G25	4.0	25	27.0	0	88	66.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-H08	5.0	8	27.0	0	71	49.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-H14	5.0	14	27.0	0	77	55.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-H25	5.0	25	27.0	0	88	66.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-J08	6.0	8	27.0	0	71	49.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-J14	6.0	14	27.0	0	77	55.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-J25	6.0	25	27.0	0	88	66.6

\*Modular blade type: Blades for face machining indicate a code for the minimum face grooving diameter. Example: GYM25RD-D12-040

The "○" symbol is a position to insert the letter "A" for external diameter machining or "D" for face machining.

Note 1) The indicated dimensions are values for standard inserts (GM breakers). If other inserts are mounted, LF and LH may differ.

★ : Inventory maintained in Japan.

(mm)







Holder Type	Modular Blade Type	Standard CW	CDX	WF	HF	LF	LH
C5-GYHER/LM00-M25R/L	GYM25R/L-D06	2.0	6	35.0	0	69	47.6
C5-GYHER/LM00-M25R/L	GYM25R/L-D12	2.0	12	35.0	0	77	55.6
C5-GYHER/LM00-M25R/L	GYM25R/L-D20	2.0	20	35.0	0	83	61.6
C5-GYHER/LM00-M25R/L	GYM25R/L-E06	2.5	6	35.0	0	69	47.6
C5-GYHER/LM00-M25R/L	GYM25R/L-E12	2.5	12	35.0	0	77	55.6
C5-GYHER/LM00-M25R/L	GYM25R/L-E20	2.5	20	35.0	0	83	61.6
C5-GYHER/LM00-M25R/L	GYM25R/L-F06	3.0	6	35.0	0	69	47.6
C5-GYHER/LM00-M25R/L	GYM25R/L-F12	3.0	12	35.0	0	77	55.6
C5-GYHER/LM00-M25R/L	GYM25R/L-F20	3.0	20	35.0	0	83	61.6
C5-GYHER/LM00-M25R/L	GYM25R/L-G08	4.0	8	35.0	0	71	49.6
C5-GYHER/LM00-M25R/L	GYM25R/L-G14	4.0	14	35.0	0	77	55.6
C5-GYHER/LM00-M25R/L	GYM25R/L-G25	4.0	25	35.0	0	88	66.6
C5-GYHER/LM00-M25R/L	GYM25R/L-H08	5.0	8	35.0	0	71	49.6
C5-GYHER/LM00-M25R/L	GYM25R/L-H14	5.0	14	35.0	0	77	55.6
C5-GYHER/LM00-M25R/L	GYM25R/L-H25	5.0	25	35.0	0	88	66.6
C5-GYHER/LM00-M25R/L	GYM25R/L-J08	6.0	8	35.0	0	71	49.6
C5-GYHER/LM00-M25R/L	GYM25R/L-J14	6.0	14	35.0	0	77	55.6
C5-GYHER/LM00-M25R/L	GYM25R/L-J25	6.0	25	35.0	0	88	66.6
C6-GYHER/LM00-M25R/L	GYM25R/L-D06	2.0	6	45.0	0	71	47.6
C6-GYHER/LM00-M25R/L	GYM25R/L-D12	2.0	12	45.0	0	79	55.6
C6-GYHER/LM00-M25R/L	GYM25R/L-D20	2.0	20	45.0	0	85	61.6
C6-GYHER/LM00-M25R/L	GYM25R/L-E06	2.5	6	45.0	0	71	47.6
C6-GYHER/LM00-M25R/L	GYM25R/L-E12	2.5	12	45.0	0	79	55.6
C6-GYHER/LM00-M25R/L	GYM25R/L-E20	2.5	20	45.0	0	85	61.6
C6-GYHER/LM00-M25R/L	GYM25R/L-F06	3.0	6	45.0	0	71	47.6
C6-GYHER/LM00-M25R/L	GYM25R/L-F12	3.0	12	45.0	0	79	55.6
C6-GYHER/LM00-M25R/L	GYM25R/L-F20	3.0	20	45.0	0	85	61.6
C6-GYHER/LM00-M25R/L	GYM25R/L-G08	4.0	8	45.0	0	73	49.6
C6-GYHER/LM00-M25R/L	GYM25R/L-G14	4.0	14	45.0	0	79	55.6
C6-GYHER/LM00-M25R/L	GYM25R/L-G25	4.0	25	45.0	0	90	66.6
C6-GYHER/LM00-M25R/L	GYM25R/L-H08	5.0	8	45.0	0	73	49.6
C6-GYHER/LM00-M25R/L	GYM25R/L-H14	5.0	14	45.0	0	79	55.6
C6-GYHER/LM00-M25R/L	GYM25R/L-H25	5.0	25	45.0	0	90	66.6
C6-GYHER/LM00-M25R/L	GYM25R/L-J08	6.0	8	45.0	0	73	49.6
C6-GYHER/LM00-M25R/L	GYM25R/L-J14	6.0	14	45.0	0	79	55.6
C6-GYHER/LM00-M25R/L	GYM25R/L-J25	6.0	25	45.0	0	90	66.6

\*Modular blade type: Blades for face machining indicate a code for the minimum face grooving diameter. Example: GYM25RD-D12-040

The "○" symbol is a position to insert the letter "A" for external diameter machining or "D" for face machining.

Note 1) The indicated dimensions are values for standard inserts (GM breakers). If other inserts are mounted, LF and LH may differ.

## SPARE PARTS

											
Order Number	Pcs.	Order Number	Pcs.	Order Number	Pcs.	Order Number	Pcs.	Order Number	Order Number		
GY06013M	1	TS55	5	HSD05004S	1	NZ22042080S	1	TKY25D	TKY30R		

\* Clamp Torque (N · m) : GY06013M=6.0, TS55=5.0

Nozzle Exchange Key : NZKH050S

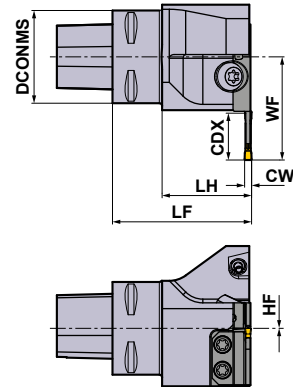
IDENTIFICATION	> F008, F010
INSERTS	> F012 – F015
CUTTING CONDITIONS	> F096, F104
CAUTION FOR USE	> F100, F106

# GY SERIES (EXTERNAL / FACE GROOVING)

**PSC** 90° type holder

**NEW**

Note 1) Please order the modular blade and modular holder separately.  
 Note 2) Please set the left hand modular blade at the right hand holder and the right hand modular blade at the left hand holder.



Left hand tool holder shown.

(mm)

Order Number	Stock	Hand (R/L)	Coolant	Mounting Size	DCONMS	CW
C4-GYHERM90-M25L	★	R	External	PSC40	40	2.0–6.35
C4-GYHELM90-M25R	★	L	External	PSC40	40	2.0–6.35
C5-GYHERM90-M25L	★	R	External	PSC50	50	2.0–6.35
C5-GYHELM90-M25R	★	L	External	PSC50	50	2.0–6.35
C6-GYHERM90-M25L	★	R	External	PSC60	60	2.0–6.35
C6-GYHELM90-M25R	★	L	External	PSC60	60	2.0–6.35

GROOVING / CUTTING OFF

## Set Dimensions with Modular Blades

Holder Type	Modular Blade Type	Standard CW	CDX	WF	HF	LF	LH
C4-GYHER/LM90-M25L/R	GYM25L/R-D06	2.0	6	30.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R-D12	2.0	12	38.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R-D20	2.0	20	44.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R-E06	2.5	6	30.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R-E12	2.5	12	38.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R-E20	2.5	20	44.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R-F06	3.0	6	30.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R-F12	3.0	12	38.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R-F20	3.0	20	44.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R-G08	4.0	8	32.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R-G14	4.0	14	38.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R-G25	4.0	25	49.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R-H08	5.0	8	32.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R-H14	5.0	14	38.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R-H25	5.0	25	49.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R-J08	6.0	8	32.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R-J14	6.0	14	38.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R-J25	6.0	25	49.5	0	60	38.6

\*Modular blade type: Blades for face machining indicate a code for the minimum face grooving diameter. Example: GYM25RD-D12-040  
 The "○" symbol is a position to insert the letter "A" for external diameter machining or "D" for face machining.  
 Note 1) The indicated dimensions are values for standard inserts (GM breakers). If other inserts are mounted, LF and LH may differ.

★ : Inventory maintained in Japan.









(mm)

Holder Type	Modular Blade Type	Standard CW	CDX	WF	HF	LF	LH
C5-GYHER/LM90-M25L/R	GYM25L/R○-D06	2.0	6	33.0	0	60	38.6
C5-GYHER/LM90-M25L/R	GYM25L/R○-D12	2.0	12	41.0	0	60	38.6
C5-GYHER/LM90-M25L/R	GYM25L/R○-D20	2.0	20	47.0	0	60	38.6
C5-GYHER/LM90-M25L/R	GYM25L/R○-E06	2.5	6	33.0	0	60	38.6
C5-GYHER/LM90-M25L/R	GYM25L/R○-E12	2.5	12	41.0	0	60	38.6
C5-GYHER/LM90-M25L/R	GYM25L/R○-E20	2.5	20	47.0	0	60	38.6
C5-GYHER/LM90-M25L/R	GYM25L/R○-F06	3.0	6	33.0	0	60	38.6
C5-GYHER/LM90-M25L/R	GYM25L/R○-F12	3.0	12	41.0	0	60	38.6
C5-GYHER/LM90-M25L/R	GYM25L/R○-F20	3.0	20	47.0	0	60	38.6
C5-GYHER/LM90-M25L/R	GYM25L/R○-G08	4.0	8	35.0	0	60	38.6
C5-GYHER/LM90-M25L/R	GYM25L/R○-G14	4.0	14	41.0	0	60	38.6
C5-GYHER/LM90-M25L/R	GYM25L/R○-G25	4.0	25	52.0	0	60	38.6
C5-GYHER/LM90-M25L/R	GYM25L/R○-H08	5.0	8	35.0	0	60	38.6
C5-GYHER/LM90-M25L/R	GYM25L/R○-H14	5.0	14	41.0	0	60	38.6
C5-GYHER/LM90-M25L/R	GYM25L/R○-H25	5.0	25	52.0	0	60	38.6
C5-GYHER/LM90-M25L/R	GYM25L/R○-J08	6.0	8	35.0	0	60	38.6
C5-GYHER/LM90-M25L/R	GYM25L/R○-J14	6.0	14	41.0	0	60	38.6
C5-GYHER/LM90-M25L/R	GYM25L/R○-J25	6.0	25	52.0	0	60	38.6
C6-GYHER/LM90-M25L/R	GYM25L/R○-D06	2.0	6	40.0	0	70	46.6
C6-GYHER/LM90-M25L/R	GYM25L/R○-D12	2.0	12	48.0	0	70	46.6
C6-GYHER/LM90-M25L/R	GYM25L/R○-D20	2.0	20	54.0	0	70	46.6
C6-GYHER/LM90-M25L/R	GYM25L/R○-E06	2.5	6	40.0	0	70	46.6
C6-GYHER/LM90-M25L/R	GYM25L/R○-E12	2.5	12	48.0	0	70	46.6
C6-GYHER/LM90-M25L/R	GYM25L/R○-E20	2.5	20	54.0	0	70	46.6
C6-GYHER/LM90-M25L/R	GYM25L/R○-F06	3.0	6	40.0	0	70	46.6
C6-GYHER/LM90-M25L/R	GYM25L/R○-F12	3.0	12	48.0	0	70	46.6
C6-GYHER/LM90-M25L/R	GYM25L/R○-F20	3.0	20	54.0	0	70	46.6
C6-GYHER/LM90-M25L/R	GYM25L/R○-G08	4.0	8	42.0	0	70	46.6
C6-GYHER/LM90-M25L/R	GYM25L/R○-G14	4.0	14	48.0	0	70	46.6
C6-GYHER/LM90-M25L/R	GYM25L/R○-G25	4.0	25	59.0	0	70	46.6
C6-GYHER/LM90-M25L/R	GYM25L/R○-H08	5.0	8	42.0	0	70	46.6
C6-GYHER/LM90-M25L/R	GYM25L/R○-H14	5.0	14	48.0	0	70	46.6
C6-GYHER/LM90-M25L/R	GYM25L/R○-H25	5.0	25	59.0	0	70	46.6
C6-GYHER/LM90-M25L/R	GYM25L/R○-J08	6.0	8	42.0	0	70	46.6
C6-GYHER/LM90-M25L/R	GYM25L/R○-J14	6.0	14	48.0	0	70	46.6
C6-GYHER/LM90-M25L/R	GYM25L/R○-J25	6.0	25	59.0	0	70	46.6

\*Modular blade type: Blades for face machining indicate a code for the minimum face grooving diameter. Example: GYM25RD-D12-040  
The "○" symbol is a position to insert the letter "A" for external diameter machining or "D" for face machining.

Note 1) The indicated dimensions are values for standard inserts (GM breakers). If other inserts are mounted, LF and LH may differ.

## SPARE PARTS

											
Order Number	Pcs.	Order Number	Pcs.	Order Number	Pcs.	Order Number	Pcs.	Order Number	Order Number		
GY06013M	1	TS55	5	HSD05004S	1	NZ22042080S	1	TKY25D	TKY30R		

\* Clamp Torque (N · m) : GY06013M=6.0, TS55=5.0

Nozzle Exchange Key : NZKH050S

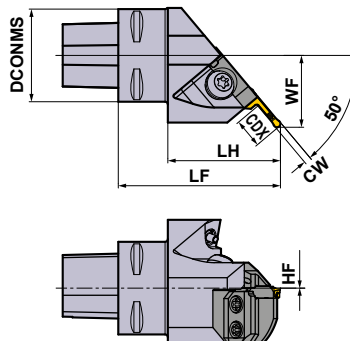
IDENTIFICATION	> F008, F010
INSERTS	> F012 – F015
CUTTING CONDITIONS	> F096, F104
CAUTION FOR USE	> F100, F106

## GY SERIES (FOR RECESSING)

**PSC** For 50° recessing holder **NEW**

Note 1) Please order the modular blade and modular holder separately.

Note 2) Please set the left hand modular blade at the right hand holder and the right hand modular blade at the left hand holder.



Left hand tool holder shown.

(mm)

Order Number	Stock	Hand (R/L)	Coolant	Mounting Size	DCONMS	CW
C4-GYHERM50-M25L	★	R	External	PSC40	40	2.0-6.35
C4-GYHELM50-M25R	★	L	External	PSC40	40	2.0-6.35
C5-GYHERM50-M25L	★	R	External	PSC50	50	2.0-6.35
C5-GYHELM50-M25R	★	L	External	PSC50	50	2.0-6.35
C6-GYHERM50-M25L	★	R	External	PSC60	60	2.0-6.35
C6-GYHELM50-M25R	★	L	External	PSC60	60	2.0-6.35

GROOVING / CUTTING OFF

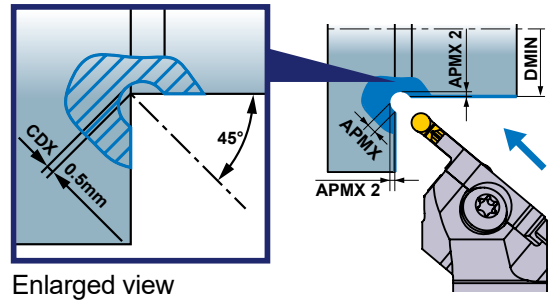
### SPARE PARTS

Order Number	Pcs.	Order Number	Pcs.	Order Number	Pcs.	Order Number	Pcs.	Order Number	Order Number		
GY06013M	1	TS55	4	HSD05004S	1	NZ22042080S	1	TKY25D	TKY30R		

\* Clamp Torque (N · m) : GY06013M=6.0, TS55=5.0

Nozzle Exchange Key : NZKH050S

★ : Inventory maintained in Japan.



Enlarged view

### Set Dimensions with Modular Blades

(mm)

Holder Type	Modular Blade Type	Standard CW	CDX	DMIN	APMX	APMX2	WF	HF	LF	LH
C4-GYHER/LM50-M25L/R	GYM25L/RC-D005	2.0	0.5	30	1.50	0.646	30.6	0	70.2	48.8
C4-GYHER/LM50-M25L/R	GYM25L/RC-E005	2.5	0.5	30	1.75	0.720	30.8	0	70.1	48.7
C4-GYHER/LM50-M25L/R	GYM25L/RC-F005	3.0	0.5	30	2.00	0.793	31.0	0	70.0	48.6
C4-GYHER/LM50-M25L/R	GYM25L/RC-G005	4.0	0.5	20	2.50	0.939	31.4	0	69.8	48.4
C4-GYHER/LM50-M25L/R	GYM25L/RC-H005	5.0	0.5	20	2.88	1.049	31.8	0	69.6	48.2
C4-GYHER/LM50-M25L/R	GYM25L/RC-J005	6.0	0.5	20	3.50	1.232	32.4	0	69.4	48.0
C5-GYHER/LM50-M25L/R	GYM25L/RC-D005	2.0	0.5	30	1.50	0.646	32.6	0	70.2	48.8
C5-GYHER/LM50-M25L/R	GYM25L/RC-E005	2.5	0.5	30	1.75	0.720	32.8	0	70.1	48.7
C5-GYHER/LM50-M25L/R	GYM25L/RC-F005	3.0	0.5	30	2.00	0.793	33.0	0	70.0	48.6
C5-GYHER/LM50-M25L/R	GYM25L/RC-G005	4.0	0.5	20	2.50	0.939	33.4	0	69.8	48.4
C5-GYHER/LM50-M25L/R	GYM25L/RC-H005	5.0	0.5	20	2.88	1.049	33.8	0	69.6	48.2
C5-GYHER/LM50-M25L/R	GYM25L/RC-J005	6.0	0.5	20	3.50	1.232	34.4	0	69.4	48.0
C6-GYHER/LM50-M25L/R	GYM25L/RC-D005	2.0	0.5	30	1.50	0.646	39.6	0	70.2	46.8
C6-GYHER/LM50-M25L/R	GYM25L/RC-E005	2.5	0.5	30	1.75	0.720	39.8	0	70.1	46.7
C6-GYHER/LM50-M25L/R	GYM25L/RC-F005	3.0	0.5	30	2.00	0.793	40.0	0	70.0	46.6
C6-GYHER/LM50-M25L/R	GYM25L/RC-G005	4.0	0.5	20	2.50	0.939	40.4	0	69.8	46.4
C6-GYHER/LM50-M25L/R	GYM25L/RC-H005	5.0	0.5	20	2.88	1.049	40.8	0	69.6	46.2
C6-GYHER/LM50-M25L/R	GYM25L/RC-J005	6.0	0.5	20	3.50	1.232	41.4	0	69.4	46.0

DMIN = Min. Cut Diameter

\*Modular blade type: Blades for face machining indicate a code for the minimum face grooving diameter. Example: GYM25RD-D12-040  
The "○" symbol is a position to insert the letter "A" for external diameter machining or "D" for face machining.

Note 1) The indicated dimensions are values for standard inserts (BM breakers). If other inserts are mounted, LF and LH may differ.

F

GROOVING / CUTTING OFF

IDENTIFICATION	> F008, F010
INSERTS	> F015
CUTTING CONDITIONS	> F099
CAUTION FOR USE	> F099

F095

# GROOVING / CUTTING OFF

## RECOMMENDED CUTTING SPEED [For External Grooving / Cutting Off]

Work Material	Hardness	Grade	Cutting Speed (m/min)								
			50	100	150	200	250	300	500		
P Mild Steel	≤160HB	VP20RT		100		220					
		VP10RT		110		230					
		NX2525		90		210					
	Carbon Steel Alloy Steel	160-280HB	VP20RT		80		180				
			VP10RT		90		190				
			MY5015		110		250				
			NX2525		70		170				
		280HB≤	VP20RT		60		140				
			VP10RT		70		150				
			MY5015		90		210				
NX2525		55		135							
M Stainless Steel	≤270HB	VP20RT		60		140					
		VP10RT		70		150					
K Gray Cast Iron	Tensile Strength ≤300MPa	VP20RT		80		180					
		VP10RT		90		180					
		MY5015		140		300					
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT		60		140				
			VP10RT		70		150				
			MY5015		90		210				
S Heat Resistant Alloy Titanium Alloy	-	MP9015		40		100					
		MP9025		30		90					
		VP20RT		30		60					
		VP10RT/ RT9010		40		70					
H Hardened steel	50HRC≤	BC8110		80		120					
N Aluminium Alloy	Content Si<5%	RT9010					200			500	
	Content 5%≤Si≤10%	RT9010					200			500	
	Content Si>10%	RT9010		100		200					

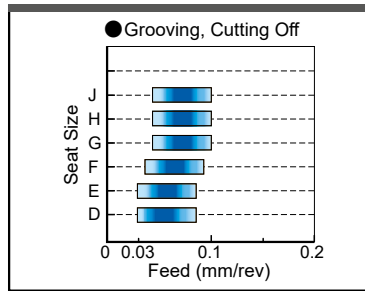
Note 1) For RT9010, VP10RT, VP20RT and MY5015, wet cutting is recommended.

# RECOMMENDED CUTTING CONDITIONS [For External Grooving / Cutting Off]

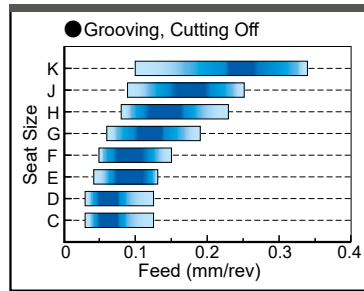
\*Below are the recommended cutting conditions when using the modular holder GYHR/L2525M00/90-M25R/L with the modular blade GYM25R/LA-○○○.

## Recommended feed rate and depth of cut

### GU BREAKER



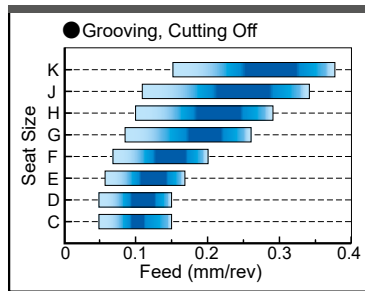
### GS BREAKER



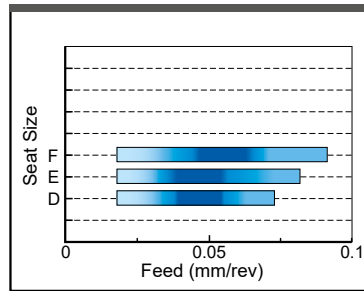
■ : 1st recommended area

Seat Size			
	Insert Width (mm)		Insert Width (mm)
C	1.50	G	4.00
			4.24
D	2.00	H	4.75
	2.24		5.00
E	2.39	J	6.00
	2.50		6.31
F	2.74	K	6.35
	3.00		
	3.18		
	3.24		

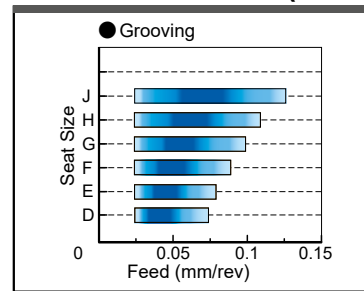
### GM BREAKER



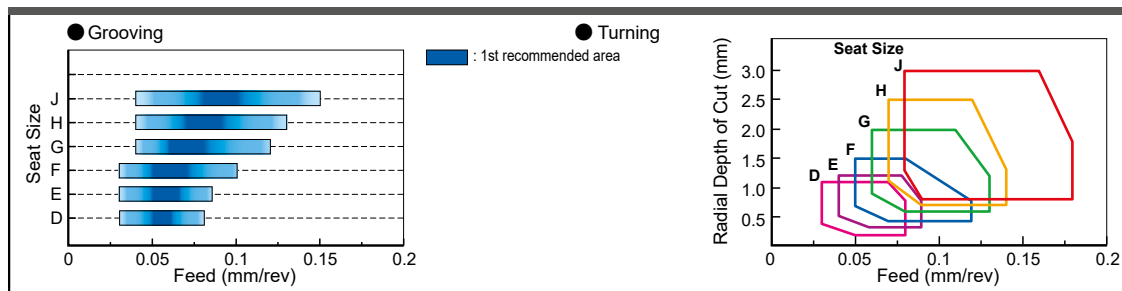
### GL BREAKER



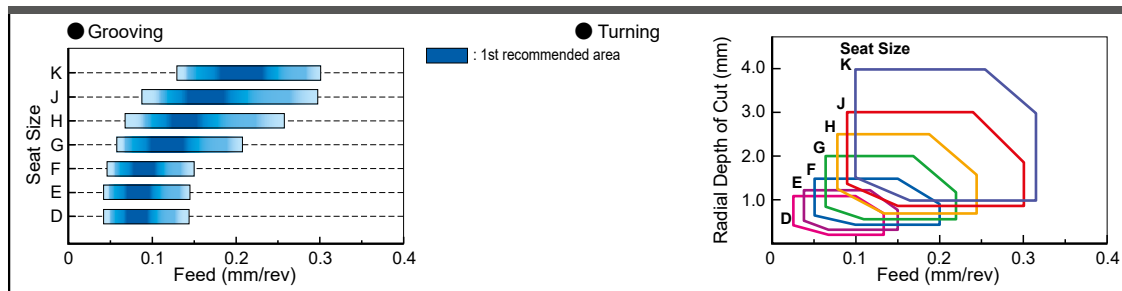
### FLAT TOP GFGS (CBN)



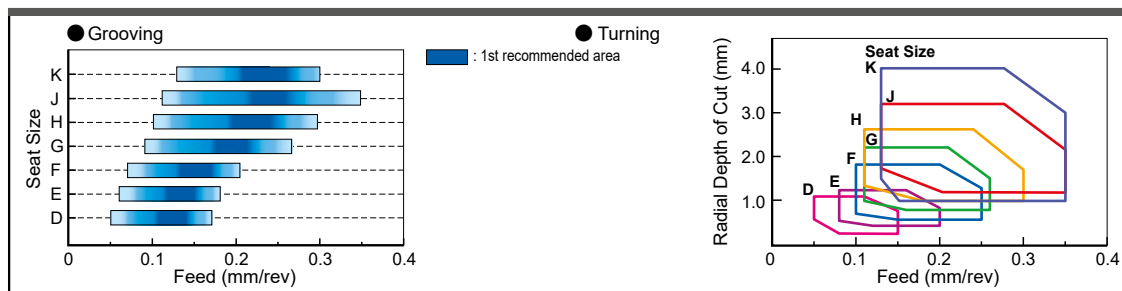
### MF BREAKER



### MS BREAKER



### MM BREAKER



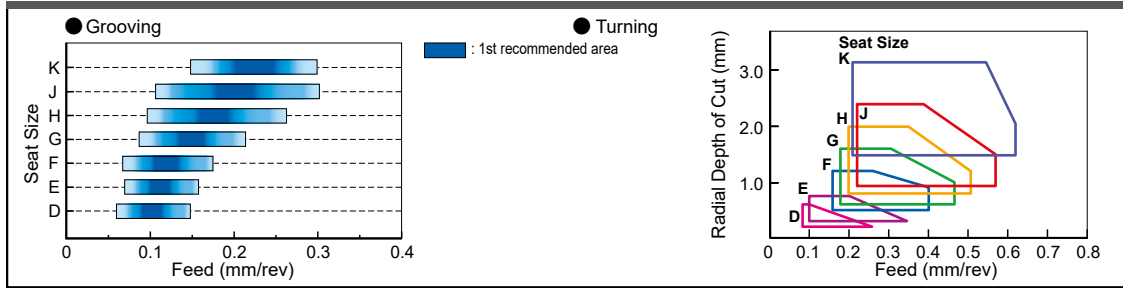
T

GROOVING / CUTTING OFF

# GROOVING / CUTTING OFF

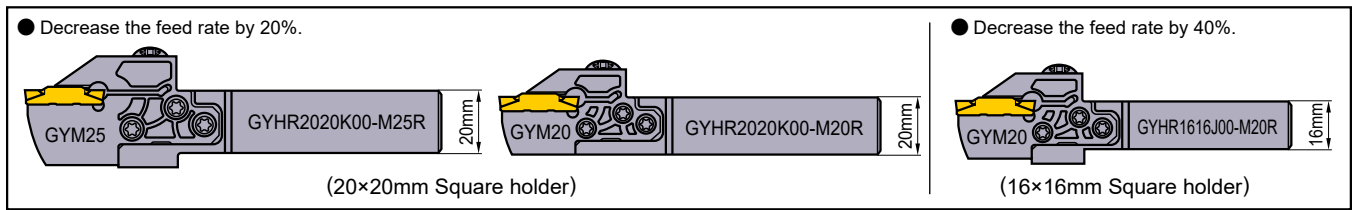
## Recommended feed rate and depth of cut

### BM BREAKER

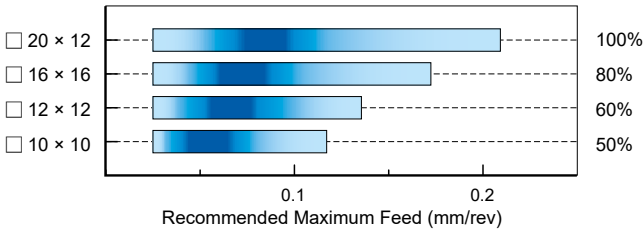


Seat Size	
Insert Width (mm)	
C	1.50
D	2.00 2.24
E	2.39 2.50 2.74
F	3.00 3.18 3.24
G	4.00 4.24
H	4.75 5.00 5.24
J	6.00 6.31 6.35
K	8.00

Note 1) When using a combination as shown below, decrease the recommended feed rate by 20% and 40% respectively.



### In the case of monoblock type holder for Swiss style lathes

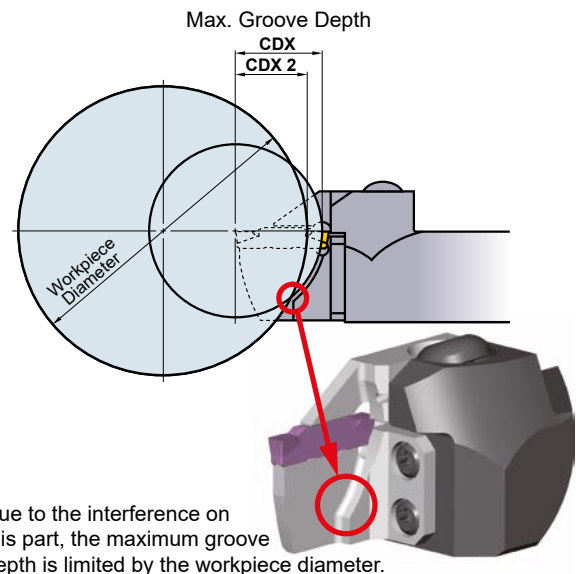
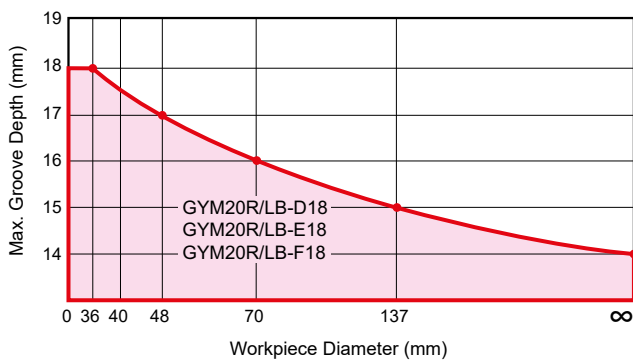


Please refer to the tables above on recommended cutting conditions for external grooving and cutting off. Apply the percentage ratio shown on each shank size with the values in the table.

## LIMITATION OF THE MAXIMUM GROOVE DEPTH [For External Grooving]

● When using the modular blade GYM $\odot$ R/LA- $\odot\odot\odot$   
The maximum groove depth is not limited by the workpiece diameter.

● When using the modular blade GYM $\odot$ R/LB- $\odot\odot\odot$   
The maximum groove depth is limited by the workpiece diameter.

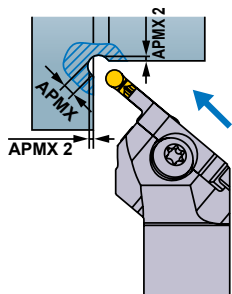


## RECOMMENDED CUTTING SPEED (m/min) [For External Recessing]

Work Material	Hardness	Grade	Cutting Speed (m/min)					
			50	100	150	200	250	
P Mild Steel Carbon Steel Alloy Steel Carbon Steel Alloy Steel	≤180HB	VP20RT		80	180			
		VP10RT		90	190			
	180–280HB	VP20RT	60	140				
		VP10RT	70	150				
		MY5015	90	210				
		NX2525	55	135				
	280–350HB	VP20RT	50	110				
		VP10RT	60	120				
		MY5015	80	160				
		NX2525	45	105				
	M Stainless Steel	≤350HB	VP20RT	50	110			
			VP10RT	60	120			
K Gray Cast Iron Ductile Cast Iron	Tensile Strength ≤350MPa	VP20RT	60	140				
		VP10RT	70	150				
		MY5015	90	210				
	Tensile Strength ≤800MPa	VP20RT	50	110				
		VP10RT	60	120				
		MY5015	80	160				
S Titanium Alloy Heat Resistant Alloy	—	MP9015	40	100				
		MP9025	30	90				
		VP20RT	30	60				
		VP10RT	40	70				

Note 1) For VP10RT, VP20RT and MY5015, wet cutting is recommended.

## DISTANCE FROM THE WORKPIECE TO THE RECESS DEPTH

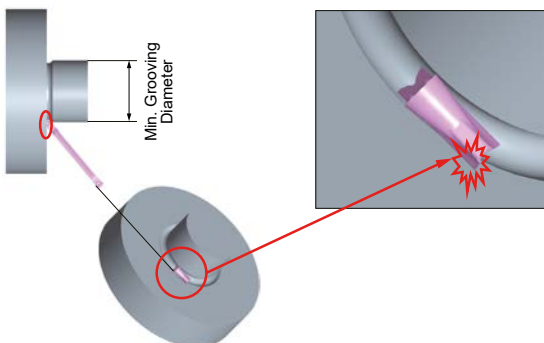


Cutting Width CW (mm)	Recessing Depth APMX (mm)	Distance workpiece to the recess depth APMX 2 (mm)
2.00	1.50	0.646
2.50	1.75	0.720
3.00	2.00	0.793
3.18	2.09	0.819
4.00	2.50	0.939
4.75	2.88	1.049
5.00	3.00	1.086
6.00	3.50	1.232
6.35	3.68	1.283

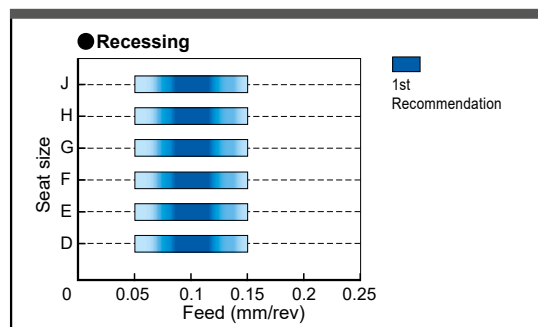
## BM BREAKER

### Minimum grooving diameter

Ensure the tool is suitable for the diameter being machined. Refer to the Min. Grooving Diameter DMIN as shown in the table on page F036 to avoid a collision with the workpiece as shown below.



### Recommended feed rate and depth of cut



## TOOL SELECTION

### Notes when selecting the tool body

#### Modular holder

GYM25 GYHR2525M00-M25R 25mm ✓

GYM25 GYHR2020K00-M25R 20mm ✗

Modular Holder

- To ensure sufficient clamping rigidity, select a modular holder with the largest possible shank size.

#### Modular blade (1)

GYM25 GYHR2020K00-M25R 20mm ✓

GYM20 GYHR2020K00-M20R 20mm ✗

Modular Blade

- If there is no restriction for use, select the largest modular blade for the same shank size.

#### Modular blade (2)

✓ ✗

- Select the shortest possible blade suitable for the application.

#### Modular blade (3)

✓ ✗

- Select the shortest possible blade suitable for the application.

### Notes when setting the tool

#### Setting of cutting edge height

<Grooving/Cross-feed machining>  
Set the cutting edge height to  $\pm 0.1\text{mm}$  parallel to the central axis.

<Cutting off>  
Set the cutting edge height to  $0\text{--}+0.2\text{mm}$  parallel to the central axis.

#### Tool body setting angle

90° 90°

- Set the insert perpendicular to the central axis.

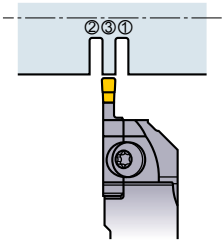
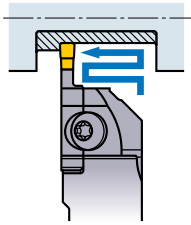
#### Overhang

- When setting the tool, ensure that the overhang is as short as possible and avoid contact of the tool post with the top clamp as shown in the figures above.

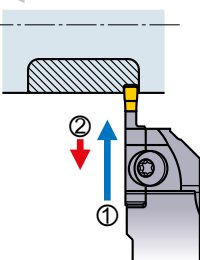
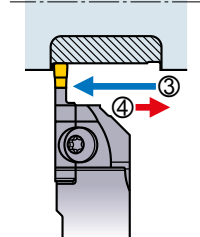
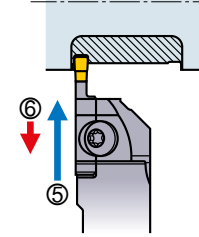
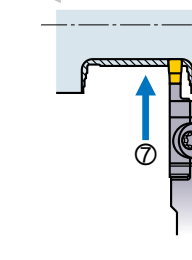
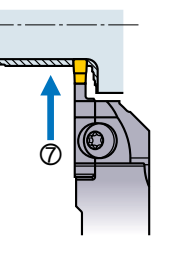

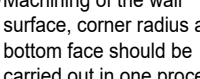
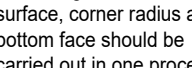
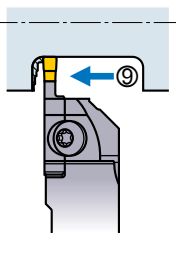
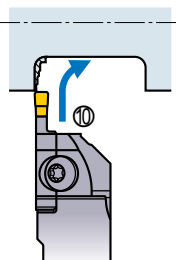
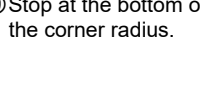
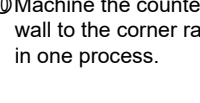
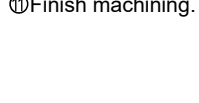


# MACHINING RECOMMENDATIONS

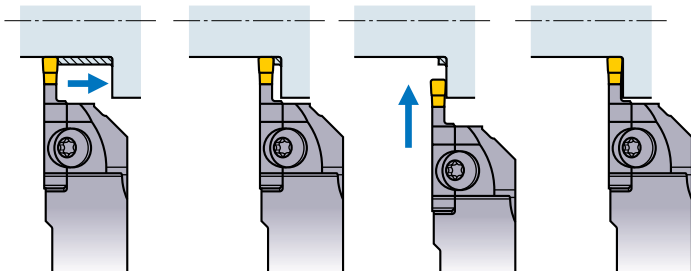
## Notes on multi-functional machining (MF, MS and MM breakers)

Machining narrow grooves	Machining wide grooves
 <p>● It is recommended to carry out plunging in several passes. Following the steps above makes it difficult for chips to elongate. This also improves the accuracy of workpiece wall surface.</p>	 <p>● It is recommended that cross-feed machining is used.</p>

### Machining wide grooves

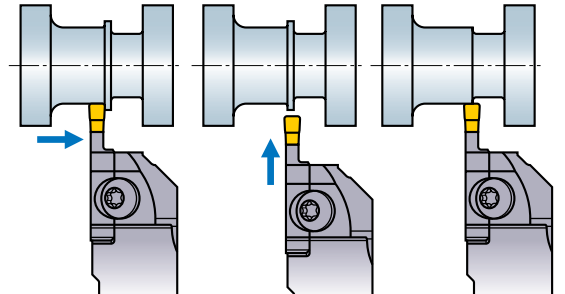
ROUGHING			FINISHING	
 <p>① Carry out grooving.</p>	 <p>② Retract the tool approx 0.1 mm.</p>	 <p>③ Carry out cross feed machining.</p>	 <p>④ Retract the tool approx 0.1 mm.</p>	 <p>⑤ Carry out grooving.</p>
<p>⑥ Retract the tool approx 0.1 mm. * Repeat the steps ①-⑥.</p>			 <p>⑥ Retract the tool approx 0.1 mm.</p>	 <p>⑦ Carry out grooving to the end point of the corner radius.</p>
<h3 style="text-align: center;">FINISHING</h3>			<h3 style="text-align: center;">Precautions when finishing walls</h3>	
 <p>⑦ Carry out grooving to the end point of the corner radius.</p>	 <p>⑧ Machining of the wall surface, corner radius and bottom face should be carried out in one process.</p>	 <p>● To produce high accuracy walls using MS or MM breaker insert, do not carry out back turning. Plunging is recommended.</p>		
 <p>⑨ Stop at the bottom of the corner radius.</p>	 <p>⑩ Machine the counter wall to the corner radius in one process.</p>	 <p>⑪ Finish machining.</p>		

### Wall machining



● When machining a wall, chip jamming can occur. In this case, stop cross feed machining just before the wall (at a point less than the insert width) then remove the remaining material by plunging.

### Machining of a ring section

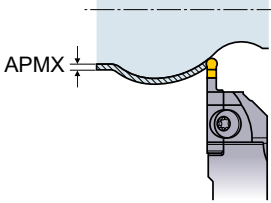
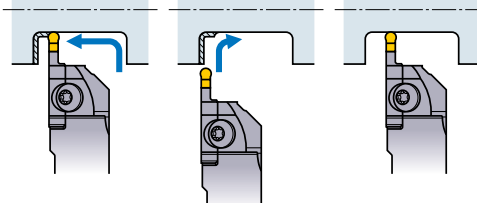


● When a ring remains in a cross feed end process, finish cross feed machining 1–1.5 mm short of the end point, then remove the ring by plunging.

GROOVING / CUTTING OFF

## MACHINING RECOMMENDATIONS

### Notes on multi-functional machining (BM breaker)

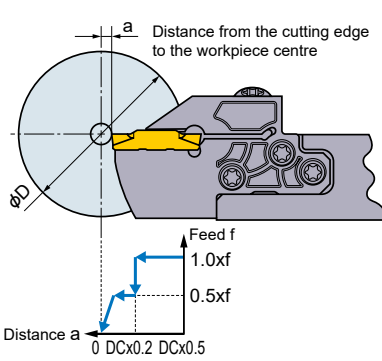
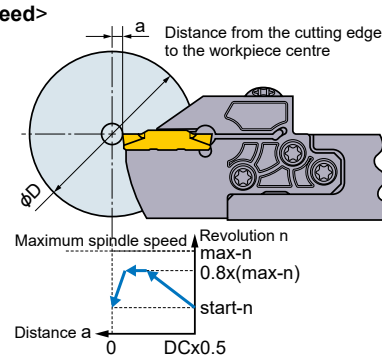
Copying	Roughing
 <p>● With the BM breaker insert, 3 dimensional copying is possible. Set the depth of cut (APMX) to 40% less than the insert width.</p>	 <p>● Use plunging and cross-feed machining. When machining the corner, vibration is likely to occur. To avoid this, reduce the feed by 50%.</p>

### Finishing

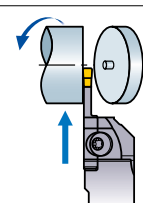
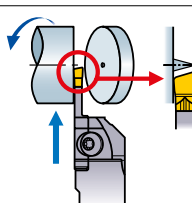
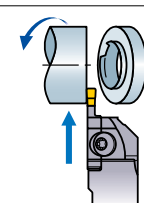
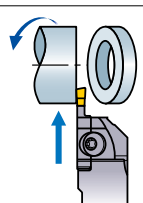
Insert	APMX 2 (mm)
GY2M0200D100N-BM	0.05
GY2M0250E125N-BM	0.10
GY2M0300F150N-BM	0.15
GY2M0318F159N-BM	
GY2M0400G200N-BM	0.20
GY2M0475H238N-BM	
GY2M0500H250N-BM	0.24
GY2M0600J300N-BM	
GY2M0635J318N-BM	0.30
GY2M0800K400N-BM	
	0.40

● Carry out finishing in one process. For the depth of cut (APMX 2) when back turning, refer to the table on the right.

### Notes for cutting off

Feed	Revolution
<p>&lt;Feed&gt;</p>  <p>● When the cutting edge approaches the centre, reduce the feed by 50%.</p> <p>● If necessary, stop the feed prior to reaching the centre of the workpiece to prevent it falling under its own weight.</p>	<p>&lt;Spindle speed&gt;</p>  <p>● When using constant cutting speed during a cutting off cycle, it is recommended to limit the spindle speed to 80% of maximum to ensure stability.</p> <p>● To prevent the workpiece from being expelled, lower the spindle speed before finishing the grooving operation.</p>

### Insert

Neutral insert	Handed insert
 <p>Neutral insert</p>	 <p>Handed insert</p>
 <p>Neutral insert</p>	 <p>Handed insert</p>

● When there is a centre stub on solid bar work or burrs are formed on pipe material, it is possible to decrease them by using a handed insert. With a handed insert, machining tends to be less stable when compared to using a neutral insert. Pay special attention to avoid fracturing of the cutting edge and decrease the feed when necessary.

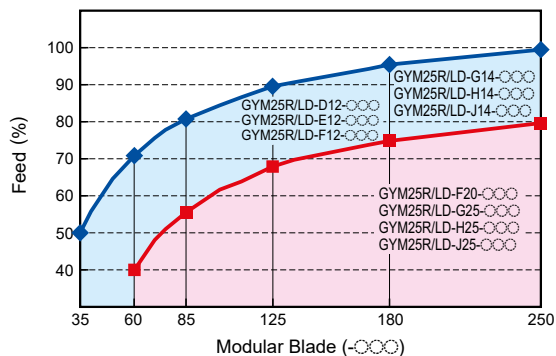
# Memo

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A series of horizontal dashed lines for writing, spanning the width of the page.

# GROOVING / CUTTING OFF

## RELATIONSHIP BETWEEN THE MODULAR BLADE AND FEED PER ROTATION [For Face Grooving]



Note 1) Adjust the feed per rotation in the cutting conditions to the percentage shown in the table above.

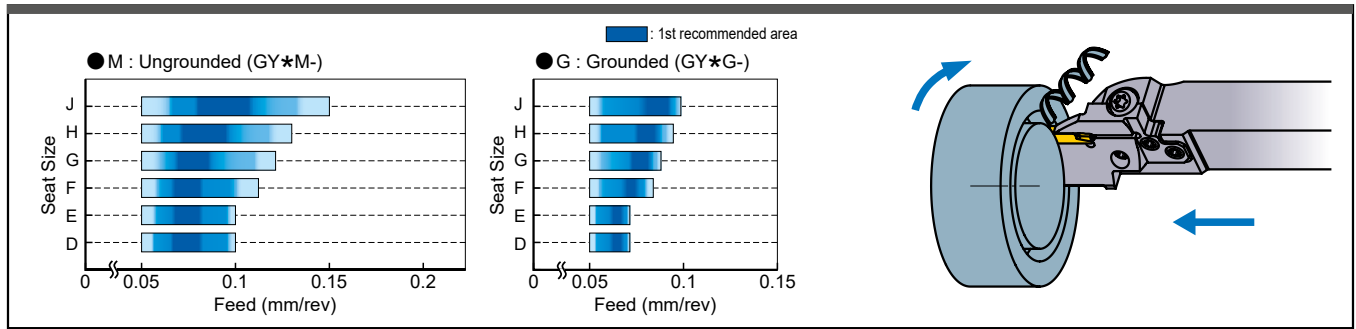
## RECOMMENDED CUTTING SPEED [For Face Grooving]

Work Material	Hardness	Grade	Cutting Speed (m/min)						
			50	100	150	200	250	300	
P Mild Steel	≤160HB	VP20RT	80 — 180						
		VP10RT	90 — 190						
		NX2525	70 — 170						
	Carbon Steel Alloy Steel	160–280HB	VP20RT	60 — 140					
			VP10RT	70 — 150					
			MY5015	90 — 210					
			NX2525	55 — 135					
		280HB≤	VP20RT	50 — 110					
			VP10RT	60 — 120					
			MY5015	80 — 160					
M Stainless Steel	≤270HB	VP20RT	50 — 110						
		VP10RT	60 — 120						
K Gray Cast Iron	Tensile Strength ≤300MPa	VP20RT	60 — 140						
		VP10RT	70 — 150						
		MY5015	90 — 210						
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT	50 — 110					
			VP10RT	60 — 120					
			MY5015	80 — 160					
S Heat Resistant Alloy Titanium Alloy	—	MP9015	40 — 100						
		MP9025	30 — 90						
		VP20RT	30 — 60						
		VP10RT	40 — 70						
		RT9010	40 — 70						
H Hardened Steel	50HRC≤	BC8110	60 — 120						

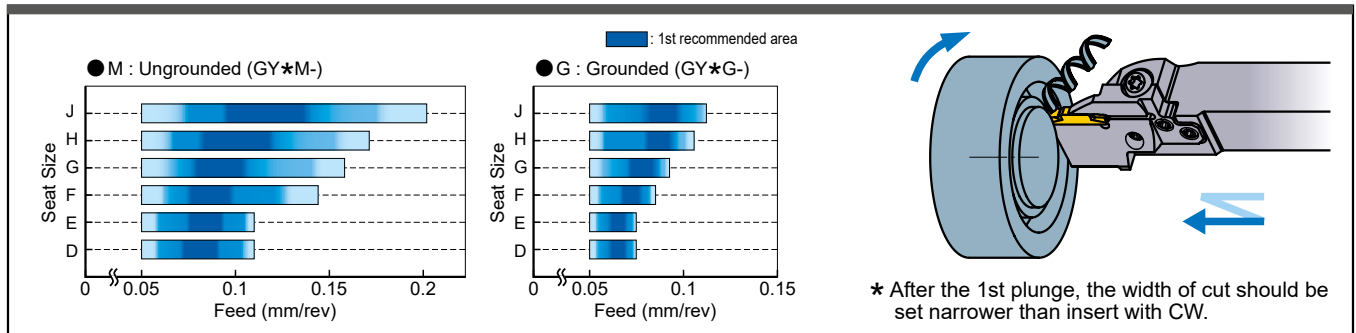
Note 1) For VP10RT, VP20RT and MY5015, wet cutting is recommended.

# RECOMMENDED CUTTING CONDITIONS [For Face Grooving]

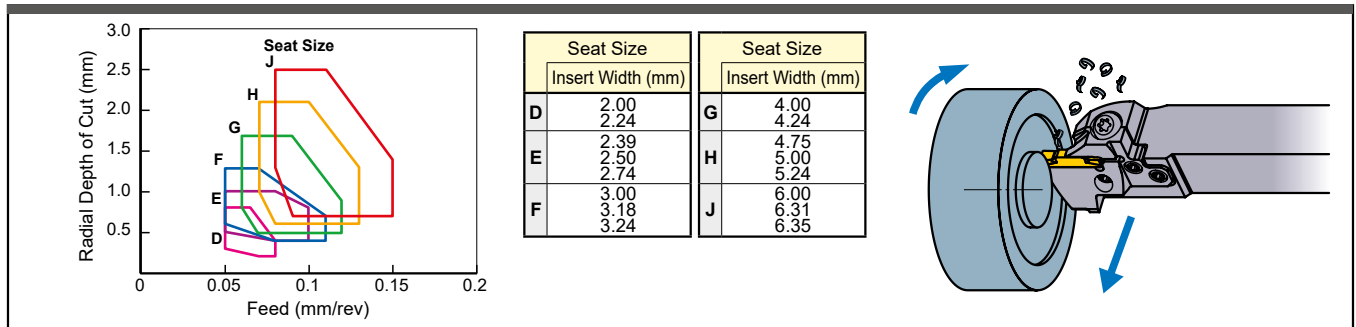
## GROOVING



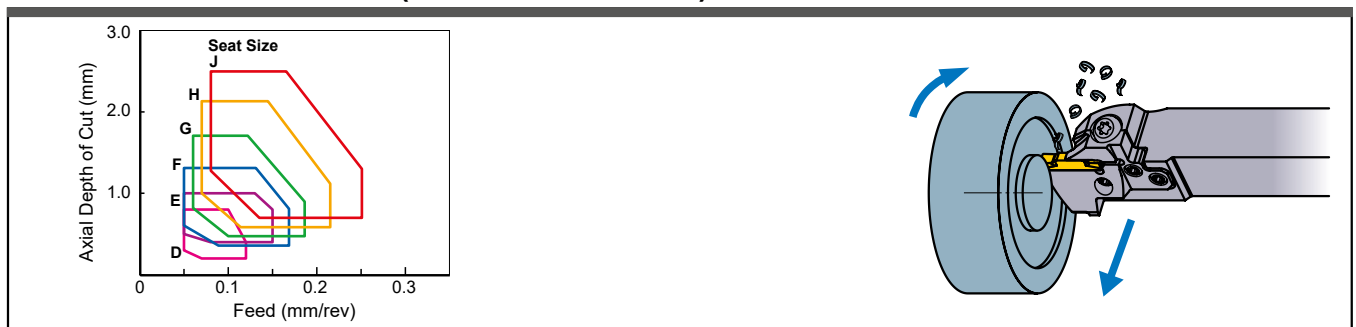
## PLUNGING



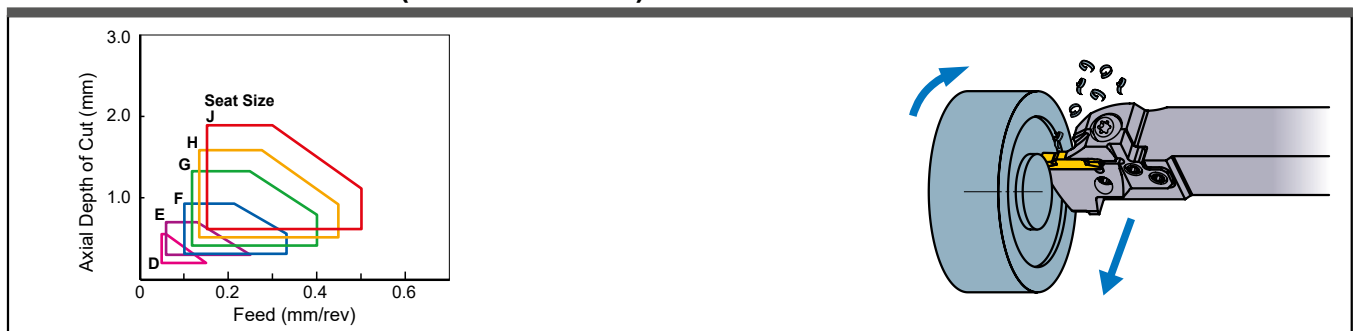
## TRAVERSE MACHINING (MF BREAKER)



## TRAVERSE MACHINING (MM/MS BREAKER)



## TRAVERSE MACHINING (BM BREAKER)



## TOOL SELECTION

### Notes when selecting the tool body

#### Modular blade (1)

- Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of DAXN minimum and DAXX maximum that are described in the table of dimensions.

DAXX (Max.)  
DAXN (Min.)

#### Modular blade (2)

- Select the shortest possible blade suitable for the application.

#### Modular blade (3)

The maximum cutting diameter

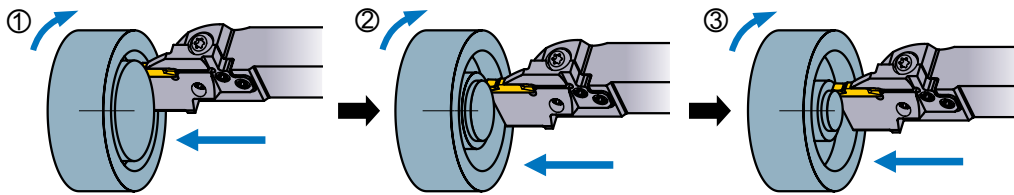
- Select the largest size blade within the maximum cutting diameter of the workpiece.
- Machine from the outer diameter towards the centre.

↓

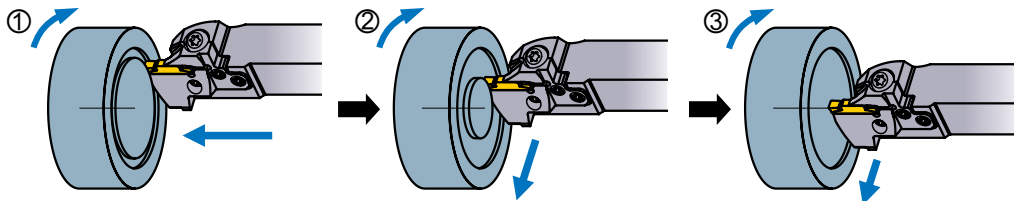
- Increased machining stability and rigidity is possible if a modular blade with the largest possible back metal is used.

At first machine the maximum cutting diameter, there is no restriction in the cutting diameter on the remaining process.

● When plunging in several passes.



● When combining plunging and infeed machining.



#### Modular holder

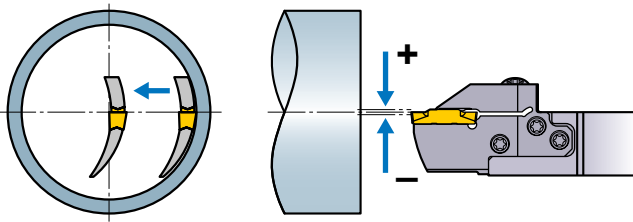
Modular holder

Modular holder

- Select a modular holder with the largest possible shank size to maintain mounting rigidity.

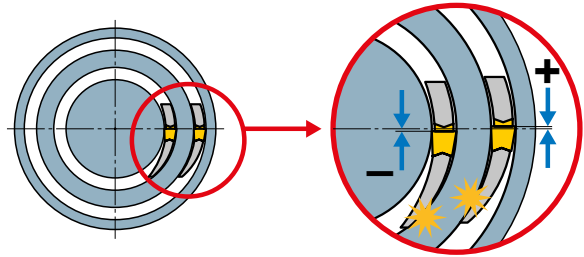
## Notes when setting the tool

### Setting the cutting edge height



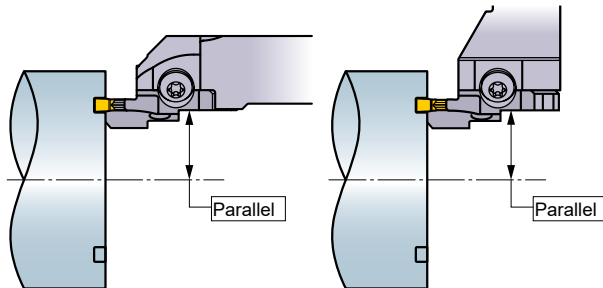
- Set the cutting edge height to  $\pm 0.1\text{mm}$  parallel to the central axis.
- Cutting edge centre height check should be done by traverse machining towards the centre with a very small depth of cut and ensure that an even surface and no material remains at the centre point afterwards.

### When interfering the wall of groove and the modular blade



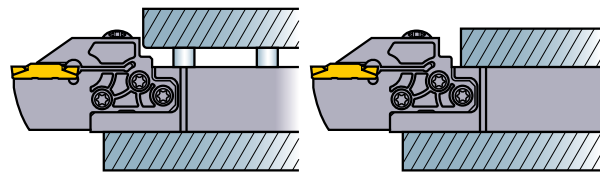
- If interference occurs even when the correct blade is used, the cutting edge height could be incorrect.
  - When interference occurs on the inner side of the blade, the cutting edge height is set too high.
  - When interference occurs on the outer side of the blade, the cutting edge height is set too low.

### Setting the tool



- Set the insert parallel to the central axis.

### Tool overhang



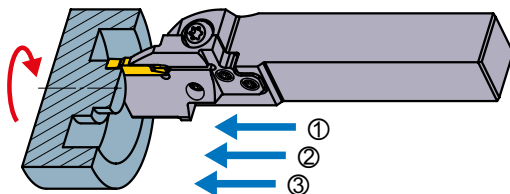
- When setting the tool, ensure that the overhang is as short as possible and avoid contact of the tool post with the top clamp as shown in the figures above.

## MACHINING RECOMMENDATIONS

### Notes when face grooving

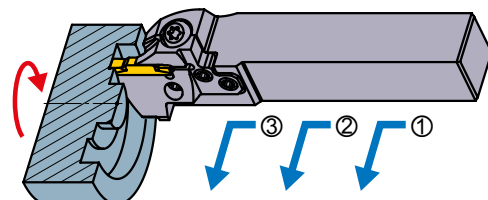
- Always machine from the outer diameter towards the centre.

#### Machining narrow grooves



- Plunging in several passes is recommended.

#### Machining wide grooves

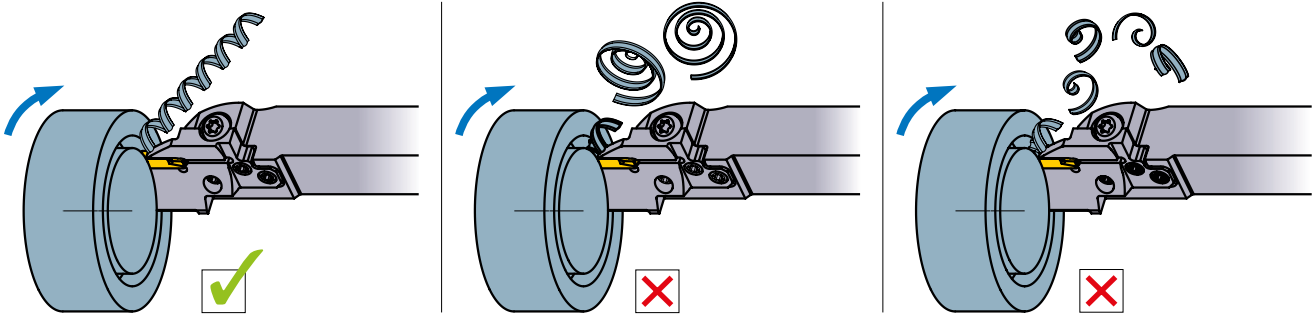


- Cross feed machining is recommended.

## MACHINING RECOMMENDATIONS

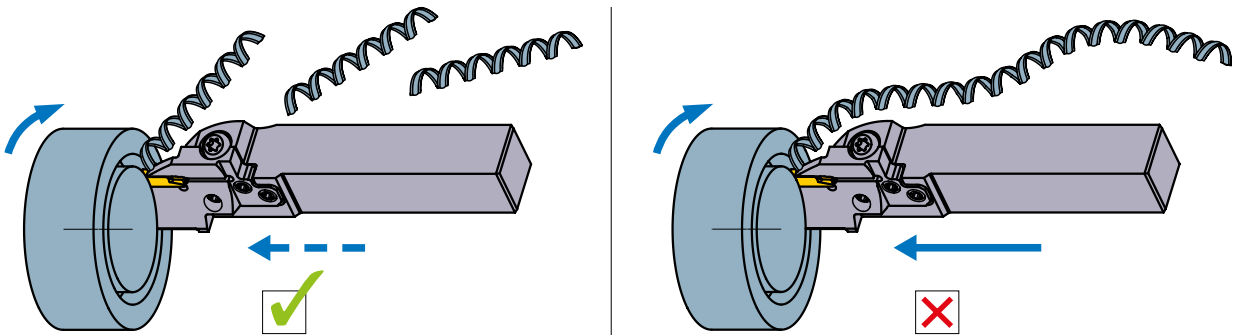
### Notes when face grooving

#### Notes on the first pass (1)



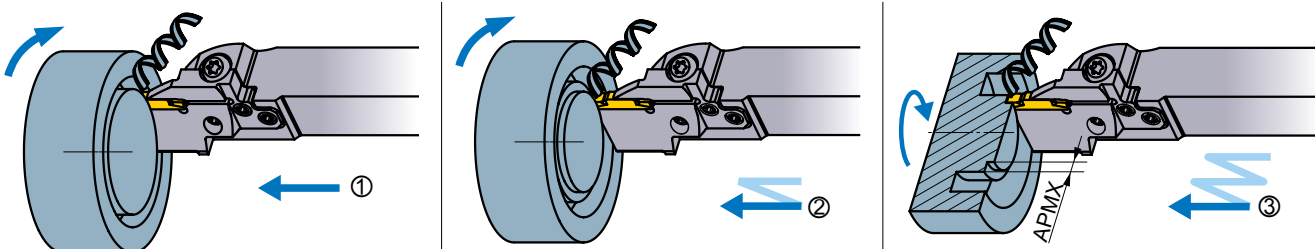
- During the first face grooving pass it is difficult to disperse broken chips and can lead to problems such as a chipped insert. Maintain longer chips that disperse easily by decreasing the feed per rotation.

#### Notes on the first pass (2)



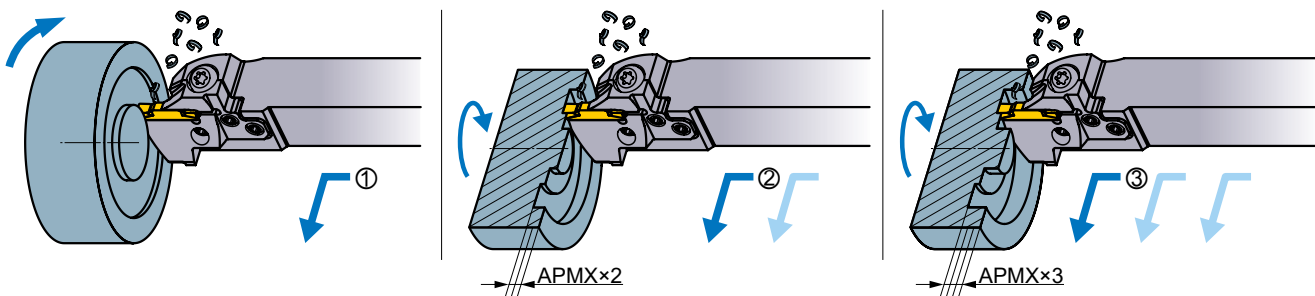
- When chips become too long, use peck feed to break them into a suitable length.

#### Notes when wide face grooving by plunging in several passes



- When machining a face groove in several passes, machine from the outer diameter towards the centre so that space for discharging chips is created to prevent insert damage caused by chip jamming.
- Plunging width of cut is recommended to be set at 60 - 80% of the insert width. This enhances the effect of the chipbreaker by enlarging the width of the groove to improve chip dispersal.

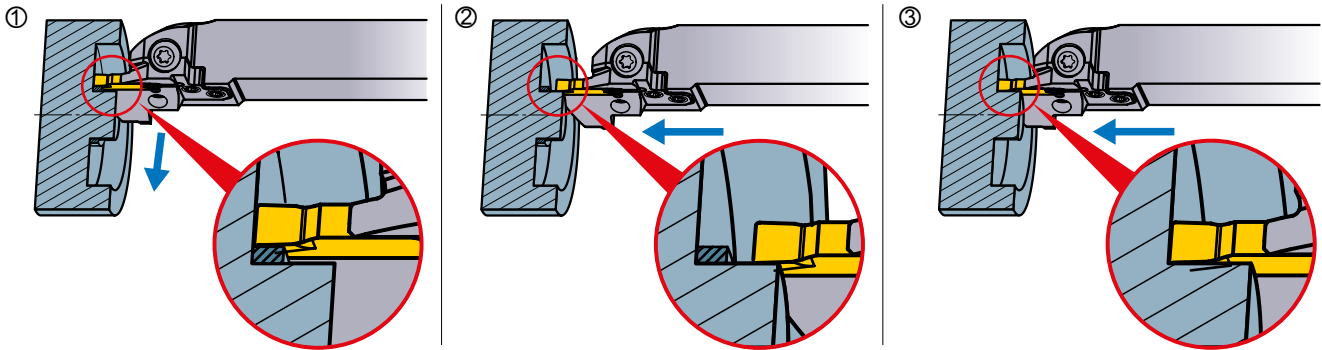
#### Notes when wide face grooving by combination of plunging and traverse machining (1)



- When face groove machining by using plunge feed and traverse machining, always machine from the outer diameter towards the centre to disperse chips outward to avoid chip jamming problems.
- Set the depth of cut within 40% of the insert width.

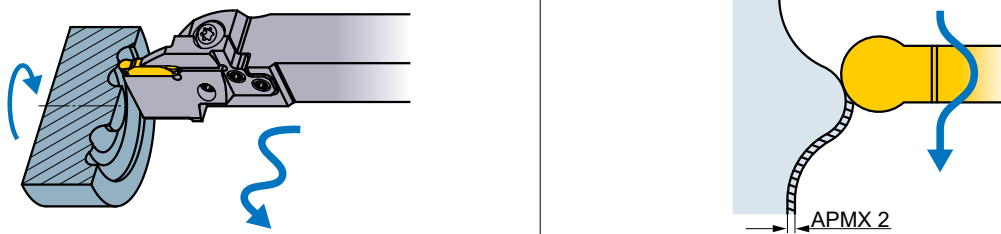


### Notes when wide face grooving by combination of plunging and traverse machining (2)



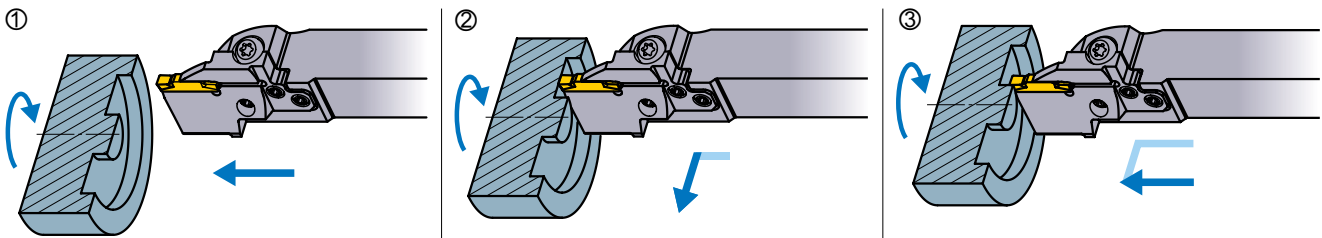
- When infeed machining at the bottom of a deep groove, chips may interfere on the cutting edge near the centre wall. In such cases, stop infeed machining just before the centre wall (at a point less than the insert width) then remove the remaining material by plunging.

### Notes when copying (BM Breaker)



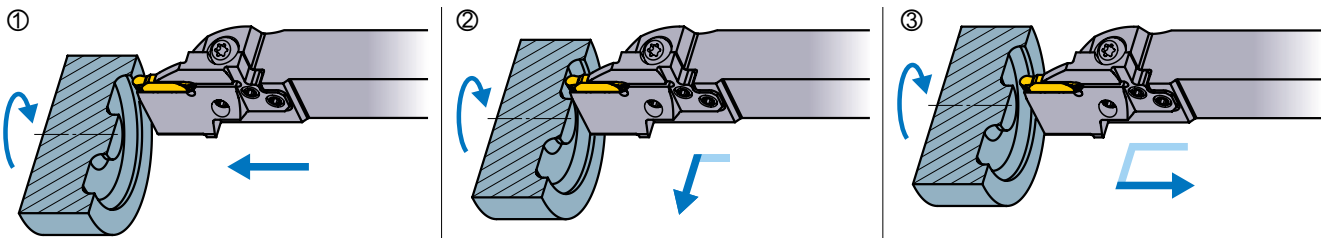
- With the BM breaker insert, 3 dimensional copying is possible. Set the depth of cut (APMX 2) to 30% less than the insert width.

### Finishing (1)

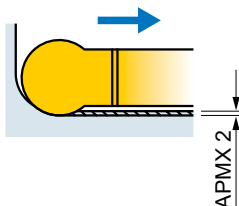


- When finish cutting, machine continuously from the outer wall to the bottom of the groove, then finally plunge cut the centre wall.

### Finishing (2) (BM Breaker)



- Carry out finishing in one process. For the depth of cut (APMX 2) when back turning, refer to the table on the right.



Insert	APMX 2 (mm)
GY2M0200D100N-BM	0.10
GY2M0250E125N-BM	
GY2M0300F150N-BM	
GY2M0318F159N-BM	0.15
GY2M0400G200N-BM	
GY2M0475H238N-BM	0.20
GY2M0500H250N-BM	
GY2M0600J300N-BM	0.25
GY2M0635J318N-BM	

# GROOVING / CUTTING OFF

## RECOMMENDED CUTTING SPEED [For Internal Grooving]

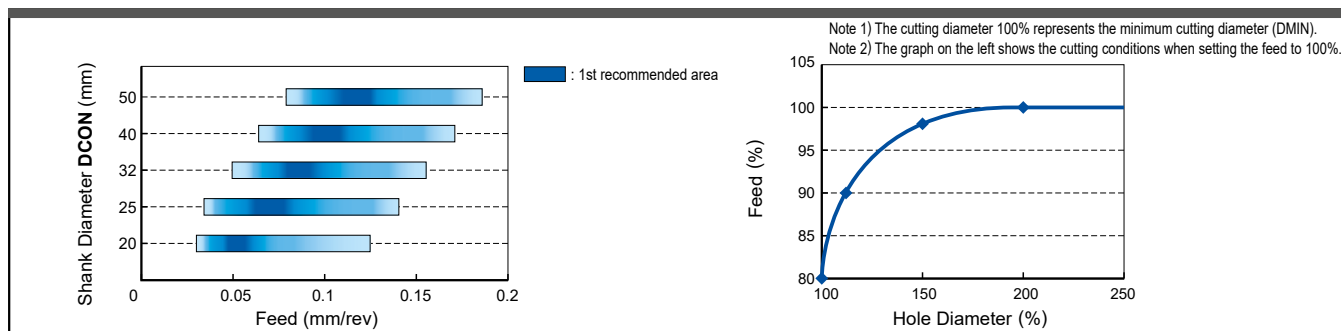
Work Material	Hardness	Grade	Cutting Speed (m/min)						
			50	100	150	200	250	300	400
P Mild Steel	≤160HB	VP20RT	80 — 180						
		VP10RT	90 — 190						
		NX2525	70 — 170						
	Carbon Steel Alloy Steel	160–280HB	VP20RT	60 — 140					
			VP10RT	70 — 150					
			MY5015	90 — 210					
		280HB≤	VP20RT	50 — 110					
			VP10RT	60 — 120					
M Stainless Steel	≤270HB	VP20RT	50 — 110						
		VP10RT	60 — 120						
	K Gray Cast Iron	Tensile Strength ≤300MPa	VP20RT	60 — 140					
			VP10RT	70 — 150					
			MY5015	90 — 210					
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT	50 — 110					
			VP10RT	60 — 120					
			MY5015	80 — 160					
S Heat Resistant Alloy Titanium Alloy	—	MP9015	40 — 100						
		MP9025	30 — 90						
		VP20RT	30 — 60						
		VP10RT/RT9010	40 — 70						
H Hardened steel	50HRC≤	BC8110	60 — 100						
N Aluminium Alloy	Content Si<5%	RT9010	150 — 400						
	Content 5%≤Si≤10%	RT9010	150 — 400						
	Content Si>10%	RT9010	80 — 160						

Note 1) VP20RT is the first recommended grade for materials other than hardened steels.

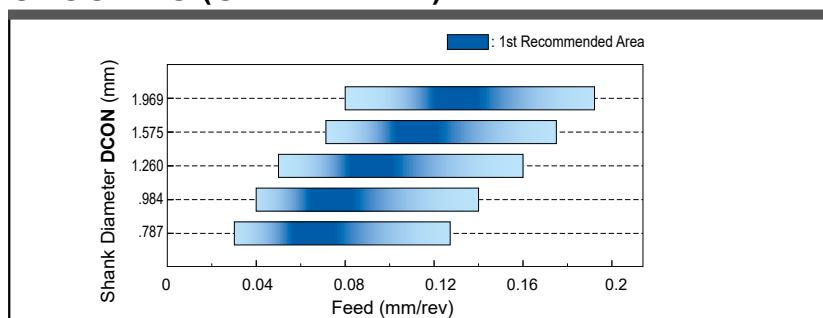
Note 2) For RT9010, VP10RT, VP20RT and MY5015, wet cutting is recommended.

## RECOMMENDED CUTTING CONDITIONS [For Internal Grooving]

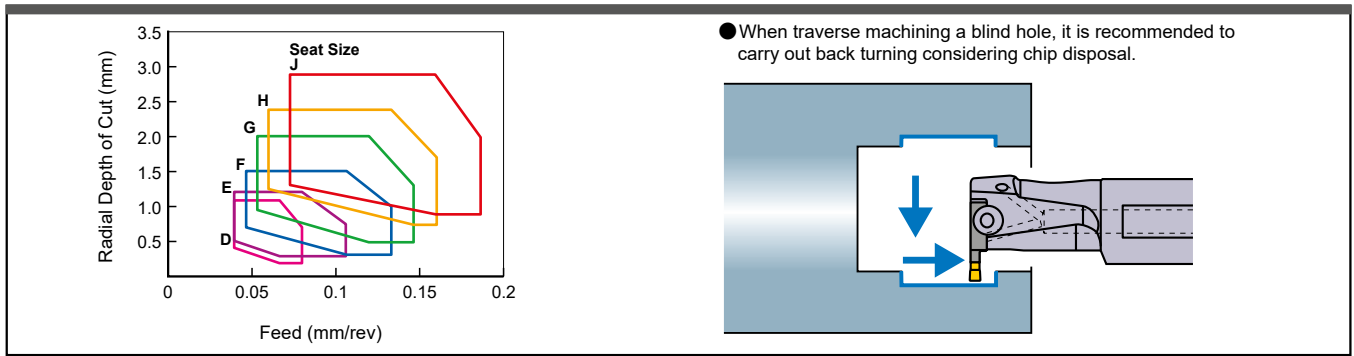
### GROOVING



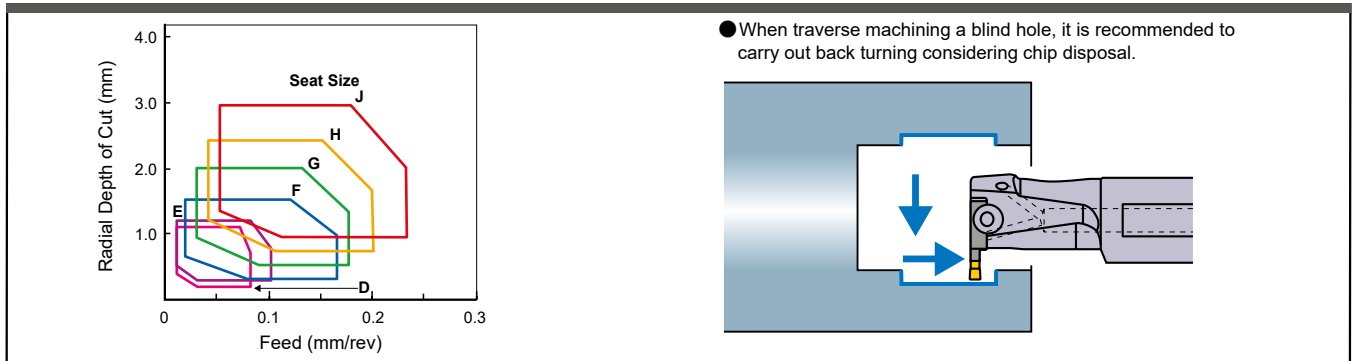
### GROOVING (GL BREAKER)



## TRAVERSE MACHINING (MF BREAKER)

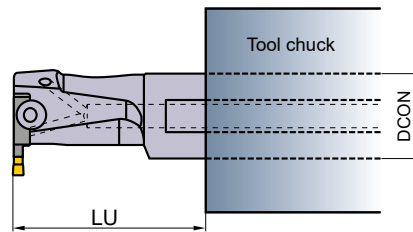


## TRAVERSE MACHINING (MM/MS BREAKER)



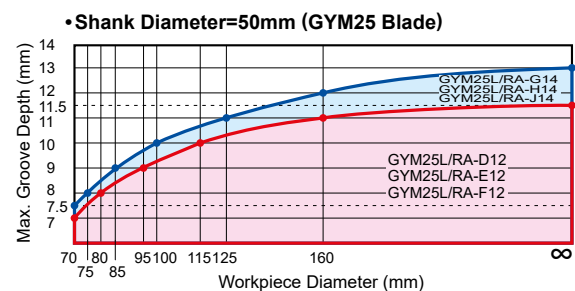
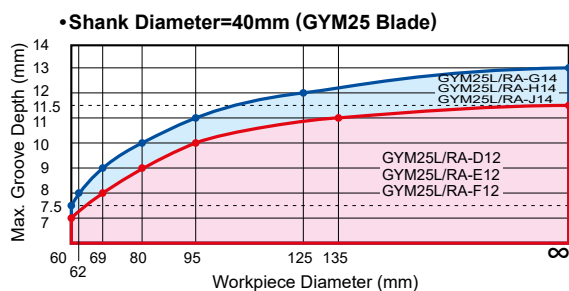
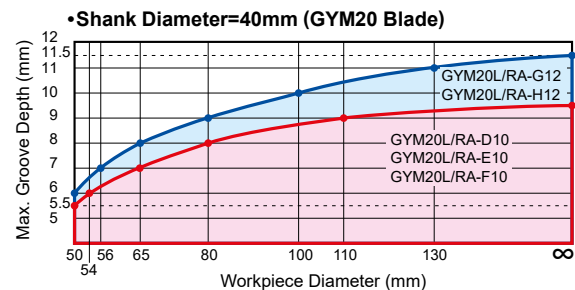
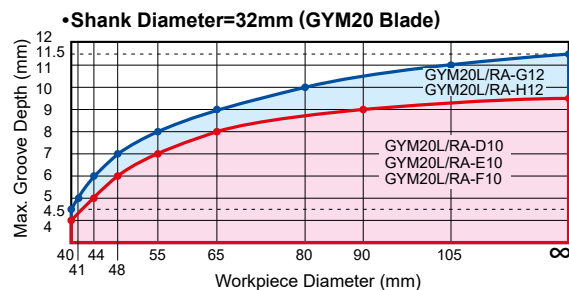
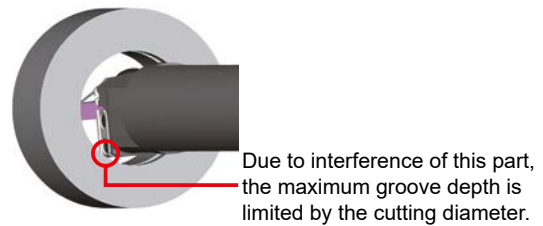
Note 1) The above cutting conditions are for when using the tool overhang (LU) 1.6-2.0 times larger than the shank diameter (DCON). (L/D=1.6-2.0)  
When using L/D larger than 2.0, reduce the cutting conditions.

Seat Size			
	Insert Width (mm)		
D	2.00	G	4.00
	2.24		4.24
E	2.39	H	4.75
	2.50		5.00
F	2.74	J	6.00
	3.00		6.31
G	3.18		6.35
	3.24		



## LIMITATION OF THE MAXIMUM GROOVE DEPTH [For Internal Grooving]

- When using the monoblock type  
The maximum groove depth is not limited by the cutting diameter.
- When using the modular blade type  
The maximum groove depth is limited by the cutting diameter.



## TOOL SELECTION

### Notes when selecting the tool body

**Holder**

● When the overhang is the same, select a holder with the largest possible shank size to ensure sufficient clamping rigidity.

**Modular blade (1)**

GYM20R/LA-D10	GYM25R/LA-D12
GYM20R/LA-E10	GYM25R/LA-E12
GYM20R/LA-F10	GYM25R/LA-F12
GYM20R/LA-G12	GYM25R/LA-G14
GYM20R/LA-H12	GYM25R/LA-H14
	GYM25R/LA-J14

● For an internal holder, select a modular blade listed above.

**Modular blade (2)**

● For a  $\varnothing 40$  shank holder, if there is no restriction for use, select a holder suitable for GYM25 blade.

### Notes when setting the tool

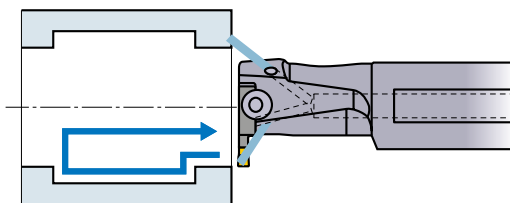
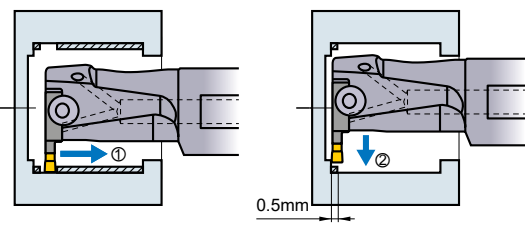
**Overhang**

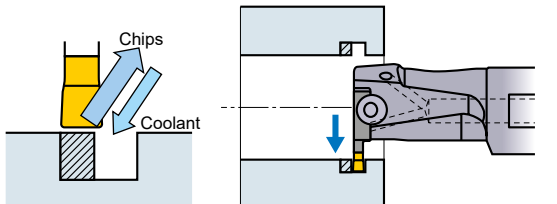
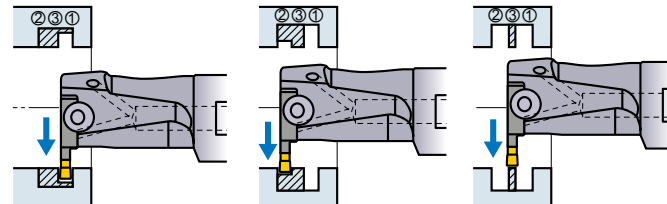
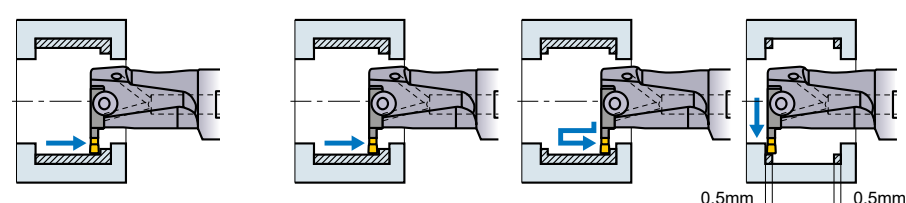
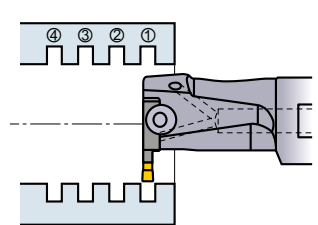
● The maximum groove depth is limited to the dimension LDRED. When machining with longer overhangs, refer to the dimension WF2 of the tool used.

# MACHINING RECOMMENDATIONS

## Notes on multi-function machining (MF, MS and MM breakers)

For internal grooving, the machining methods for external grooving can be used, but please note the following precautions.

Coolant	Machining blind holes
 <ul style="list-style-type: none"> <li>● Supply large amounts of coolant for effective chip disposal during cutting. Maintain supply until the tool has been retracted completely for improved chip disposal.</li> </ul>	 <ul style="list-style-type: none"> <li>● As continuous chips tend to elongate at the back of the bore, the above operation is recommended. The recommended width of cut for <math>\varnothing</math> is 0.5 mm.</li> </ul>

Machining Wide Grooves	
<p style="text-align: center;"><b>Grooving</b></p> <ul style="list-style-type: none"> <li>● When the cutting edge width is <math>\times 2 \geq</math> groove width</li> </ul>  <ul style="list-style-type: none"> <li>● When the depth of cut is shallower than the cutting edge width, continuous chips are usually produced. When plunging in several passes, it is recommended to carry out machining in the steps above. This ensures that coolant reaches the cutting edge and chips are easily discharged.</li> </ul>	<ul style="list-style-type: none"> <li>● When the cutting edge width is <math>\times 2 &lt;</math> groove width</li> </ul>  <ul style="list-style-type: none"> <li>● When the groove depth is larger than the cutting edge width, carry out plunging in the steps above to break up chips efficiently.</li> </ul>
<p style="text-align: center;"><b>Turning</b></p>  <ul style="list-style-type: none"> <li>● When chip breaking and disposal are especially important, cross-feed machining is recommended.</li> <li>● Wide face grooving when the corner R of the work piece is equal to the corner R of the insert, machine as shown above. (When corner R of the work piece is larger than corner R of the insert, refer to the description of external wide grooving.)</li> <li>● If the groove depth exceeds a given level, chips may elongate at the wall. In such a case, increase the feed and carry out machining as shown above.</li> </ul>	<p style="text-align: center;"><b>Machining instruction</b></p>  <ul style="list-style-type: none"> <li>● It is recommended to carry out grooving from the front end of the workpiece. This reduces workpiece deflection.</li> </ul>

F  
GROOVING / CUTTING OFF

# GW SERIES

## Easy to Utilise Configuration that Improves Tool Handling

### Clamping method

#### Simple insert clamping method offering high rigidity

To prevent extraction during machining, the insert features a reverse taper angle. Additionally the design also includes 3 large locating faces with the blade offering increased cutting edge reliability.

The blade itself is made from a suitable, special alloy steel. For changing the insert, a unique wrench is supplied to ensure ease of use.



Reverse Taper Angle

### Voice of the Developer

#### Easy insert setting

By using the unique wrench, it is possible to remove the insert with one simple action making it easier for everyday use in the workshop.

F

GROOVING / CUTTING OFF

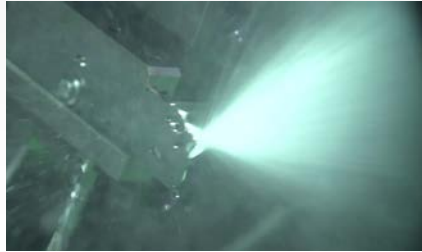


## Through Coolant Blade

### Increased wear resistance due to 2 through coolant holes

2 through holes supply coolant to both the rake and flank face, leading to effective cutting edge cooling and increased wear resistance.

Additionally the blade can also be utilised with both low and high pressure coolant (7MPa).



#### Voice of the Developer

##### Reduced heat generation

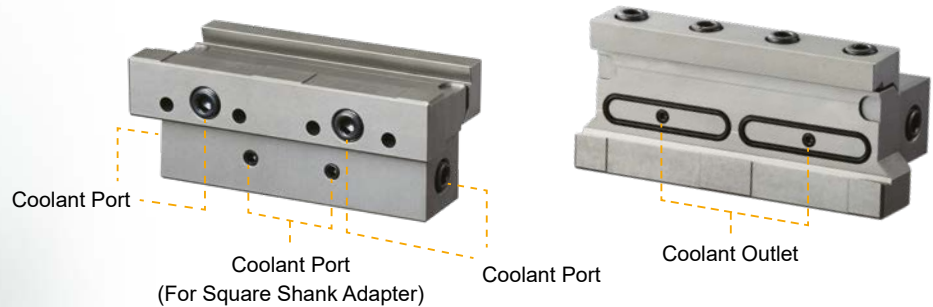
The 2 coolant holes used in the blade are capable of coping with pressures up to 7MPa. This is achieved by using as large as possible hole diameter. The coolant holes are located close to the cutting edge to improve cutting edge cooling effect and increasing wear resistance.

## Coolant Ports

### Flexibility with the use of 6 coolant ports

There are 6 coolant ports designed into the tool block, making it easy to set up the block and blade to a suitable configuration. The through coolant holes improve cutting edge cooling and chip evacuation.

The use of external coolant hoses is also possible.



#### Voice of the Developer

##### Possible to set up to suit the requirements of the workshop environment.

One of the objectives of this product is to respond to the customers complaints that "the product did not fit and could not be used". Starting with the coolant outlet that prevents leaks even when oil quantity or overhangs change, everything from the material and the shape of the O-ring, to the length of the hose has been tailored to the effective use in the workshop.

## Breaker System Offering Excellent Chip Disposal Properties

### Low Feeds



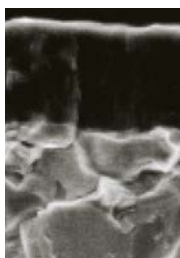
### Medium Feeds



## INSERT GRADE

Work Material / Machining Condition	P Steel	M Stainless Steel	K Cast Iron	S Heat Resistant Alloy / Titanium Alloy
Stable ↑ Machining Condition ↓ Unstable	MY5015		MY5015	VP10RT
	VP10RT	VP10RT	VP10RT	
	VP20RT	VP20RT	VP20RT	VP20RT
	VP30RT	VP30RT		

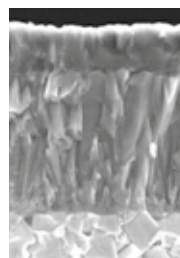
### VP20RT (1st Recommendation)



- PVD coated grade suitable for a wide range of applications. The combination of a special tough cemented carbide substrate with MIRACLE coating provides an excellent balance of wear and fracture resistance.

MIRACLE Coating  
Carbide Substrate (90.5HRA)

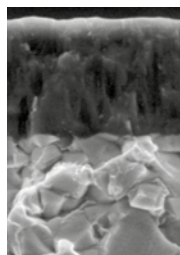
### MY5015



- CVD coated grade with excellent wear resistance even at high temperatures. Providing longer tool life when machining cast and ductile cast irons. Also suitable for high speed continuous cutting of steels.

CVD Coated Carbide  
Carbide Substrate

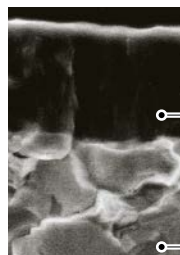
### VP10RT



- PVD coated grade with a cemented carbide substrate harder than VP20RT. For use on difficult-to-cut materials and for extending tool life.

MIRACLE Coating  
Carbide Substrate (92.0HRA)

### VP30RT



- A combination of a tough, special cemented carbide substrate and MIRACLE coating. Ideal for heavy interrupted cutting of stainless and general steels.

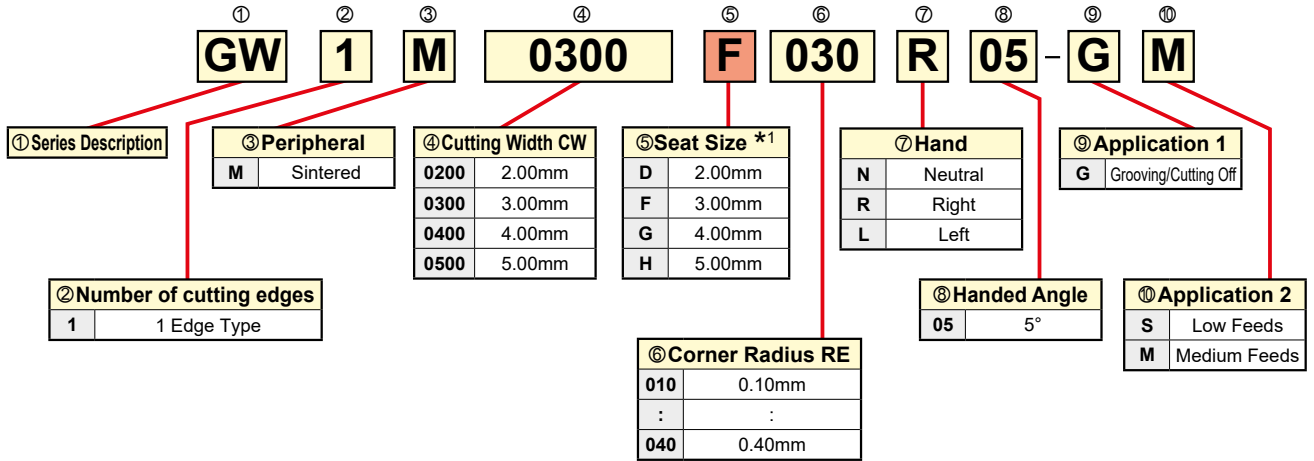
MIRACLE Coating (Al,Ti)N  
Carbide Substrate (88.8HRA)



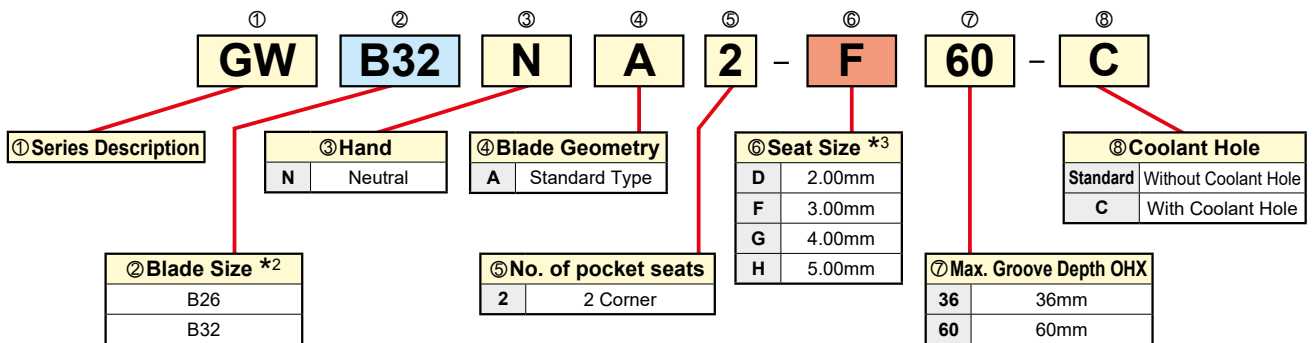
# GW SERIES ORDER NUMBER

## ■ Insert / Blade / Tool Block

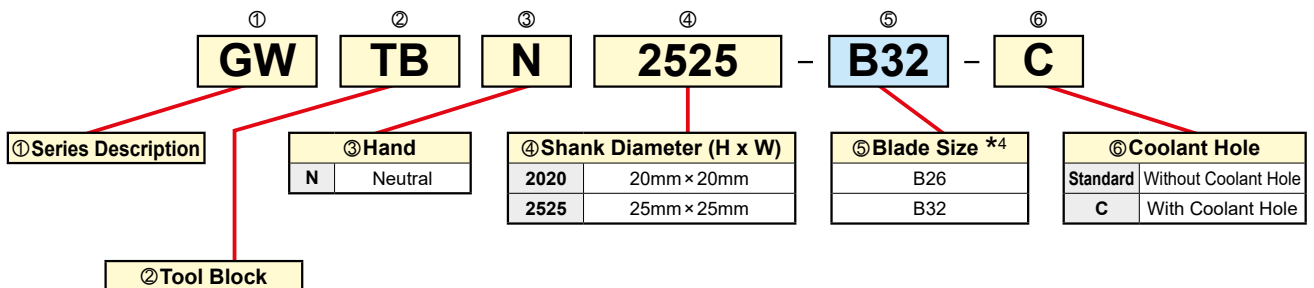
### ● Insert



### ● Blade



### ● Tool Block

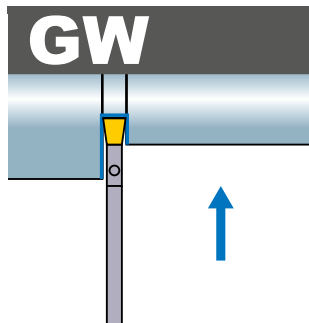


- \*1 Select seat size with the same symbol as the blade.
- \*2 Select blade size with the same symbol as the tool block.
- \*3 Select seat size with the same symbol as the insert.
- \*4 Select blade size with the same symbol as the blade.

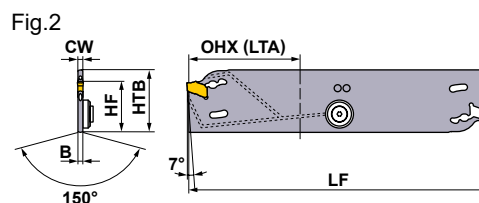
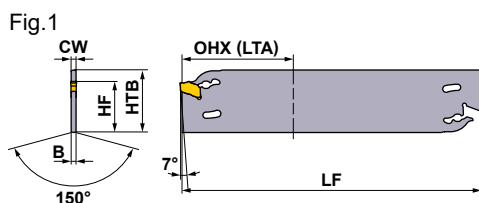
# GROOVING / CUTTING OFF

## GW BLADE

- Simple insert clamping method offering high rigidity.
- Possible to use with both external or through coolant.
- Groove Depth CW 2.0—5.0 mm



### For External Cutting Off / Grooving



Without Coolant Hole

(mm)

Seat Size	CW	*1 CUTDIA	Order Number	Stock	*2 OHN	*3 OHX (LTA)	B	LF	HTB	HF	Fig.	Insert Type		Wrench	Tool Block Type
												Insert Type	Wrench		
D	2.00	72	<b>GWB26NA2-D36</b>	●	16	36	1.55	110	26	21.4	1	GW1M0200D	GWY39L	GWY39L	GWTBN-B26
		120	<b>GWB32NA2-D60</b>	●	16	60	1.55	150	32	25	1	GW1M0200D	GWY39L	GWY39L	GWTBN-B32
F	3.00	72	<b>GWB26NA2-F36</b>	●	16	36	2.45	110	26	21.4	1	GW1M0300F	GWY39L	GWY39L	GWTBN-B26
		120	<b>GWB32NA2-F60</b>	●	16	60	2.45	150	32	25	1	GW1M0300F	GWY39L	GWY39L	GWTBN-B32
G	4.00	72	<b>GWB26NA2-G36</b>	●	19	36	3.35	110	26	21.4	1	GW1M0400G	GWY39L	GWY39L	GWTBN-B26
		120	<b>GWB32NA2-G60</b>	●	19	60	3.35	150	32	25	1	GW1M0400G	GWY39L	GWY39L	GWTBN-B32
H	5.00	72	<b>GWB26NA2-H36</b>	●	19	36	4.25	110	26	21.4	1	GW1M0500H	GWY39L	GWY39L	GWTBN-B26
		120	<b>GWB32NA2-H60</b>	●	19	60	4.25	150	32	25	1	GW1M0500H	GWY39L	GWY39L	GWTBN-B32

With Coolant Hole

(mm)

Seat Size	CW	*1 CUTDIA	Order Number	Stock	*2 OHN	*3 OHX (LTA)	B	LF	HTB	HF	Fig.	Insert Type		Wrench	Tool Block Type
												Insert Type	Wrench		
D	2.00	72	<b>GWB26NA2-D36-C</b>	●	16	36	1.55	110	26	21.4	2	GW1M0200D	GWY39L	GWY39L	GWTBN-B26-C
		120	<b>GWB32NA2-D60-C</b>	●	26	60	1.55	150	32	25	2	GW1M0200D	GWY39L	GWY39L	GWTBN-B32-C
F	3.00	72	<b>GWB26NA2-F36-C</b>	●	16	36	2.45	110	26	21.4	2	GW1M0300F	GWY39L	GWY39L	GWTBN-B26-C
		120	<b>GWB32NA2-F60-C</b>	●	26	60	2.45	150	32	25	2	GW1M0300F	GWY39L	GWY39L	GWTBN-B32-C
G	4.00	72	<b>GWB26NA2-G36-C</b>	●	19	36	3.35	110	26	21.4	2	GW1M0400G	GWY39L	GWY39L	GWTBN-B26-C
		120	<b>GWB32NA2-G60-C</b>	●	26	60	3.35	150	32	25	2	GW1M0400G	GWY39L	GWY39L	GWTBN-B32-C
H	5.00	72	<b>GWB26NA2-H36-C</b>	●	19	36	4.25	110	26	21.4	2	GW1M0500H	GWY39L	GWY39L	GWTBN-B26-C
		120	<b>GWB32NA2-H60-C</b>	●	26	60	4.25	150	32	25	2	GW1M0500H	GWY39L	GWY39L	GWTBN-B32-C

\*1 CUTDIA: Maximum Cut Off Diameter \*2 OHN: Minimum Overhang Length \*3 OHX(LTA): Maximum Overhang Length  
 Note 1) Recommended Maximum Coolant Pressure : 7MPa

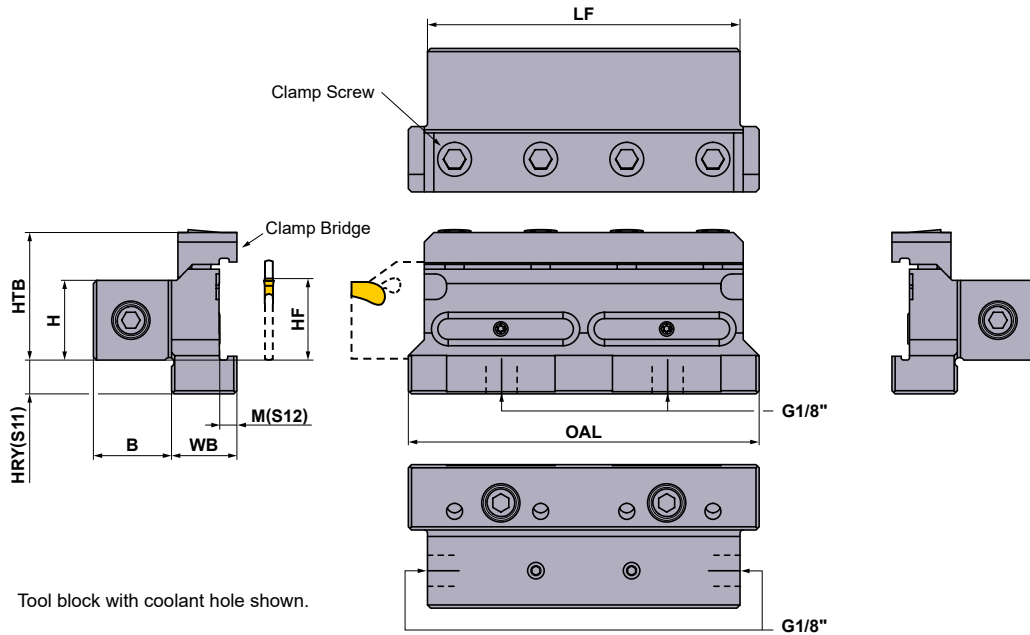
### Spare Parts for Blades with Coolant Hole

(mm)

Order Number	CW	Washer		Clamp Screw	Wrench
		①	②		
<b>GWB26NA2-D36-C</b>	2.0	①GWW04038		GW04005F	HKY20R
<b>GWB32NA2-D60-C</b>	2.0	①GWW04038		GW04005F	HKY20R
<b>GWB26NA2-F36-C</b>	3.0	①GWW04038		GW04005F	HKY20R
<b>GWB32NA2-F60-C</b>	3.0	①GWW04038		GW04005F	HKY20R
<b>GWB26NA2-G36-C</b>	4.0	②GWW04026		GW04005F	HKY20R
<b>GWB32NA2-G60-C</b>	4.0	②GWW04026		GW04005F	HKY20R
<b>GWB26NA2-H36-C</b>	5.0	②GWW04026		GW04005F	HKY20R
<b>GWB32NA2-H60-C</b>	5.0	②GWW04026		GW04005F	HKY20R

● : Inventory maintained. ★ : Inventory maintained in Japan.

## ■ Tool Block



Tool block with coolant hole shown.

Without Coolant Hole

Order Number	Stock	H	HF	HTB	HRY (S11)	B	WB	M (S12)	LF	OAL	①	*	
											Clamp Bridge	Clamp Screw	Wrench
<b>GWTBN2020-B26</b>	★	20	20	33.5	11	19.5	20.0	5.0	75	85	① GWCW1	HSC06020	HKY50R
<b>GWTBN2020-B32</b>	★	20	20	35.0	15.6	19.5	20.5	5.5	100	110	② GWCW2	HSC06020	HKY50R
<b>GWTBN2525-B26</b>	★	25	25	38.5	6	24.5	20.0	5.0	75	85	① GWCW1	HSC06020	HKY50R
<b>GWTBN2525-B32</b>	★	25	25	40.0	10.6	24.5	20.5	5.5	100	110	② GWCW2	HSC06020	HKY50R

With Coolant Hole

Order Number	Stock	H	HF	HTB	HRY (S11)	B	WB	M (S12)	LF	OAL	①	*	
											Clamp Bridge	Clamp Screw	Wrench
<b>GWTBN2020-B26-C</b>	●	20	20	33.5	11	19.5	20.0	5.0	75	85	① GWCW1	HSC06020	HKY50R
<b>GWTBN2020-B32-C</b>	●	20	20	35.0	15.6	19.5	20.5	5.5	100	110	② GWCW2	HSC06020	HKY50R
<b>GWTBN2525-B26-C</b>	●	25	25	38.5	6	24.5	20.0	5.0	75	85	① GWCW1	HSC06020	HKY50R
<b>GWTBN2525-B32-C</b>	●	25	25	40.0	10.6	24.5	20.5	5.5	100	110	② GWCW2	HSC06020	HKY50R

\* Clamp Torque (N · m) : HSC06020=7.0

Note 1) Recommended Maximum Coolant Pressure : 7MPa

## Spare Parts for Tool Block with Coolant Hole

Order Number	①					
	②	Plug	Plug	Wrench	Plug	Wrench
<b>GWTBN2020-B26-C</b>	ORGW332N9	HGJ-PT1/8	HSD05004S	HKY25R	CS300590T	TKY08R
<b>GWTBN2020-B32-C</b>	ORGW457N9	HGJ-PT1/8	HSD05004S	HKY25R	CS300590T	TKY08R
<b>GWTBN2525-B26-C</b>	ORGW332N9	HGJ-PT1/8	HSD05004S	HKY25R	CS300590T	TKY08R
<b>GWTBN2525-B32-C</b>	ORGW457N9	HGJ-PT1/8	HSD05004S	HKY25R	CS300590T	TKY08R

# GROOVING / CUTTING OFF

## Inserts

(mm)

Application	Order Number	Stock						CW		REL	RER	PSIRR PSIRL	Geometry
		Coating				Carbide		Cutting Width	Tolerance				
		MY5015	VP10RT	VP20RT	VP30RT	RT9010	RT9020						
Grooving, Cutting Off	<b>GW1M0200D020N-GS</b>	●	●	●				2.00	±0.03	0.2	0.2	—	
Grooving, Cutting Off	<b>GW1M0300F020N-GS</b>	●	●	●				3.00	±0.03	0.2	0.2	—	
Grooving, Cutting Off	<b>GW1M0400G020N-GS</b>	●	●	●				4.00	±0.04	0.2	0.2	—	
Grooving, Cutting Off	<b>GW1M0500H030N-GS</b>	●	●	●				5.00	±0.04	0.3	0.3	—	
Grooving, Cutting Off	<b>GW1M0200D020N-GM</b>	●	●	●				2.00	±0.03	0.2	0.2	—	
Grooving, Cutting Off	<b>GW1M0300F030N-GM</b>	●	●	●				3.00	±0.03	0.3	0.3	—	
Grooving, Cutting Off	<b>GW1M0400G030N-GM</b>	●	●	●				4.00	±0.04	0.3	0.3	—	
Grooving, Cutting Off	<b>GW1M0500H040N-GM</b>	●	●	●				5.00	±0.04	0.4	0.4	—	
Cutting off, Low Feed	<b>NEW GW1M0200D020R05-GS</b>	★	★	★				2.00	±0.03	0.2	0.2	5	
Cutting off, Low Feed	<b>NEW GW1M0300F020R05-GS</b>	★	★	★				3.00	±0.03	0.2	0.2	5	
Cutting off Low Feed, Lead Angle 8°	<b>NEW GW1M0200D003R08-GS</b>	★	★	★				2.00	±0.03	0.03	0.03	8	
Cutting off Low Feed, Lead Angle 8°	<b>NEW GW1M0300F003R08-GS</b>	★	★	★				3.00	±0.03	0.03	0.03	8	
Cutting Off	<b>GW1M0200D020R05-GM</b>	●	●	●				2.00	±0.03	0.2	0.2	5	 Right hand insert shown.
Cutting Off	<b>GW1M0200D020L05-GM</b>	●	●	●				2.00	±0.03	0.2	0.2	5	
Cutting Off	<b>GW1M0300F030R05-GM</b>	●	●	●				3.00	±0.03	0.3	0.3	5	
Cutting Off	<b>GW1M0300F030L05-GM</b>	●	●	●				3.00	±0.03	0.3	0.3	5	
Cutting Off	<b>GW1M0400G030R05-GM</b>	●	●	●				4.00	±0.04	0.3	0.3	5	
Cutting Off	<b>GW1M0400G030L05-GM</b>	●	●	●				4.00	±0.04	0.3	0.3	5	
Cutting Off	<b>GW1M0500H040R05-GM</b>	●	●	●				5.00	±0.04	0.4	0.4	5	
Cutting Off	<b>GW1M0500H040L05-GM</b>	●	●	●				5.00	±0.04	0.4	0.4	5	
Blank	<b>NEW GW1B0320D020N</b>					★	★	3.24	±0.10	0.2	0.2	—	
Blank	<b>NEW GW1B0440F020N</b>					★	★	4.44	±0.10	0.2	0.2	—	
Blank	<b>NEW GW1B0540G020N</b>					★	★	5.44	±0.10	0.2	0.2	—	
Blank	<b>NEW GW1B0640H020N</b>					★	★	6.44	±0.10	0.2	0.2	—	

Note 1) Blank inserts to be ground by customers.

## Proper Use of GW Series Right Hand Inserts

### First Recommendation

Improved Fracture Resistance

Reduction of Burrs and Core Residue

**GM Breaker**

PSIRR=5°  
RE=0.20

**GS Breaker**

PSIRR=5°  
RE=0.20

**GS Breaker**

PSIRR=8°  
RE=0.03

Reduction of Cutting Resistance

Improved Fracture Resistance








● : Inventory maintained. ★ : Inventory maintained in Japan.

(10 inserts in one case)

## Coolant Hose Kit

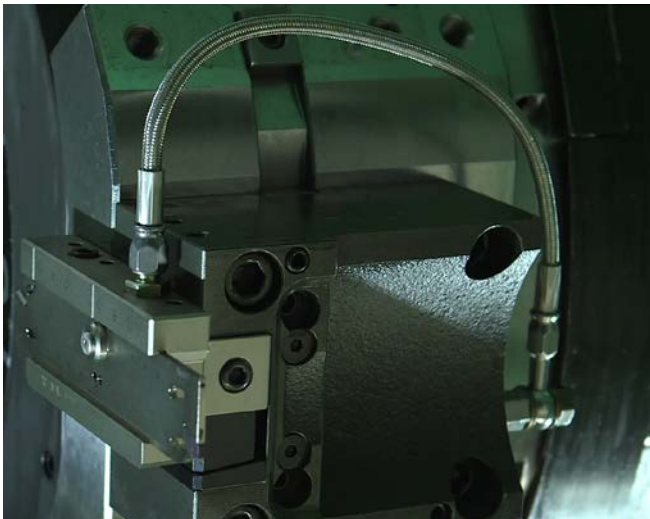
(mm)

Connector Type	Order Number	Stock	Hose Length	Kit Details								
												
				Code No.	Code No.	QTY.	Code No.	QTY.	Code No.	QTY.	Code No.	QTY.
Straight	<b>CS-1/8-150SS</b>	●	150	HOSE-1/8-150	—	—	—	—	AD-G1/8	2	WA-M10	2
Straight	<b>CS-1/8-200SS</b>	●	200	HOSE-1/8-200	—	—	—	—	AD-G1/8	2	WA-M10	2
Straight	<b>CS-1/8-250SS</b>	●	250	HOSE-1/8-250	—	—	—	—	AD-G1/8	2	WA-M10	2
Straight	<b>CS-1/8-300SS</b>	●	300	HOSE-1/8-300	—	—	—	—	AD-G1/8	2	WA-M10	2
Elbow Straight	<b>CS-1/8-150BS</b>	●	150	HOSE-1/8-150	AD-BM10	1	BB-G1/8	1	AD-G1/8	1	WA-M10	3
Elbow Straight	<b>CS-1/8-200BS</b>	●	200	HOSE-1/8-200	AD-BM10	1	BB-G1/8	1	AD-G1/8	1	WA-M10	3
Elbow Straight	<b>CS-1/8-250BS</b>	●	250	HOSE-1/8-250	AD-BM10	1	BB-G1/8	1	AD-G1/8	1	WA-M10	3
Elbow Straight	<b>CS-1/8-300BS</b>	●	300	HOSE-1/8-300	AD-BM10	1	BB-G1/8	1	AD-G1/8	1	WA-M10	3
Elbow	<b>CS-1/8-150BB</b>	●	150	HOSE-1/8-150	AD-BM10	2	BB-G1/8	2	—	—	WA-M10	4
Elbow	<b>CS-1/8-200BB</b>	●	200	HOSE-1/8-200	AD-BM10	2	BB-G1/8	2	—	—	WA-M10	4
Elbow	<b>CS-1/8-250BB</b>	●	250	HOSE-1/8-250	AD-BM10	2	BB-G1/8	2	—	—	WA-M10	4
Elbow	<b>CS-1/8-300BB</b>	●	300	HOSE-1/8-300	AD-BM10	2	BB-G1/8	2	—	—	WA-M10	4

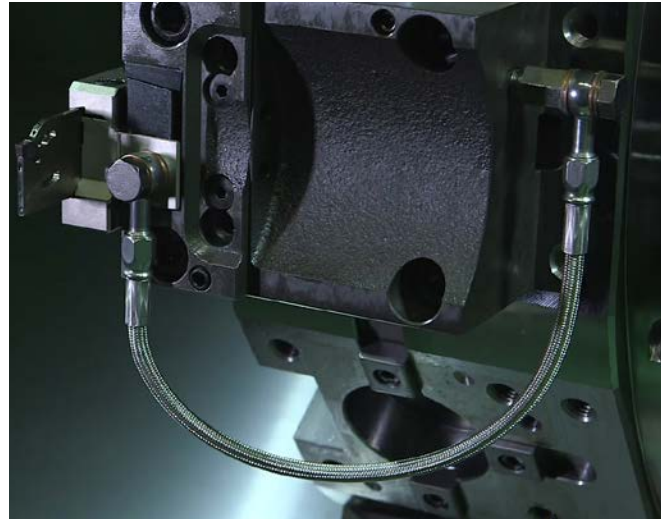
Connection Screw Size = G1/8"

## Mounting Example

Elbow Straight Type



Elbow Type



F

GROOVING / CUTTING OFF

## RECOMMENDED CUTTING CONDITIONS

### ■ Cutting Speed

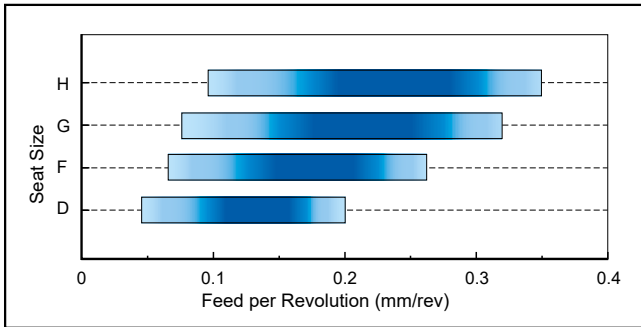
Work Material	Hardness	Grade	Cutting Speed (m/min)					
			50	100	150	200	250	300
P Mild Steel  Carbon Steel Alloy Steel	≤160HB	VP20RT		100		240		
		VP10RT		110		250		
	160–280HB	VP20RT	80		200			
		VP10RT	90		210			
		VP30RT	60		180			
		MY5015		110		250		
	≥280HB	VP20RT	60		160			
		VP10RT	70		170			
		VP30RT	40		140			
		MY5015		90		210		
M Stainless Steel	≤270HB	VP20RT	60		180			
		VP10RT	70		190			
		VP30RT	40		160			
K Gray Cast Iron  Ductile Cast Iron	Tensile Strength ≤300MPa	VP20RT		80		200		
		VP10RT		90		210		
		MY5015			140		300	
	Tensile Strength ≤800MPa	VP20RT	60		160			
		VP10RT	70		170			
		MY5015		90		210		
S Heat Resistant Alloy Titanium Alloy	—	VP20RT	30	60				
		VP10RT	40	70				

Note 1) VP20RT is the first recommended grade for general materials.

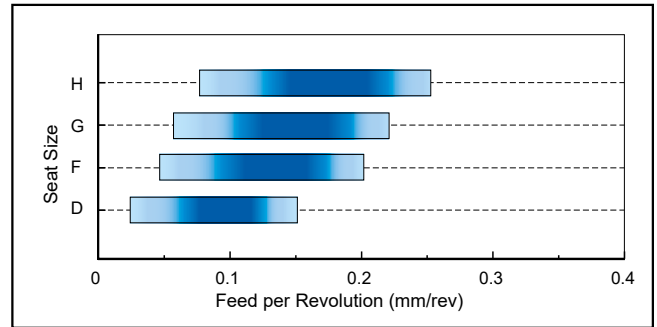
Note 2) For VP10RT, VP20RT, VP30RT and MY5015, wet cutting is recommended.

## ■ Feed per Revolution

### GM Breaker



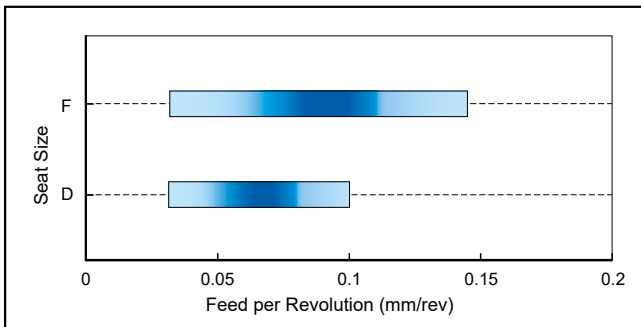
### GS Breaker



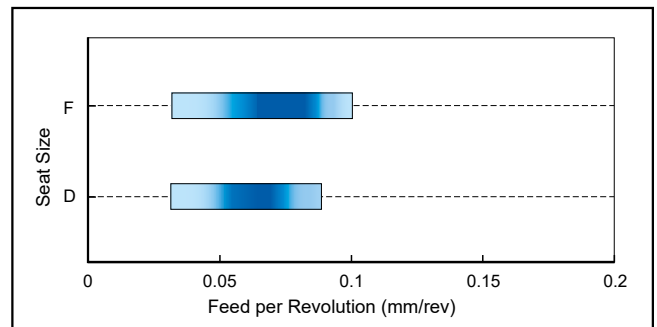
Chipbreaker	Feed per Revolution (mm/rev)			
	Seat Size D	Seat Size F	Seat Size G	Seat Size H
GM Breaker	0.05–0.20	0.07–0.26	0.08–0.32	0.10–0.35
GS Breaker	0.03–0.15	0.05–0.20	0.06–0.22	0.08–0.25

## ■ Cutting Off Feed per Revolution

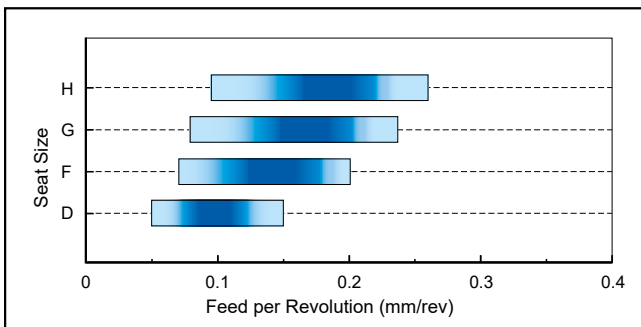
### R05-GS Breaker



### R08-GS Breaker



### R/L05-GM Breaker

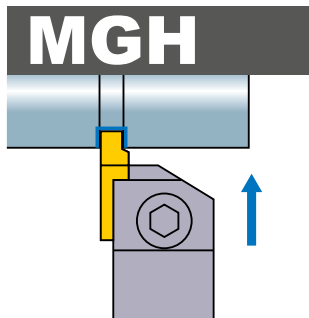


Chipbreaker	PSIPR	Hand	Feed per Revolution (mm/rev)			
			Seat Size D	Seat Size F	Seat Size G	Seat Size H
R05-GS	5°	R	0.03–0.10	0.03–0.14	–	–
R08-GS	8°	R	0.03–0.08	0.03–0.14	–	–
R05-GM	5°	R/L	0.05–0.15	0.07–0.20	0.08–0.23	0.10–0.26

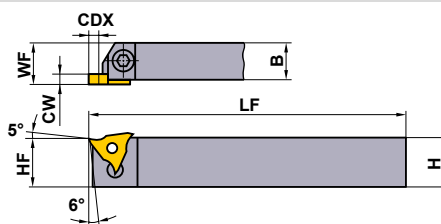
# GROOVING / CUTTING OFF

## MG HOLDER

- Clamp-on type
- Positive insert suffers from negligible chattering and thus produces a good finished surface.
- Cutting width CW 1.25–6.0mm



### External grooving







Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions(mm)						
	R	L		CW	CDX	H	B	LF	HF	WF
MGHR/L2020K3315	●	●	MGTR/L 33125   33400	1.25	1.2	20	20	125	20	20.2
MGHR/L2020K3323	●	●		1.45	1.5					
				$1.5 \leq CW \leq 2.3$	3.0					
MGHR/L2525M3315	●	●	MGTR/L 43125   43470	2.3 < CW ≤ 3.3	3.0	20	20	125	20	20.2
MGHR/L2525M3323	●	●		1.25	1.2					
MGHR/L2525M3333	★	●		1.45	1.5					
				$1.5 \leq CW \leq 2.3$	3.0	25	25	150	25	25.2
			$2.3 < CW \leq 3.3$	3.0						
			$3.3 < CW \leq 4.7$	3.0						
MGHR/L2020K4315	●	●	MGTR/L 44500   44600	1.25	1.2 (2.0)*	20	20	125	20	20.2
MGHR/L2020K4323	●	●		1.45	1.5					
MGHR/L2020K4333	●	●		$1.5 \leq CW \leq 2.3$	3.0 (3.5)*					
				$2.3 < CW \leq 3.3$	4.5 (4.0)*	20	20	125	20	20.2
			$3.3 < CW \leq 4.7(4.0)*$	4.5 (5.0)*						
			1.25	1.2 (2.0)*						
MGHR/L2525M4315	●	●	MGTR/L 44500   44600	1.45	1.5	25	25	150	25	25.2
MGHR/L2525M4323	●	●		$1.5 \leq CW \leq 2.3$	3.0 (3.5)*					
MGHR/L2525M4333	★	●		$2.3 < CW \leq 3.3$	4.5 (4.0)*					
				$3.3 < CW \leq 4.7(4.0)*$	4.5 (5.0)*	25	25	150	25	25.2
			4.7 < CW ≤ 6.3	4.5						

\* Dimensions when installing the CBN insert.

## SPARE PARTS

Order Number		 *		
MGHR/L2020K3315   MGHR/L2525M4447	Clamp Bridge MTK1R/L	Clamp Screw HBH06020	Spring MES3	Wrench HKY40R

\* Clamp Torque (N · m) : HBH06020=7.0

## RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel Alloy Steel	180–280HB	VP20MF	120 (100–140)	0.14 (0.03–0.25)
			NX2525	130 (100–160)	0.12 (0.03–0.2)
M	Stainless Steel	≤200HB	VP20MF	120 (100–140)	0.12 (0.03–0.18)
K	Gray Cast Iron	Tensile Strength ≤350MPa	VP20MF	120 (100–140)	0.12 (0.03–0.18)

Note 1) For machining a narrow groove, apply a lower feed within the recommended range.

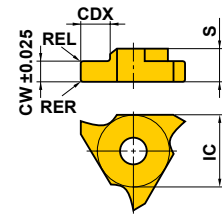
● : Inventory maintained. ★ : Inventory maintained in Japan.

(10 inserts in one case) (CBN inserts are available in 1 piece in one case.)



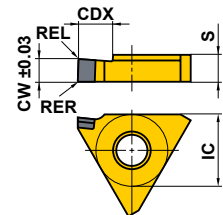
# INSERTS

Order Number	Stock						Dimensions (mm)					Geometry
	Coated		Cermet		Carbide		CW	CDX	IC	S	RER/L	
	VP20MF		NX2525		UT120T							
	R	L	R	L	R	L						
MGTR/L33125	★	★	★		●	●	1.25	1.2	9.525	4.76	0.2	MGTR/L...
MGTR/L33145	★	★	★		●	★	1.45	1.5	9.525	4.76	0.2	
MGTR/L33150	★	★	★	★	●	●	1.5	3	9.525	4.76	0.2	
MGTR/L33175	★	★	★	★	●	●	1.75	3	9.525	4.76	0.2	
MGTR/L33200	★	★	★	★	●	●	2	3	9.525	4.76	0.2	
MGTR/L33230	★	★			●	●	2.3	3	9.525	4.76	0.2	
MGTR/L33250	★	★	★	★	●	●	2.5	3	9.525	4.76	0.3	
MGTR/L33270	★	★			●	★	2.7	3	9.525	4.76	0.3	
MGTR/L33280	★	★			●	★	2.8	3	9.525	4.76	0.3	
MGTR/L33300	★	★	★	★	●	●	3	3	9.525	4.76	0.3	
MGTR/L33320	★	★			●		3.2	3	9.525	4.76	0.3	
MGTR/L33330		★			●	★	3.3	3	9.525	4.76	0.3	
MGTR/L33350	★	★	★		●	★	3.5	3	9.525	4.76	0.3	
MGTR/L33400	★	★	★	★	●	●	4	3	9.525	4.76	0.3	
MGTR/L43125	★	★	★	★	●	●	1.25	1.2	12.7	4.76	0.2	
MGTR/L43145	★	★		★	●	★	1.45	1.5	12.7	4.76	0.2	
MGTR/L43150	★	★	★	●	●	●	1.5	3	12.7	4.76	0.2	
MGTR/L43175	★	★	★	★	●	●	1.75	3	12.7	4.76	0.2	
MGTR/L43200	★	★	★	●	●	●	2	3	12.7	4.76	0.2	
MGTR/L43230	★	★	●	★	●	●	2.3	3	12.7	4.76	0.2	
MGTR/L43250	★	★	★	★	●	●	2.5	4.5	12.7	4.76	0.3	
MGTR/L43260	★	★	★		●	●	2.6	4.5	12.7	4.76	0.3	
MGTR/L43270	★	★			●	★	2.7	4.5	12.7	4.76	0.3	
MGTR/L43280		★		★	●	●	2.8	4.5	12.7	4.76	0.3	
MGTR/L43300	★	★	★	★	●	●	3	4.5	12.7	4.76	0.3	
MGTR/L43320	★				●	●	3.2	4.5	12.7	4.76	0.3	
MGTR/L43330		★		★	●	●	3.3	4.5	12.7	4.76	0.3	
MGTR/L43350	★	★	★	★	●	●	3.5	4.5	12.7	4.76	0.3	
MGTR/L43400	★	★	★		●	●	4	4.5	12.7	4.76	0.3	
MGTR/L43420	★	★	★		●	●	4.2	4.5	12.7	4.76	0.4	
MGTR/L43430	★	★	★		●	●	4.3	4.5	12.7	4.76	0.4	
MGTR/L43450	★	★	●	★	●	●	4.5	4.5	12.7	4.76	0.4	
MGTR/L43470	★	★	★	★	●	★	4.7	4.5	12.7	4.76	0.4	
MGTR/L44500	★	★			●	★	5	4.5	12.7	6.35	0.4	
MGTR/L44550	★				●		5.5	4.5	12.7	6.35	0.4	
MGTR/L44600	★				●	●	6	4.5	12.7	6.35	0.4	



Right hand insert shown.

CBN Insert



Right hand insert only.  
\*RER=0.2 REL=0.2

T  
GROOVING / CUTTING OFF

# GROOVING / CUTTING OFF

## MICRO-MINI

- Solid carbide type with min. cutting diameter 3.2mm.
- l/d is 5 times the diameter.
- Insert can be ground to suit the application.
- Suitable for a wide range of tooling including threading and grooving.

### MICRO-MINI STANDARD (SOLID CARBIDE BORING BAR)

Order Number	Stock	Dimensions (mm)						Geometry
		TF15	CW	DCON	LF	LDRED	DMIN*	
C03FR-BLS	★	2.0	3	80	15	3.2	1.0	
C04FR-BLS	★	2.5	4	80	20	4.2	1.5	
C05HR-BLS	★	3.0	5	100	25	5.2	2.0	

Right hand tool only.

\* DMIN : Min. Cutting Diameter

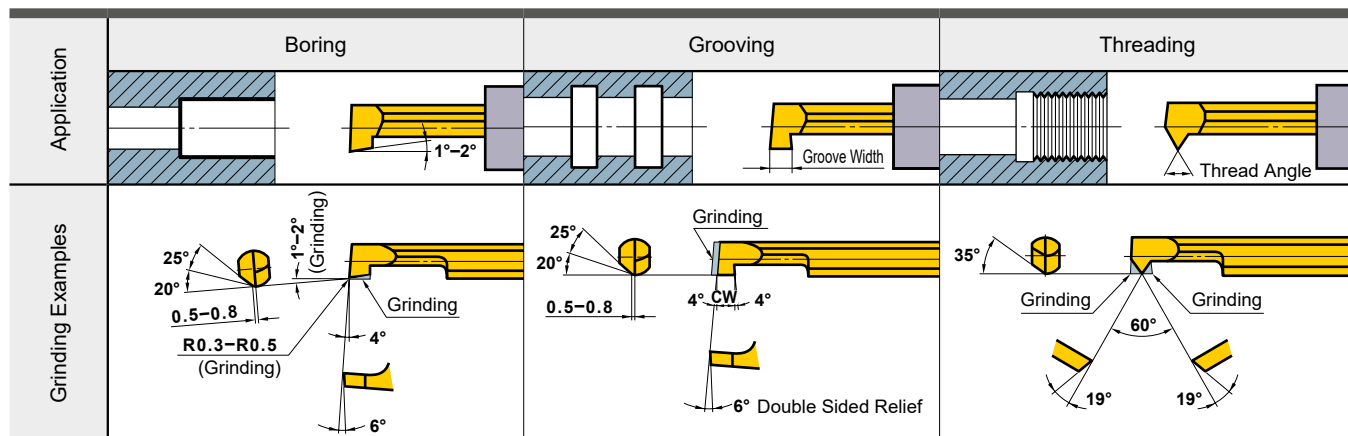
### RECOMMENDED CUTTING CONDITIONS

	Work Material	Cutting Speed (m/min)	Feed (mm/rev)	Depth of Cut (mm)	Excrecence Quantity (l/d)	Edge Condition	
						Corner Radius or BCH *	Honing *
P	Carbon Steel · Alloy Steel 180-280HB	40 (30-50)	0.05 (-0.1)	0.2 (0.1-0.3)	5	0.1-0.5	0.01-0.05
M	Stainless Steel ≤200HB	40 (30-50)	0.05 (-0.1)	0.2 (0.1-0.3)	5	≤0.4	≤0.03 (Honing not required)
K	Gray Cast Iron ≤350MPa	40 (30-50)	0.05 (-0.05)	0.2 (0.1-0.3)	5	0.1-0.5	0.01-0.05
N	Non-ferrous Metal	80 (60-100)	0.05 (-0.1)	0.3 (0.1-0.5)	5	0.1-0.5	≤0.03 (Honing not required)

\* Cutting edge is not honed. Please hone according to the workpiece before machining.

### GRINDING THE CUTTING EDGE OF MICRO-MINI

- MICRO-MINI can be used for boring and grooving as it is. But, it can also be reground as shown below.
- For shaping and regrinding, use diamond whetstone approximately #250-#400. Please grind according to application using the figure below as a reference.

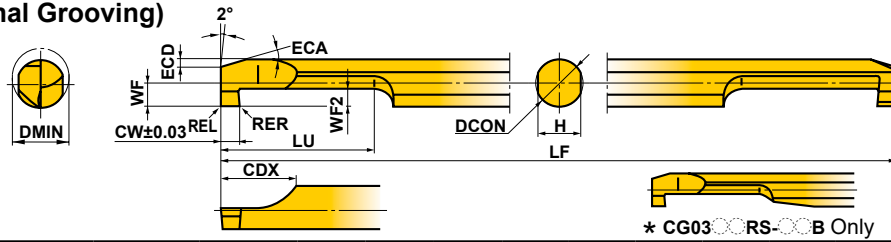


● : Inventory maintained. ★ : Inventory maintained in Japan.

(MICRO MINI is available in 1 piece in one pack.) (MICRO-MINI TWIN is available in 1 piece in one pack.)

# MICRO-MINI TWIN

## ■CG TYPE (Internal Grooving)

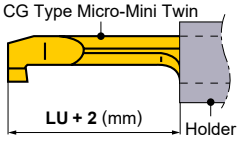


Order Number	Stock		Breaker	Dimensions (mm)											
	Micro Grain Carbide	Coated		DMIN	CW	WF2	RER/L	DCON	LF	LU	CDX	WF	H	ECA	ECD
	TF15	VP15TF													
CG0305RS-10	★	●	Without	3	1	1	0.05	3	50	5	6	1.3	2.7	15°	0.3
CG0305RS-10B	★	★	With	3	1	1	0.05	3	50	5	6	1.3	2.7	15°	0.3
CG0306RS-20	★	★	Without	3	2	1	0.1	3	50	6	6	1.3	2.7	15°	0.3
CG0306RS-20B	★	★	With	3	2	1	0.1	3	50	6	6	1.3	2.7	15°	0.3
CG03RS-10	★	●	Without	3	1	1	0.05	3	50	10	6	1.3	2.7	15°	0.3
CG03RS-10B	★	★	With	3	1	1	0.05	3	50	10	6	1.3	2.7	15°	0.3
CG03RS-20	★	★	Without	3	2	1	0.1	3	50	11	6	1.3	2.7	15°	0.3
CG03RS-20B	★	★	With	3	2	1	0.1	3	50	11	6	1.3	2.7	15°	0.3
CG0407RS-10	★	★	Without	4	1	1.5	0.05	4	60	7	7	1.8	3.6	15°	0.5
CG0407RS-10B	★	★	With	4	1	1.5	0.05	4	60	7	7	1.8	3.6	15°	0.5
CG0408RS-20	★	★	Without	4	2	1.5	0.1	4	60	8	7	1.8	3.6	15°	0.5
CG0408RS-20B	★	★	With	4	2	1.5	0.1	4	60	8	7	1.8	3.6	15°	0.5
CG04RS-10	★	●	Without	4	1	1.5	0.05	4	60	15	7	1.8	3.6	15°	0.5
CG04RS-10B	★	★	With	4	1	1.5	0.05	4	60	15	7	1.8	3.6	15°	0.5
CG04RS-20	★	★	Without	4	2	1.5	0.1	4	60	16	7	1.8	3.6	15°	0.5
CG04RS-20B	★	●	With	4	2	1.5	0.1	4	60	16	7	1.8	3.6	15°	0.5
CG0510RS-10	★	●	Without	5	1	2	0.05	5	70	10	8	2.3	4.5	15°	0.7
CG0510RS-10B	★	●	With	5	1	2	0.05	5	70	10	8	2.3	4.5	15°	0.7
CG0511RS-20	★	●	Without	5	2	2	0.1	5	70	11	8	2.3	4.5	15°	0.7
CG0511RS-20B	★	★	With	5	2	2	0.1	5	70	11	8	2.3	4.5	15°	0.7
CG05RS-10	★	●	Without	5	1	2	0.05	5	70	20	8	2.3	4.5	15°	0.7
CG05RS-10B	★	★	With	5	1	2	0.05	5	70	20	8	2.3	4.5	15°	0.7
CG05RS-20	●	★	Without	5	2	2	0.1	5	70	21	8	2.3	4.5	15°	0.7
CG05RS-20B	★	●	With	5	2	2	0.1	5	70	21	8	2.3	4.5	15°	0.7
CG0610RS-10	★	●	Without	6	1	2	0.05	6	75	10	8	2.8	5.4	15°	0.7
CG0610RS-10B	★	●	With	6	1	2	0.05	6	75	10	8	2.8	5.4	15°	0.7
CG0611RS-20	★	●	Without	6	2	2	0.1	6	75	11	8	2.8	5.4	15°	0.7
CG0611RS-20B	★	●	With	6	2	2	0.1	6	75	11	8	2.8	5.4	15°	0.7
CG06RS-10	★	●	Without	6	1	2	0.05	6	75	20	8	2.8	5.4	15°	0.7
CG06RS-10B	●	●	With	6	1	2	0.05	6	75	20	8	2.8	5.4	15°	0.7
CG06RS-20	★	●	Without	6	2	2	0.1	6	75	21	8	2.8	5.4	15°	0.7
CG06RS-20B	●	●	With	6	2	2	0.1	6	75	21	8	2.8	5.4	15°	0.7
CG0712RS-10	★	●	Without	7	1	2	0.05	7	85	12	8	3.3	6.4	15°	0.7
CG0712RS-10B	★	●	With	7	1	2	0.05	7	85	12	8	3.3	6.4	15°	0.7
CG0713RS-20	★	★	Without	7	2	2	0.1	7	85	13	8	3.3	6.4	15°	0.7
CG0713RS-20B	★	★	With	7	2	2	0.1	7	85	13	8	3.3	6.4	15°	0.7
CG07RS-10	★	★	Without	7	1	2	0.05	7	85	25	8	3.3	6.4	15°	0.7
CG07RS-10B	★	●	With	7	1	2	0.05	7	85	25	8	3.3	6.4	15°	0.7
CG07RS-20	★	●	Without	7	2	2	0.1	7	85	26	8	3.3	6.4	15°	0.7
CG07RS-20B	●	●	With	7	2	2	0.1	7	85	26	8	3.3	6.4	15°	0.7

GROOVING / CUTTING OFF

# MICRO-MINI TWIN

## RECOMMENDED CUTTING CONDITIONS

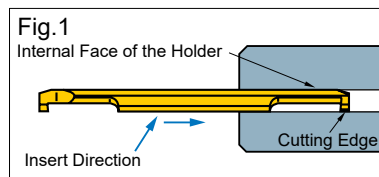
Work Material	Hardness	Cutting Speed (m/min)	Feed (mm/rev)		Recommended Tool Overhang (mm)
			CG03RS/CG04RS	CG05RS/CG06RS/CG07RS	
<b>P</b> Carbon Steel · Alloy Steel	180–280HB	80 (40–120)	0.02 (0.01–0.03)	0.03 (0.01–0.05)	
<b>M</b> Stainless Steel	≤200HB	80 (40–120)	0.02 (0.01–0.03)	0.03 (0.01–0.05)	
<b>K</b> Gray Cast Iron	Tensile Strength ≤350MPa	80 (40–120)	0.03 (0.01–0.05)	0.03 (0.01–0.05)	
<b>N</b> Non-ferrous Metal	—	120 (80–160)	0.03 (0.01–0.05)	0.05 (0.01–0.08)	

Note 1) Wet cutting is recommended.

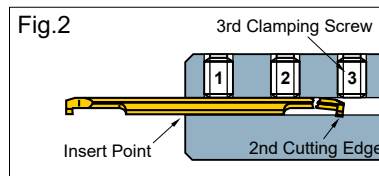
## PRECAUTIONS WHEN USING THE MICRO-MINI TWIN

● When using a holder for general purpose / small automatic lathe:

① To avoid chipping of the 2nd cutting edge take care when inserting the boring bar into the holder. Refer to fig.1. If the 2nd edge contacts the internal face of the holder there is a possibility that it may chip.



② When using this type of holder, there is a possibility that damage to the shank and the 2nd cutting edge can occur. Make sure that the clamping screws are tightened to the set torque value. Additionally make sure that there is no clamping screw near the 2nd cutting edge as this can break the boring bar.

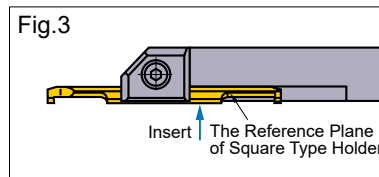


◎ When using Mitsubishi holders

When using holders with a tool overhang of recommended quantity, ensure that the 3rd clamping screw is removed prior to machining. The set torque value for the clamping screw is 2.0 N·m.

● When using a square type holder:

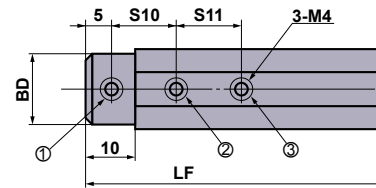
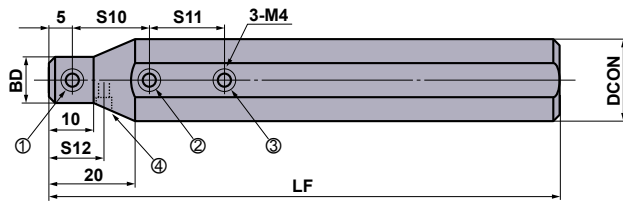
① When installing the boring bar into the holder, tighten the clamp screws after ensuring the flats on the tool holder are parallel to the reference flats on the micro-mini bar. Refer to fig.3.



② Make sure that the clamping screws are tightened to the recommended values.

③ Do not tighten the clamp screw without a bar in place, otherwise the bridge will be deformed.

# ROUND TYPE HOLDER



RBH2200N has a temporary set screw for different machine specifications.  
(Represented by number 4)

RBH15800N, RBH1600N,  
RBH19000N

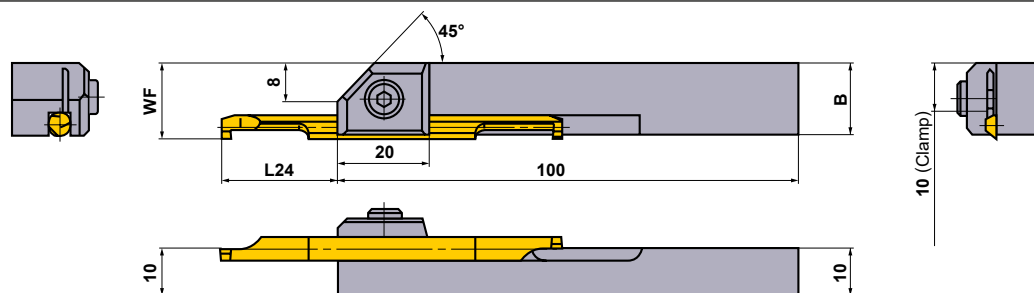
Order Number	Stock	Dimensions (mm)							MICRO-MINI C	MICRO-MINI TWIN CG	*1 Clamp Screw				Wrench	Torque (N·m)
		DCON	DCONWS	BD	LF	S10	S11	S12			①	②	③	④		
RBH15820N	★	15.875	2	15	100	10	—	—	—	B	B	—	—	HKY20F	2.0	
RBH15830N	★	15.875	3	15	100	10	10	—	03FR-BLS	A	A	A	—	HKY20F	2.0	
RBH15840N	★	15.875	4	15	100	15	15	—	04FR-BLS	A	A	A	—	HKY20F	2.0	
RBH15850N	★	15.875	5	15	100	15	15	—	05HR-BLS	A	A	A	—	HKY20F	2.0	
RBH15860N	★	15.875	6	15	100	15	15	—	—	A	A	A	—	HKY20F	2.0	
RBH15870N	★	15.875	7	15	100	20	20	—	—	A	A	A	—	HKY20F	2.0	
RBH15880N	★	15.875	8	15	100	20	20	—	—	D	D	D	—	HKY20F	2.0	
RBH1620N	●	16	2	15	100	10	—	—	—	B	B	—	—	HKY20F	2.0	
RBH1630N	●	16	3	15	100	10	10	—	03FR-BLS	A	A	A	—	HKY20F	2.0	
RBH1640N	●	16	4	15	100	15	15	—	04FR-BLS	A	A	A	—	HKY20F	2.0	
RBH1650N	●	16	5	15	100	15	15	—	05HR-BLS	A	A	A	—	HKY20F	2.0	
RBH1660N	●	16	6	15	100	15	15	—	—	A	A	A	—	HKY20F	2.0	
RBH1670N	●	16	7	15	100	20	20	—	—	A	A	A	—	HKY20F	2.0	
RBH1680N	★	16	8	15	100	20	20	—	—	D	D	D	—	HKY20F	2.0	
RBH19020N	★	19.05	2	18	125	10	—	—	—	C	C	—	—	HKY20F	2.0	
RBH19030N	★	19.05	3	18	125	10	10	—	03FR-BLS	B	B	B	—	HKY20F	2.0	
RBH19040N	★	19.05	4	18	125	15	15	—	04FR-BLS	B	B	B	—	HKY20F	2.0	
RBH19050N	★	19.05	5	18	125	15	15	—	05HR-BLS	B	B	B	—	HKY20F	2.0	
RBH19060N	★	19.05	6	18	125	15	15	—	—	B	B	B	—	HKY20F	2.0	
RBH19070N	★	19.05	7	18	125	20	20	—	—	B	B	B	—	HKY20F	2.0	
RBH19080N	★	19.05	8	18	125	20	20	—	—	A	A	A	—	HKY20F	2.0	
RBH2020N	★	20	2	11	125	10	—	—	—	A	A	—	—	HKY20F	2.0	
RBH2030N	★	20	3	12	125	10	10	—	03FR-BLS	A	A	B	—	HKY20F	2.0	
RBH2040N	★	20	4	13	125	15	15	—	04FR-BLS	A	B	B	—	HKY20F	2.0	
RBH2050N	★	20	5	14	125	15	15	—	05HR-BLS	A	B	B	—	HKY20F	2.0	
RBH2060N	★	20	6	15	125	15	15	—	—	A	B	B	—	HKY20F	2.0	
RBH2070N	★	20	7	16	125	20	20	—	—	A	B	B	—	HKY20F	2.0	
RBH2080N	★	20	8	17	125	20	20	—	—	A	A	A	—	HKY20F	2.0	
RBH2220N	★	22	2	11	125	10	—	10	—	A	B	—	A	HKY20F	2.0	
RBH2230N	★	22	3	12	125	10	10	10	03FR-BLS	A	B	C	A	HKY20F	2.0	
RBH2240N	★	22	4	13	125	15	15	12.5	04FR-BLS	A	B	B	A	HKY20F	2.0	
RBH2250N	★	22	5	14	125	15	15	12.5	05HR-BLS	A	B	B	A	HKY20F	2.0	
RBH2260N	★	22	6	15	125	15	15	15	—	A	B	B	A	HKY20F	2.0	
RBH2270N	★	22	7	16	125	20	20	15	—	A	B	B	A	HKY20F	2.0	
RBH2280N	★	22	8	17	125	20	20	15	—	A	B	B	A	HKY20F	2.0	
RBH2520N	★	25	2	11	150	10	—	—	—	A	B	—	—	HKY20F	2.0	
RBH2530N	★	25	3	12	150	10	10	—	03FR-BLS	A	B	C	—	HKY20F	2.0	
RBH2540N	★	25	4	13	150	15	15	—	04FR-BLS	A	C	C	—	HKY20F	2.0	
RBH2550N	★	25	5	14	150	15	15	—	05HR-BLS	A	C	C	—	HKY20F	2.0	
RBH2560N	★	25	6	15	150	15	15	—	—	A	C	C	—	HKY20F	2.0	
RBH2570N	★	25	7	16	150	20	20	—	—	A	C	C	—	HKY20F	2.0	
RBH2580N	★	25	8	17	150	20	20	—	—	A	B	B	—	HKY20F	2.0	
RBH25420N	★	25.4	2	11	150	10	—	—	—	A	B	—	—	HKY20F	2.0	
RBH25430N	★	25.4	3	12	150	10	10	—	03FR-BLS	A	B	C	—	HKY20F	2.0	
RBH25440N	★	25.4	4	13	150	15	15	—	04FR-BLS	A	C	C	—	HKY20F	2.0	
RBH25450N	★	25.4	5	14	150	15	15	—	05HR-BLS	A	C	C	—	HKY20F	2.0	
RBH25460N	★	25.4	6	15	150	15	15	—	—	A	C	C	—	HKY20F	2.0	
RBH25470N	★	25.4	7	16	150	20	20	—	—	A	C	C	—	HKY20F	2.0	
RBH25480N	★	25.4	8	17	150	20	20	—	—	A	B	B	—	HKY20F	2.0	

\*1 Order number of clamp screw A=HSS04004, B=HSS04006, C=HSS04008

F

GROOVING / CUTTING OFF

## SQUARE TYPE HOLDER



Order Number	Stock	Dimensions (mm)				MICRO-MINI TWIN CG	Clamp Screw	Wrench	Torque (N · m)
		MICRO-MINI TWIN CG							
		B	WF	L24 *					
		Width of Cutting Edge 1mm	Width of Cutting Edge 2mm						
<b>SBH1030R</b>	★	13.8	13.8	13—17.5 (14)	14—16.5 (15)	03RS-10(B),03RS-20(B)	HSC05012	HKY40R	9.5
<b>SBH1040R</b>	★	14.7	14.8	18—22.5 (19)	19—21.5 (20)	04RS-10(B),04RS-20(B)	HSC05012	HKY40R	9.5
<b>SBH1050R</b>	★	15.6	15.8	23—27.5 (24)	24—26.5 (25)	05RS-10(B),05RS-20(B)	HSC05012	HKY40R	9.5
<b>SBH1060R</b>	★	16.5	16.8	23—32.5 (24)	24—31.5 (25)	06RS-10(B),06RS-20(B)	HSC05012	HKY40R	9.5
<b>SBH1070R</b>	★	17.4	17.8	28—38 (29)	29—37 (30)	07RS-10(B),07RS-20(B)	HSC05012	HKY40R	9.5

\* L24 is the length of overhang for sufficient clamping, and ( ) is the recommended length for steel machining and for general purpose.  
 Note 1) The MICRO-DEX and the MICRO-MINI cannot be fitted to square holders.

F

GROOVING / CUTTING OFF

# Memo

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A series of horizontal dashed lines for writing, spanning the width of the page.

# HOW TO READ THE STANDARD OF THREADING TOOLS

## ● How this section page is organised

- ① Classified according to external or internal applications.
- ② Sub-classified according to product series.  
(Refer to the index on the next page.)

**FIGURE SHOWING THE TOOLING APPLICATION**  
Uses illustrations and arrows to depict the available machining applications, such as external and internal threading.

**TYPE OF TOOL HOLDER**  
Indicates the initial letters for the order number and cutting applications.

**TITLE OF PRODUCT**      **INDICATION OF EXTERNAL/INTERNAL APPLICATION**

**PRODUCT SECTION**      **PRODUCT FEATURES**

**STANDARDS FOR APPLICABLE INSERTS**  
Indicates stock status, dimensions, etc. for applicable inserts.

**INTERNAL THREADING**  
**MMTI TYPE BORING BARS**  
Minimum cutting diameter: 13mm.  
Various insert types.  
Hollow design insert.  
Available with a wiper cutting edge to provide a precise thread geometry.  
Able to change lead angle by replacing shim.

Order Number	Insert Number	Dimensions (mm)				SHIM	Tool Holder	Applicable				
		DCOM	LF	LORES	WF							
MMTR1516AK11-SP14	MMT11R	1.5	18	125	25	8.7	15	13	TS2	Right hand tool holder only	①	②
MMTR1516AK11-SP25	MMT11R	2.5	18	125	25	8.7	15	13	TS2	Right hand tool holder only	①	②
MMTR1516AK11-SP35	MMT11R	3.5	18	125	25	8.7	15	13	TS2	Right hand tool holder only	①	②
MMTR1516AM11-SP15	MMT11R	1.5	18	150	32	9.7	15	15	TS2	Right hand tool holder only	①	②
MMTR1516AM11-SP25	MMT11R	2.5	18	150	32	9.7	15	15	TS2	Right hand tool holder only	①	②
MMTR1516AM11-SP35	MMT11R	3.5	18	150	32	9.7	15	15	TS2	Right hand tool holder only	①	②
MMTR1916AM16-SP15	MMT16R	1.5	18	150	40	12.2	15	19	CS30860T	Right hand tool holder only	①	②
MMTR1916AM16-SP25	MMT16R	2.5	18	150	40	12.2	15	19	CS30860T	Right hand tool holder only	①	②
MMTR1916AM16-SP35	MMT16R	3.5	18	150	40	12.2	15	19	CS30860T	Right hand tool holder only	①	②
MMTR2420AQ16-C	MMT22R	1.5	20	180	40	14.2	19	24	SETN51	Right hand tool holder only	①	②
MMTR2925AS16-C	MMT22R	1.5	25	200	60	16.7	23.4	29	SETN51	Right hand tool holder only	①	②
MMTR3232AP16-C	MMT22R	1.5	32	250	48	20.0	30.0	37	SETN51	Right hand tool holder only	①	②
MMTR4240AQ22-SP15	MMT22R	1.5	20	180	50	15.5	19	24	TS43	Right hand tool holder only	①	②
MMTR4240AQ22-SP25	MMT22R	2.5	20	180	50	15.5	19	24	TS43	Right hand tool holder only	①	②
MMTR4240AQ22-SP35	MMT22R	3.5	20	180	50	15.5	19	24	TS43	Right hand tool holder only	①	②
MMTR3925AR22-C	MMT22R	1.5	25	200	38	17.8	23.4	30	SETN51	Right hand tool holder only	①	②
MMTR3925AR22-C	MMT22R	1.5	32	250	48	21.8	30.4	38	SETN51	Right hand tool holder only	①	②
MMTR4640AZ2-C	MMT22R	1.5	40	300	60	26.5	38	48	SETN51	Right hand tool holder only	①	②

Note 1) Select and use a shim as shown below (bold separately), depending on the lead angle.

\* A screw on tool holder uses no shim. (The holder body has a lead angle.) Use a tool holder with the appropriate lead angle.

\* Min. cutting diameter (DCOM) shows the internal hole diameter, not the thread diameter.

\* Clamp Torque (N·m): TS25=1.0, CS30860T=3.5, SET51=3.5, TS43=3.5, SET51=5.0, HFC03006=1.5, HFC04008=2.2

Lead Angle (°)	Order Number	Shim (mm)	Applicable Holder	Lead Angle (°)	Order Number	Shim (mm)	Applicable Holder
-1.5	CT132TN15	0	MMT11R	-1.5	CT143TN15	0	MMT11R
-0.5	CT132TN15	0	MMT11R	-0.5	CT143TN15	0	MMT11R
0.5	CT132TP15	0	MMT11R	0.5	CT143TP15	0	MMT11R
1.5	CT132TP15	0	MMT11R	1.5	CT143TP15	0	MMT11R
2.5	CT132TP25	1	CT16-C	2.5	CT143TP25	1	CT16-C
3.5	CT132TP35	2	CT16-C	3.5	CT143TP35	2	CT16-C
4.5	CT132TP45	3	CT16-C	4.5	CT143TP45	3	CT16-C

**RECOMMENDED CUTTING CONDITIONS**

Work Material	Hardness	Grade	Cutting Speed (m/min)	Work Material	Hardness	Grade	Cutting Speed (m/min)
Mild Steel	≤180HB	VP16MP	150 (100-200)	Heat-Resistant Alloy	—	VP16SPT	45 (15-30)
Carbon Steel Alloy Steel	180-280HB	VP16MP	140 (100-200)	Titanium Alloy	—	VP16SPT	60 (40-80)
Stainless Steel	≤200HB	VP16SPT	80 (50-100)	Heat-Treated Alloy	45-55HRC	VP16SPT	50 (30-70)
Gray Cast Iron	—	VP16SPT	80 (40-100)				

● Inventory maintained. \* Inventory maintained in Japan.  
(# Inserts in one case)

HOW TO SELECT A SHIM  
MMT SERIES ORDER NUMBER → G012  
SHIM SERIES ORDER NUMBER → G016

## MMT M-CLASS INSERTS WITH 3-D CHIP BREAKERS

Type	Order Number	Pitch	Dimensions (mm)				Total Cutting Depth (mm)	Geometry	
			mm	mm	mm	mm			
Partial Profile ISO	MMT11RA60-S	0.5-1.5	48-16	6.35	3.04	0.8	0.9	0.03	Partial form
	MMT16RA60-S	0.5-1.5	48-16	9.525	3.44	0.8	0.9	0.03	Partial form
	MMT16RG60-S	1.75-3.0	14-B	9.525	3.44	1.2	1.7	0.11	Partial form
Partial Profile SP	MMT11RA55-S	—	48-16	6.35	3.04	0.8	0.9	0.07	Partial form
	MMT16RA55-S	—	48-16	9.525	3.44	0.8	0.9	0.07	Partial form
	MMT16RG55-S	—	14-B	9.525	3.44	1.2	1.7	0.21	Partial form
ISO Metric	MMT11R100ISO-S	1.0	—	6.35	3.04	0.6	0.7	0.06	Full form
	MMT11R125ISO-S	1.25	—	6.35	3.04	0.8	0.9	0.08	Full form
	MMT11R150ISO-S	1.5	—	6.35	3.04	0.8	1.0	0.10	Full form
	MMT16R100ISO-S	1.0	—	9.525	3.44	0.6	0.7	0.06	Full form
	MMT16R125ISO-S	1.25	—	9.525	3.44	0.8	0.9	0.08	Full form
	MMT16R150ISO-S	1.5	—	9.525	3.44	0.8	1.0	0.10	Full form
	MMT16R175ISO-S	1.75	—	9.525	3.44	0.9	1.2	0.11	Full form
	MMT16R200ISO-S	2.0	—	9.525	3.44	1.0	1.3	0.13	Full form
	MMT16R250ISO-S	2.5	—	9.525	3.44	1.1	1.5	0.17	Full form
	MMT16R300ISO-S	3.0	—	9.525	3.44	1.1	1.5	0.20	Full form
American UN	MMT16R160UN-S	—	16	9.525	3.44	0.9	1.1	0.11	Full form
	MMT16R140UN-S	—	14	9.525	3.44	0.9	1.2	0.12	Full form
	MMT16R120UN-S	—	12	9.525	3.44	1.1	1.4	0.14	Full form
American UN	MMT16R100W-S	—	19	9.525	3.44	0.8	1.0	0.18	Full form
	MMT16R140W-S	—	14	9.525	3.44	1.0	1.2	0.25	Full form
	MMT16R110W-S	—	11	9.525	3.44	1.1	1.5	0.32	Full form
BSPT	MMT16R190BSPT-S	—	19	9.525	3.44	0.8	0.9	0.18	Full form
	MMT16R140BSPT-S	—	14	9.525	3.44	1.0	1.2	0.25	Full form
	MMT16R110BSPT-S	—	11	9.525	3.44	1.1	1.5	0.32	Full form

**IDENTIFICATION**

MMT 16 I R 100 ISO - S

Designation: MMT 16 I R 100 ISO - S

Hand of Tool: R (Right)

Application: I (Internal)

Pitch: 1.0 mm

Threading Type: S (Metric)

Standard of Depth of Cut: G016

Spare Parts: N001

Technical Data: P001

**LEGEND FOR STOCK STATUS MARK**  
Is shown on the left hand page of each double-page spread.

**PRODUCT STANDARDS**  
Indicates order numbers, stock status (per right/left hand), applicable inserts, holder dimensions, and spare parts.

**PAGE REFERENCE**  
· SPARE PARTS  
Indicates reference pages, including the above, on the right hand page of each double-page spread.

**RECOMMENDED CUTTING CONDITIONS**  
For each work material classification, indicates recommended cutting conditions according to the ISO categories for cutting grades, P, M, K, S and H.



# TURNING TOOLS

# THREADING

CLASSIFICATION (EXTERNAL).....	G002
CLASSIFICATION (INTERNAL).....	G003
CROSS REFERENCE THREAD PITCH	
EXTERNAL .....	G004
INTERNAL .....	G006
STANDARD THREAD AND CORRESPONDING INSERT / HOLDER .....	G008

## STANDARD OF THREADING TOOLS

### MMT SERIES

FEATURES .....	G010
CUTTING CONDITIONS.....	G012
STANDARD OF DEPTH OF CUT.....	G014

### EXTERNAL THREADING

MMTE HOLDER .....	G019
MT HOLDER .....	G024

### INTERNAL THREADING

MMTI TYPE BORING BARS.....	G026
MICRO-MINI TWIN BORING BARS .....	G031

\*Alphabetical order index

G031	CT
G020	MMT (EXTERNAL INSERTS)
G027	MMT (INTERNAL INSERTS)
G019	MMTE
G026	MMTI
G024	MT1
G024	MTH
G025	MTT (EXTERNAL INSERTS)
G033	RBH
G032	SBH



# CLASSIFICATION (EXTERNAL)

Name of Tool Holder	Insert Shape	Features	Shank Size (H x W x L) (mm)
<b>MMTE Holder</b>   		<ul style="list-style-type: none"> <li>● Various insert types.</li> <li>● Precision class insert.</li> <li>● Available with a wiper cutting edge to provide a precise thread geometry.</li> <li>● Able to change lead angle by replacing the shim.</li> </ul>	12 x 12 x 100 16 x 16 x 100 20 x 20 x 125 25 x 25 x 150 32 x 32 x 170
<b>MT Holder</b>   		<ul style="list-style-type: none"> <li>● Clamp-on type.</li> <li>● Precision class insert.</li> <li>● Positive insert suffers from negligible chattering and thus produces a good finished surface.</li> </ul>	16 x 16 x 100 20 x 20 x 125 25 x 25 x 150 32 x 32 x 170
<b>SMALL TOOLS</b>	<b>TTAH</b>   	<ul style="list-style-type: none"> <li>● Tools to be used on gang type tool posts.</li> <li>● Small Shank : 8mm—16mm</li> <li>● High rigidity vertical insert design.</li> <li>● Screw is designed for use on both front and back to enable back clamping.</li> <li>● Most suitable for threading diameters of 2mm or smaller.</li> <li>● Screw-on type.</li> </ul>	8 x 10 x 120 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120
	<b>CSVH</b>   		<ul style="list-style-type: none"> <li>● Tools to be used on cam type tool posts.</li> <li>● Small Shank : 7mm—12mm</li> <li>● Single holder for front turning, back turning, grooving, threading and cutting off operations.</li> <li>● The most suitable for machining of small parts with diameter 5mm or less.</li> <li>● Screw-on type.</li> </ul>

**G**

THREADING

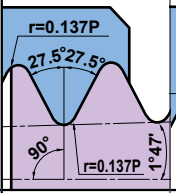
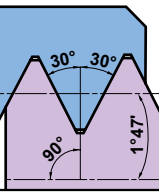
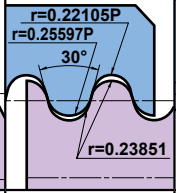
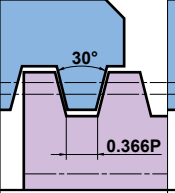
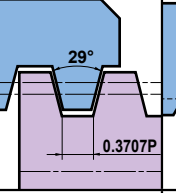
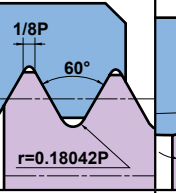
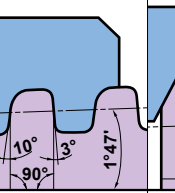
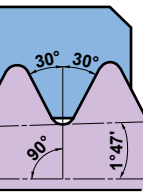
# CLASSIFICATION (INTERNAL)

Name of Tool Holder	Insert Shape	Features	Shank Size (Dia. x L x Min. Cutting Dia.) (mm)
<b>MMTI</b>  		<ul style="list-style-type: none"> <li>● Minimum cutting diameter 13mm.</li> <li>● Various insert types.</li> <li>● Precision class insert.</li> <li>● Available with a wiper cutting edge to provide a precise thread geometry.</li> <li>● Able to change lead angle by replacing shim.</li> </ul>	16 x 125 x 13 16 x 150 x 15 20 x 170 x 24 25 x 200 x 29 32 x 250 x 37 40 x 300 x 46
<b>MICRO-MINI TWIN Boring Bars</b>  	—	<ul style="list-style-type: none"> <li>● Minimum cutting diameter 3mm.</li> <li>● Solid carbide type.</li> <li>● Economical two cutting edges type.</li> </ul>	3 x 50 x 3 4 x 60 x 4.5 5 x 70 x 6 6 x 75 x 7
<b>MICRO-MINI Boring Bars</b>  	—	<ul style="list-style-type: none"> <li>● Minimum cutting diameter 3.2mm.</li> <li>● Solid carbide type.</li> <li>● Insert can be ground to suit the application.</li> </ul>	3 x 80 x 3.2 4 x 80 x 4.2 5 x 100 x 5.2



# CROSS REFERENCE THREAD PITCH (EXTERNAL)

Application		General machining				Pipe fittings and couplings for gas and water	
Type		Partial Profile 60°	Partial Profile 55°	ISO Metric	American UN	Parallel Pipe Thread Whitworth for BSW, BSP	American NPT
Symbol		M UNC UNF	W	M	UNC UNF	G(PF) Rp(PS) W	NPT
Pitch		mm (thread/inch)	thread/inch	mm	thread/inch	thread/inch	thread/inch
Holder							
<b>MMT Holder</b>  G019	Full form	—	—	0.5 – 5.0	32 – 5	28 – 5	27, 18, 14 11.5, 8
	Partial form	0.5 – 5.0 (48 – 5)	48 – 5	0.5 – 5.0	48 – 5	—	—
<b>MT Holder</b>  G024	Partial form	0.25 – 4.5 (64 – 6)	20 – 9	0.25 – 4.5	64 – 6	—	—

G  
 THREADING

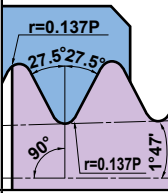
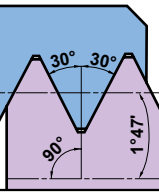
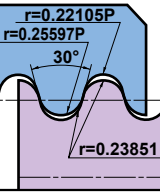
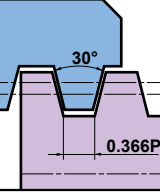
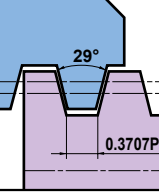
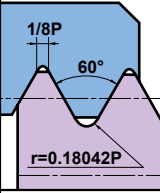
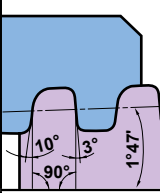
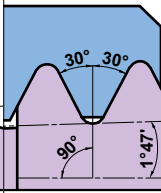
	Steam, gas and water pipes		Pipe couplings for food and fire fighting industries	Motion transmissions		Aircraft and aerospace	Oil and gas	
	Taper Pipe Thread BSPT	American NPTF	Round DIN 405	ISO Trapezoidal 30°	American ACME	UNJ	API Buttress Casing	API Round Casing&Tubing
								
	R(PT) Rc(PT) Rp	NPTF	Rd	Tr (TM)	ACME (Tw)	UNJ	BCSG	CSG LCSG
	thread/inch	thread/inch	thread/inch	mm	thread/inch	thread/inch	thread/inch	thread/inch
	28, 19 14, 11	27, 18, 14 11.5, 8	10, 8, 6, 4	1.5, 2 3, 4, 5	12, 10 8, 6, 5	32–8	5	10, 8
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–

# CROSS REFERENCE THREAD PITCH (INTERNAL)

Application		General machining				Pipe fittings and couplings for gas and water	
Type		Partial Profile 60°	Partial Profile 55°	ISO Metric	American UN	Parallel Pipe Thread Whitworth for BSW, BSP	American NPT
Symbol		M UNC UNF	W	M	UNC UNF	G(PF) Rp(PS) W	NPT
Pitch		mm (thread/inch)	thread/inch	mm	thread/inch	thread/inch	thread/inch
Holder							
<b>MMT</b> Boring Bar  ↻ G026	Full form	—	—	0.5 – 5.0	32 – 5	28 – 5	27, 18, 14 11.5, 8
	Partial form	0.5 – 5.0 (48 – 5)	48 – 5	0.5 – 5.0	48 – 5	—	—
<b>MICRO-MINI TWIN</b>  ↻ G031	Partial form	0.5 – 1.75 (36 – 16)	—	0.5 – 1.75	36 – 16	—	—



THREADING

	Steam, gas and water pipes		Pipe couplings for food and fire fighting industries	Motion transmissions		Aircraft and aerospace	Oil and gas	
	Taper Pipe Thread BSPT	American NPTF	Round DIN 405	ISO Trapezoidal 30°	American ACME	UNJ	API Buttress Casing	API Round Casing&Tubing
								
	R(PT) Rc(PT) Rp	NPTF	Rd	Tr (TM)	ACME (Tw)	UNJ	BCSG	CSG LCSG
	thread/inch	thread/inch	thread/inch	mm	thread/inch	thread/inch	thread/inch	thread/inch
	19, 14, 11	14, 11.5, 8	10, 8 6, 4	1.5, 2 3, 4, 5	12, 10 8, 6, 5	—	5	10, 8
	—	—	—	—	—	*	—	—
	—	—	—	—	—	—	—	—

\* When machining an internal UNJ thread, cut an internal hole with the appropriate diameter. Then machine with 60° American UN. In this case, a full form type insert cannot be used.

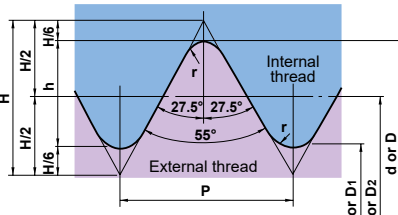
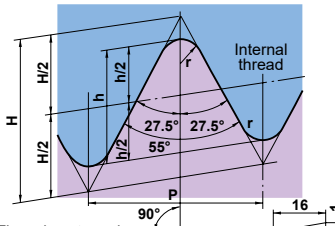
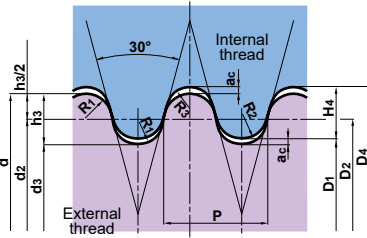
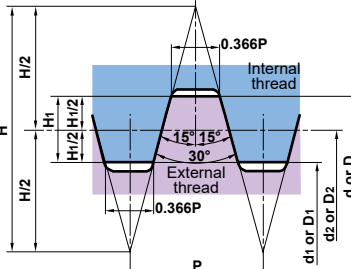
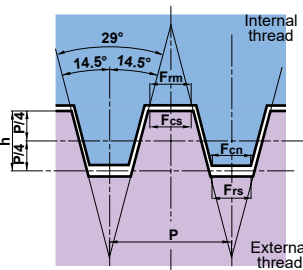
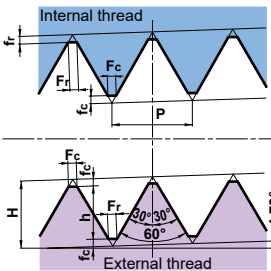
# STANDARD THREAD AND CORRESPONDING INSERT / HOLDER

Thread Name	Standard Thread Type	Type	Ext./Int.	Insert Number	Wiper/General	Tool Holder	Page		
ISO Metric	<p> <math>H=0.866025P</math> <math>d_2=d-0.649519P</math>  <math>H_1=0.541266P</math> <math>d_1=d-1.082532P</math>  <math>D=d</math> <math>D_2=d_2</math> <math>D_1=d_1</math> </p>	M	Ext.	MMT $\odot\odot$ ER $\odot\odot$ ISO	Wiper	MMTER $\odot\odot\odot\odot$ -C	G019		
				MMT $\odot\odot$ ER $\odot\odot$ ISO-S	Wiper				
				MMT $\odot\odot$ ER $\odot\odot$ 60	General				
				MMT $\odot\odot$ ER $\odot\odot$ 60-S	General				
		M	Int.	Ext.	MTTR/L4360 $\odot\odot$	General	MTHR/L $\odot\odot\odot\odot$ 4 MT1R/L $\odot\odot\odot\odot$ 4	G024	
					Int.	MMT $\odot\odot$ IR $\odot\odot$ ISO	Wiper	MMTIR $\odot\odot$ A $\odot\odot$ -SP $\odot$ MMTIR $\odot\odot$ A $\odot$ 16-C	G026
						MMT $\odot\odot$ IR $\odot\odot$ ISO-S	Wiper		
						MMT $\odot\odot$ IR $\odot\odot$ 60	General		
MMT $\odot\odot$ IR $\odot\odot$ 60-S	General								
American UN	<p> <math>H=0.866025 \times 25.4/n</math> <math>d_2=(d-0.649519/n) \times 25.4</math>  <math>H_1=0.541266 \times 25.4/n</math> <math>d_1=(d-1.082532/n) \times 25.4</math>  <math>d=(d) \times 25.4</math> <math>D=d</math> <math>D_2=d_2</math> <math>D_1=d_1</math> <math>P=25.4/\text{thread}</math> </p>	UNC UNF	Ext.	MMT $\odot\odot$ ER $\odot\odot$ UN	Wiper	MMTER $\odot\odot\odot\odot$ -C	G019		
				MMT $\odot\odot$ ER $\odot\odot$ UN-S	Wiper				
				MMT $\odot\odot$ ER $\odot\odot$ 60	General				
				MMT $\odot\odot$ ER $\odot\odot$ 60-S	General				
		UNC UNF	Int.	Ext.	MTTR/L4360 $\odot\odot$	General	MTHR/L $\odot\odot\odot\odot$ 4 MT1R/L $\odot\odot\odot\odot$ 4	G024	
					Int.	MMT $\odot\odot$ IR $\odot\odot$ UN	Wiper	MMTIR $\odot\odot$ A $\odot\odot$ -SP $\odot$ MMTIR $\odot\odot$ A $\odot$ 16-C	G026
						MMT $\odot\odot$ IR $\odot\odot$ UN-S	Wiper		
						MMT $\odot\odot$ IR $\odot\odot$ 60	General		
MMT $\odot\odot$ IR $\odot\odot$ 60-S	General								
Whitworth for BSW, BSP	<p> <math>H=0.9605P</math> <math>d_2=d-H_1</math> <math>d_1=d-2H_1</math> <math>r=0.1373P</math>  <math>H_1=0.6403P</math> <math>D_1=d_1+2 \times 0.0769H</math>  <math>D=d</math> <math>D_2=d_2</math> <math>D_1=d_1</math> <math>P=25.4/\text{thread}</math> </p>	W	Ext.	MMT $\odot\odot$ ER $\odot\odot$ W	Wiper	MMTER $\odot\odot\odot\odot$ -C	G019		
				MMT $\odot\odot$ ER $\odot\odot$ W-S	Wiper				
				MMT $\odot\odot$ ER $\odot\odot$ 55	General				
				MMT $\odot\odot$ ER $\odot\odot$ 55-S	General				
		W	Int.	Ext.	MTTR/L4355 $\odot\odot$	General	MTHR/L $\odot\odot\odot\odot$ 4 MT1R/L $\odot\odot\odot\odot$ 4	G024	
					Int.	MMT $\odot\odot$ IR $\odot\odot$ W	Wiper	MMTIR $\odot\odot$ A $\odot\odot$ -SP $\odot$ MMTIR $\odot\odot$ A $\odot$ 16-C	G026
						MMT $\odot\odot$ IR $\odot\odot$ W-S	Wiper		
						MMT $\odot\odot$ IR $\odot\odot$ 55	General		
MMT $\odot\odot$ IR $\odot\odot$ 55-S	General								

Wiper : Insert order number is determined by the selected pitch.

General : An insert is applicable to several pitch types.



Thread Name	Standard Thread Type	Type	Ext./Int.	Insert Number	Wiper/General	Tool Holder	Page
Parallel Pipe Thread	 <p>H=0.960491P d<sub>2</sub>=d-h d<sub>1</sub>=d-2h r=0.137329P h=0.640327 D=d D<sub>2</sub>=d<sub>2</sub> D<sub>1</sub>=d<sub>1</sub> 25.4/ thread</p>	PF G Rp	Ext.	MMT $\odot\odot$ ER $\odot\odot\odot$ W	Wiper	MMTER $\odot\odot\odot\odot\odot\odot$ -C	G019
				MMT $\odot\odot$ ER $\odot\odot\odot$ W-S	Wiper		
			Int.	MMT $\odot\odot$ IR $\odot\odot\odot$ W	Wiper	MMTIR $\odot\odot$ A $\odot\odot\odot$ -SP $\odot$ MMTIR $\odot\odot$ A $\odot\odot$ 16-C	G026
				MMT $\odot\odot$ IR $\odot\odot\odot$ W-S	Wiper		
BSPT	 <p>H=0.960237P h=0.640327 r=0.137278P P=25.4/ thread</p>	BSPT	Ext.	MMT $\odot\odot$ ER $\odot\odot\odot$ BSPT	Wiper	MMTER $\odot\odot\odot\odot\odot\odot$ -C	G019
				MMT $\odot\odot$ ER $\odot\odot\odot$ BSPT-S	Wiper		
			Int.	MMT $\odot\odot$ IR $\odot\odot\odot$ BSPT	Wiper	MMTIR $\odot\odot$ A $\odot\odot\odot$ -SP $\odot$ MMTIR $\odot\odot$ A $\odot\odot$ 16-C	G026
				MMT $\odot\odot$ IR $\odot\odot\odot$ BSPT-S	Wiper		
Round DIN 405	 <p>a<sub>c</sub>=0.05×P h<sub>3</sub>=H<sub>4</sub>=0.5×P R<sub>1</sub>=0.238507×P R<sub>2</sub>=0.255967×P R<sub>3</sub>=0.221047×P</p>	Rd	Ext.	MMT $\odot\odot$ ER $\odot\odot\odot$ RD	Wiper	MMTER $\odot\odot\odot\odot\odot\odot$ -C	G019
			Int.	MMT $\odot\odot$ IR $\odot\odot\odot$ RD	Wiper	MMTIR $\odot\odot$ A $\odot\odot\odot$ -SP $\odot$ MMTIR $\odot\odot$ A $\odot\odot$ 16-C	G026
ISO Trapezoidal 30°		Tr	Ext.	MMT $\odot\odot$ ER $\odot\odot\odot$ TR	Wiper	MMTER $\odot\odot\odot\odot\odot\odot$ -C	G019
			Int.	MMT $\odot\odot$ IR $\odot\odot\odot$ TR	Wiper	MMTIR $\odot\odot$ A $\odot\odot\odot$ -SP $\odot$ MMTIR $\odot\odot$ A $\odot\odot$ 16-C	G026
American ACME		ACME	Ext.	MMT $\odot\odot$ ER $\odot\odot\odot$ ACME	Wiper	MMTER $\odot\odot\odot\odot\odot\odot$ -C	G019
			Int.	MMT $\odot\odot$ IR $\odot\odot\odot$ TACME	Wiper	MMTIR $\odot\odot$ A $\odot\odot\odot$ -SP $\odot$ MMTIR $\odot\odot$ A $\odot\odot$ 16-C	G026
American NPT	 <p>H=0.866025P h=0.800000p</p>	NPT	Ext.	MMT $\odot\odot$ ER $\odot\odot\odot$ NPT	Wiper	MMTER $\odot\odot\odot\odot\odot\odot$ -C	G019
			Int.	MMT $\odot\odot$ IR $\odot\odot\odot$ NPT	Wiper	MMTIR $\odot\odot$ A $\odot\odot\odot$ -SP $\odot$ MMTIR $\odot\odot$ A $\odot\odot$ 16-C	G026


Wiper : Insert order number is determined by the selected pitch.  
General : An insert is applicable to several pitch types.

# FEATURES OF MMT SERIES

## ■ A WIDE VARIETY OF PRODUCTS

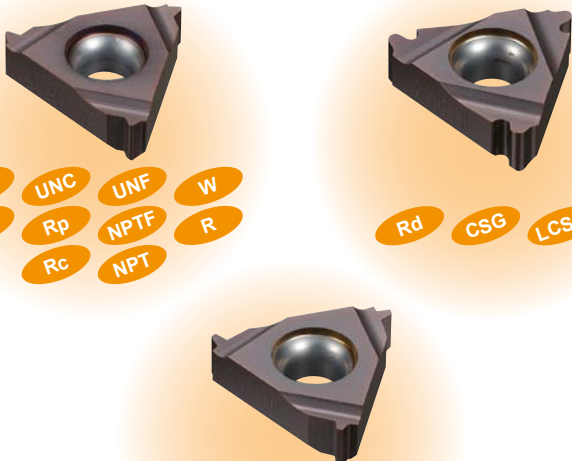
Mitsubishi Miracle Threading (MMT) series.

**M-CLASS INSERTS WITH 3-D CHIPBREAKERS**



M UNC UNF W  
G Rp R Rc

**G-CLASS GROUND INSERTS**

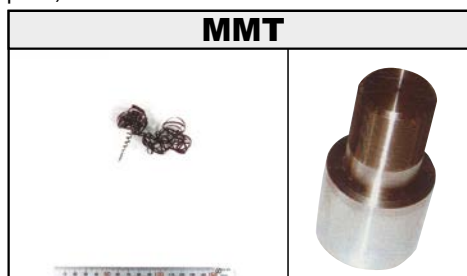
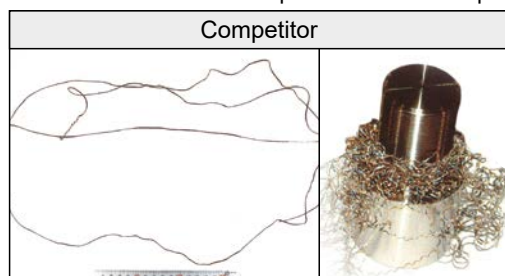


M UNC UNF W  
G Rp NPTF R  
Rc NPT  
Rd CSG LCSG  
Tr ACME BCSG

THREADING

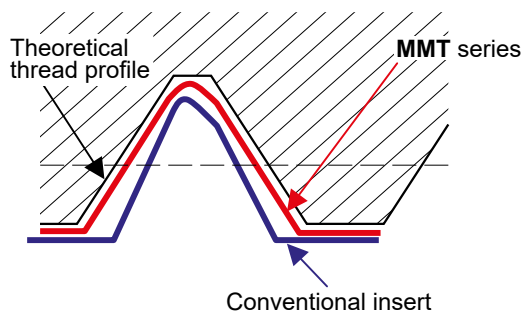
## ■ IDEAL CHIP CONTROL EVEN DURING THE LATTER HALF OF PASSES WHEN CONTINUOUS CHIPS ARE USUALLY PRODUCED. (M-CLASS INSERTS WITH 3-D CHIPBREAKERS)

ISO metric external thread pitch 1.5mm Final pass (6th pass)



<Cutting Conditions>  
 Workpiece : DIN 41CrMo4  
 Insert : MMT16ER150ISO-S  
 Grade : VP15TF  
 Cutting speed : 120m/min  
 Cutting method : Radial Infeed  
 Depth of cut : Fixed cut area  
 Pass : 6 times  
 Coolant : Wet

## ■ A HIGHER LEVEL OF PRECISION THAN CONVENTIONAL INSERTS (G-CLASS GROUND INSERTS)

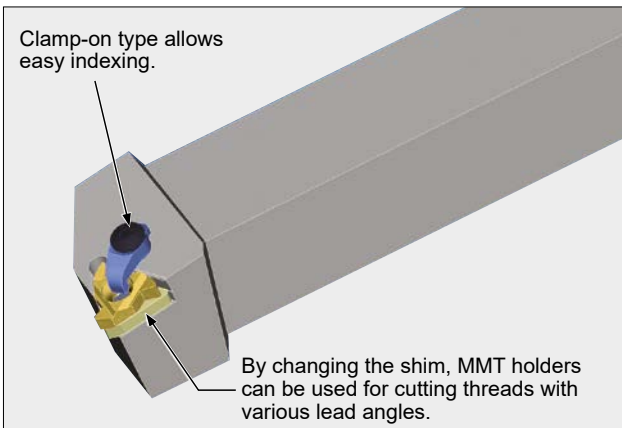


High precision threading can be achieved by using MMT inserts that feature a ground rake faces and peripheral cutting edges.

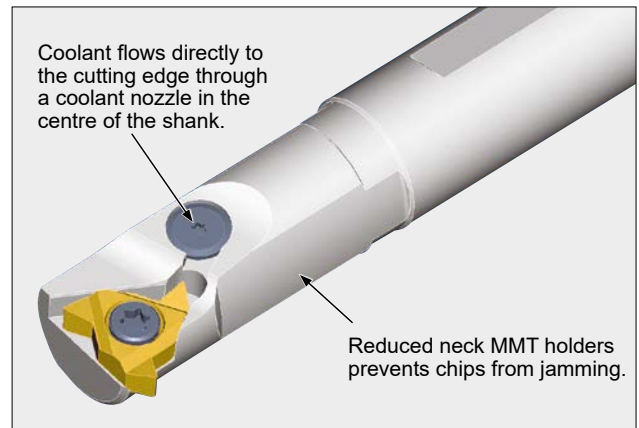
Thread Type	Threading Tolerance
ISO Metric	6g / 6H
American UN	2A / 2B
Whitworth for BSW, BSP	Medium Class A
BSPT	Standard BSPT
Round DIN 405	7h / 7H
ISO Trapezoidal 30°	7e / 7H
American ACME	3G
UNJ	3A
API Buttress Casing	Standard API
API Rounded Casing & Tubing	Standard API RD
American NPT	Standard NPT
American NPTF	Class2

## ■ HOLDER (Use of special surface treatment)

### External

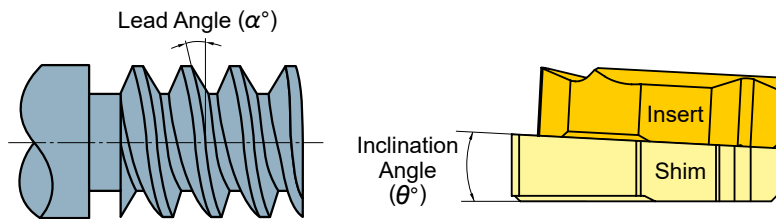


### Internal



\* Order number of coolant guide screw: TFS03006 (Except MMTIR1316/MMTIR1516)

## ■ SUITABLE FOR THREADING WITH A LARGE LEAD ANGLE



By changing only the shim, MMT holders can be used for turning of threads with various lead angles as well as the turning of left hand threads.

Lead Angle ( $\alpha^\circ$ )	Inclination Angle ( $\theta^\circ$ )
-1.5°	-3°
-0.5°	-2°
0.5°	-1°
1.5°	0°
2.5°	1°
3.5°	2°
4.5°	3°

□ Standard shim delivered with the holder.

## ■ GRADE

### VP10MF (G-class ground inserts only)

#### ● Superior wear and plastic deformation resistance

- High wear and plastic deformation resistance for threading when maintaining the thread form is important. Suitable for continuous high precision machining with extensive tool life.
- Effective in combination with G-class inserts for high precision threading.

### VP15TF (G-class ground inserts, M-class inserts with 3-D chipbreakers)

#### ● Wide versatility


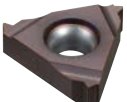
- High fracture resistance during low rigidity applications such as bar feed machining. Able to withstand harsh conditions for long periods where conventional inserts would be liable to breakage.
- Effective combination of high cost performance M-class inserts with 3-D chipbreakers.

### VP20RT (M-class inserts with 3-D chipbreakers)

#### ● Excellent fracture resistance

- Suitable for stainless steel boring and unstable machining where inserts are vulnerable to fracturing.
- Effective combination of high cost performance M-class inserts with 3-D chipbreakers.

## ■ CHOOSING M-CLASS INSERTS WITH 3-D CHIPBREAKERS OR G-CLASS INSERTS

Insert	Chip control	Precision of thread	Insert	Chip control	Precision of thread
M-class inserts with 3-D chipbreakers 	◎	○	G-class inserts 	○	◎

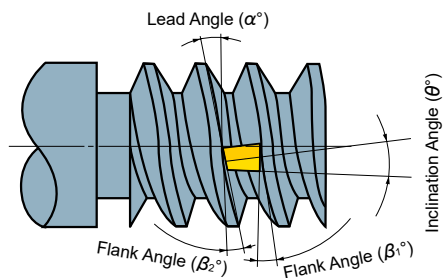
- For ideal chip control and a high cost performance ratio, M-class inserts with 3-D chipbreakers are recommended.
- G-class inserts are recommended where higher precision is required.

# CUTTING CONDITIONS OF MMT SERIES

## SELECTING A SHIM FOR THE MMT SERIES

### FLANK ANGLE AND LEAD ANGLE

Lead angle ( $\alpha$ ) depends on a combination of thread diameter and pitch. Select a shim so that the lead angle of the thread can coincide with the flank angles of the thread and insert ( $\beta_1, \beta_2$ ). No need to change a shim for general threading with an MMT holder. When threading with a small diameter or large pitch, change the shim depending on the lead angle, referring to the table and graph below. When threading left hand threads, change to a shim with a negative inclination angle.



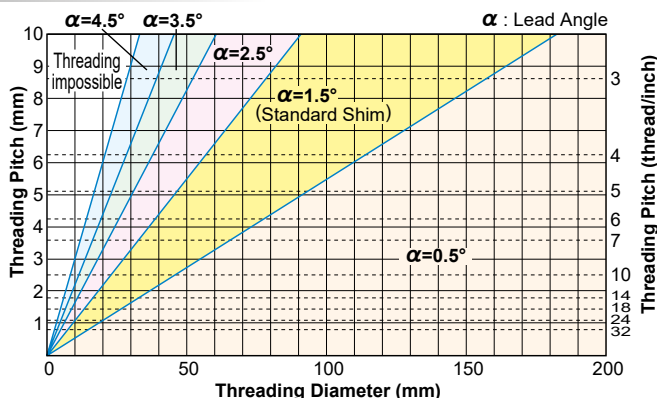
### SHIM REFERENCE TABLE (THREADING DIAMETER) (Thread angle 60° and 55°)

Lead Angle	Pitch (mm)	Right Hand Thread (mm)					Left Hand Thread (mm) *		
		Threading impossible	4.5°	3.5°	2.5°	1.5°	0.5°	Threading impossible	-1.5°
0.5	$\leq \phi 1.7$	$\phi 1.7 - \phi 2.3$	$\phi 2.3 - \phi 3.0$	$\phi 3.0 - \phi 4.6$	$\phi 4.6 - \phi 9.1$	$\geq \phi 9.1$	$\leq \phi 3.6$	$\phi 3.6 - \phi 9.1$	$\geq \phi 9.1$
0.75	$\leq \phi 2.5$	$\phi 2.5 - \phi 3.4$	$\phi 3.4 - \phi 4.6$	$\phi 4.6 - \phi 6.8$	$\phi 6.8 - \phi 13.7$	$\geq \phi 13.7$	$\leq \phi 5.5$	$\phi 5.5 - \phi 13.7$	$\geq \phi 13.7$
1	$\leq \phi 3.3$	$\phi 3.3 - \phi 4.6$	$\phi 4.6 - \phi 6.1$	$\phi 6.1 - \phi 9.1$	$\phi 9.1 - \phi 18.2$	$\geq \phi 18.2$	$\leq \phi 7.3$	$\phi 7.3 - \phi 18.2$	$\geq \phi 18.2$
1.25	$\leq \phi 4.1$	$\phi 4.1 - \phi 5.7$	$\phi 5.7 - \phi 7.6$	$\phi 7.6 - \phi 11.4$	$\phi 11.4 - \phi 22.8$	$\geq \phi 22.8$	$\leq \phi 9.1$	$\phi 9.1 - \phi 22.8$	$\geq \phi 22.8$
1.5	$\leq \phi 5.0$	$\phi 5.0 - \phi 6.8$	$\phi 6.8 - \phi 9.1$	$\phi 9.1 - \phi 13.7$	$\phi 13.7 - \phi 27.4$	$\geq \phi 27.4$	$\leq \phi 10.9$	$\phi 10.9 - \phi 27.4$	$\geq \phi 27.4$
1.75	$\leq \phi 5.8$	$\phi 5.8 - \phi 8.0$	$\phi 8.0 - \phi 10.6$	$\phi 10.6 - \phi 16.0$	$\phi 16.0 - \phi 31.9$	$\geq \phi 31.9$	$\leq \phi 12.8$	$\phi 12.8 - \phi 31.9$	$\geq \phi 31.9$
2	$\leq \phi 6.6$	$\phi 6.6 - \phi 9.1$	$\phi 9.1 - \phi 12.1$	$\phi 12.1 - \phi 18.2$	$\phi 18.2 - \phi 36.5$	$\geq \phi 36.5$	$\leq \phi 14.6$	$\phi 14.6 - \phi 36.5$	$\geq \phi 36.5$
2.5	$\leq \phi 8.3$	$\phi 8.3 - \phi 11.4$	$\phi 11.4 - \phi 15.2$	$\phi 15.2 - \phi 22.8$	$\phi 22.8 - \phi 45.6$	$\geq \phi 45.6$	$\leq \phi 18.2$	$\phi 18.2 - \phi 45.6$	$\geq \phi 45.6$
3	$\leq \phi 9.9$	$\phi 9.9 - \phi 13.7$	$\phi 13.7 - \phi 18.2$	$\phi 18.2 - \phi 27.3$	$\phi 27.3 - \phi 54.7$	$\geq \phi 54.7$	$\leq \phi 21.9$	$\phi 21.9 - \phi 54.7$	$\geq \phi 54.7$
3.5	$\leq \phi 11.6$	$\phi 11.6 - \phi 15.9$	$\phi 15.9 - \phi 21.3$	$\phi 21.3 - \phi 31.9$	$\phi 31.9 - \phi 63.8$	$\geq \phi 63.8$	$\leq \phi 25.5$	$\phi 25.5 - \phi 63.8$	$\geq \phi 63.8$
4	$\leq \phi 13.2$	$\phi 13.2 - \phi 18.2$	$\phi 18.2 - \phi 24.3$	$\phi 24.3 - \phi 36.5$	$\phi 36.5 - \phi 72.9$	$\geq \phi 72.9$	$\leq \phi 29.2$	$\phi 29.2 - \phi 72.9$	$\geq \phi 72.9$
4.5	$\leq \phi 14.9$	$\phi 14.9 - \phi 20.5$	$\phi 20.5 - \phi 27.3$	$\phi 27.3 - \phi 41.0$	$\phi 41.0 - \phi 82.1$	$\geq \phi 82.1$	$\leq \phi 32.8$	$\phi 32.8 - \phi 82.1$	$\geq \phi 82.1$
5	$\leq \phi 16.5$	$\phi 16.5 - \phi 22.8$	$\phi 22.8 - \phi 30.4$	$\phi 30.4 - \phi 45.6$	$\phi 45.6 - \phi 91.2$	$\geq \phi 91.2$	$\leq \phi 36.5$	$\phi 36.5 - \phi 91.2$	$\geq \phi 91.2$

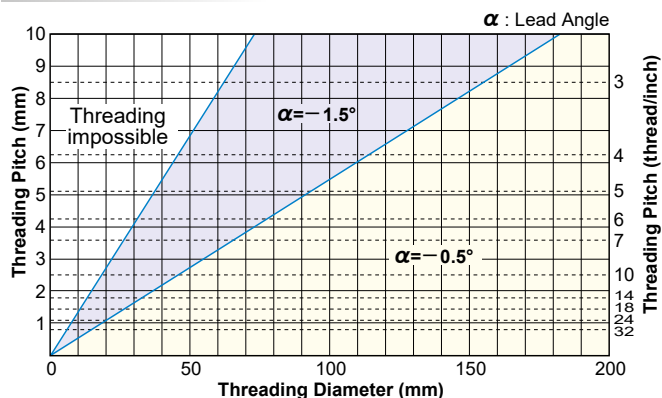
\* Back turning in the case of left hand threads.

### SHIM REFERENCE GRAPH (Thread angle 60° and 55°)

#### Right Hand Thread



#### Left Hand Thread



Note 1) When a thread lead angle  $\leq$  the tool flank angle, change the shim to prevent side interference with the insert.  
(Refer to the table on page G013 for the calculation of thread lead angle and tool flank angle.)

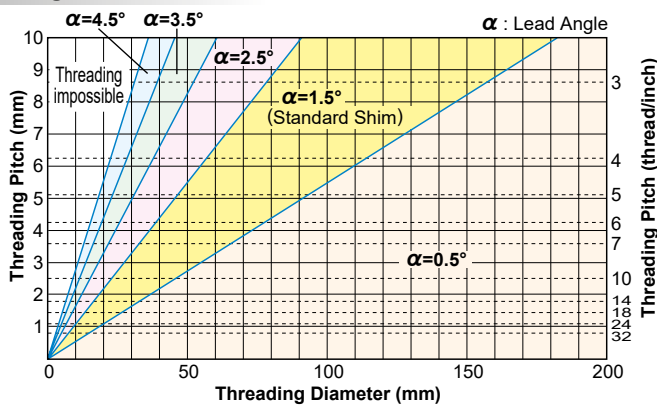
### SHIM REFERENCE TABLE (THREADING DIAMETER) (Thread angle 30° and 29°)

Lead Angle	Pitch (mm)	Right Hand Thread (mm)					Left Hand Thread (mm) *		
		Threading impossible	4.5°	3.5°	2.5°	1.5°	0.5°	Threading impossible	-1.5°
0.5	$\leq \phi 1.8$	$\phi 1.8 - \phi 2.3$	$\phi 2.3 - \phi 3.0$	$\phi 3.0 - \phi 4.6$	$\phi 4.6 - \phi 9.1$	$\geq \phi 9.1$	$\leq \phi 4.6$	$\phi 4.6 - \phi 9.1$	$\geq \phi 9.1$
0.75	$\leq \phi 2.7$	$\phi 2.7 - \phi 3.4$	$\phi 3.4 - \phi 4.6$	$\phi 4.6 - \phi 6.8$	$\phi 6.8 - \phi 13.7$	$\geq \phi 13.7$	$\leq \phi 6.8$	$\phi 6.8 - \phi 13.7$	$\geq \phi 13.7$
1	$\leq \phi 3.6$	$\phi 3.6 - \phi 4.6$	$\phi 4.6 - \phi 6.1$	$\phi 6.1 - \phi 9.1$	$\phi 9.1 - \phi 18.2$	$\geq \phi 18.2$	$\leq \phi 9.1$	$\phi 9.1 - \phi 18.2$	$\geq \phi 18.2$
1.25	$\leq \phi 4.5$	$\phi 4.5 - \phi 5.7$	$\phi 5.7 - \phi 7.6$	$\phi 7.6 - \phi 11.4$	$\phi 11.4 - \phi 22.8$	$\geq \phi 22.8$	$\leq \phi 11.4$	$\phi 11.4 - \phi 22.8$	$\geq \phi 22.8$
1.5	$\leq \phi 5.5$	$\phi 5.5 - \phi 6.8$	$\phi 6.8 - \phi 9.1$	$\phi 9.1 - \phi 13.7$	$\phi 13.7 - \phi 27.4$	$\geq \phi 27.4$	$\leq \phi 13.7$	$\phi 13.7 - \phi 27.4$	$\geq \phi 27.4$
1.75	$\leq \phi 6.4$	$\phi 6.4 - \phi 8.0$	$\phi 8.0 - \phi 10.6$	$\phi 10.6 - \phi 16.0$	$\phi 16.0 - \phi 31.9$	$\geq \phi 31.9$	$\leq \phi 16.0$	$\phi 16.0 - \phi 31.9$	$\geq \phi 31.9$
2	$\leq \phi 7.3$	$\phi 7.3 - \phi 9.1$	$\phi 9.1 - \phi 12.1$	$\phi 12.1 - \phi 18.2$	$\phi 18.2 - \phi 36.5$	$\geq \phi 36.5$	$\leq \phi 18.2$	$\phi 18.2 - \phi 36.5$	$\geq \phi 36.5$
2.5	$\leq \phi 9.1$	$\phi 9.1 - \phi 11.4$	$\phi 11.4 - \phi 15.2$	$\phi 15.2 - \phi 22.8$	$\phi 22.8 - \phi 45.6$	$\geq \phi 45.6$	$\leq \phi 22.8$	$\phi 22.8 - \phi 45.6$	$\geq \phi 45.6$
3	$\leq \phi 10.9$	$\phi 10.9 - \phi 13.7$	$\phi 13.7 - \phi 18.2$	$\phi 18.2 - \phi 27.3$	$\phi 27.3 - \phi 54.7$	$\geq \phi 54.7$	$\leq \phi 27.3$	$\phi 27.3 - \phi 54.7$	$\geq \phi 54.7$
3.5	$\leq \phi 12.7$	$\phi 12.7 - \phi 15.9$	$\phi 15.9 - \phi 21.3$	$\phi 21.3 - \phi 31.9$	$\phi 31.9 - \phi 63.8$	$\geq \phi 63.8$	$\leq \phi 31.9$	$\phi 31.9 - \phi 63.8$	$\geq \phi 63.8$
4	$\leq \phi 14.6$	$\phi 14.6 - \phi 18.2$	$\phi 18.2 - \phi 24.3$	$\phi 24.3 - \phi 36.5$	$\phi 36.5 - \phi 72.9$	$\geq \phi 72.9$	$\leq \phi 36.5$	$\phi 36.5 - \phi 72.9$	$\geq \phi 72.9$
4.5	$\leq \phi 16.4$	$\phi 16.4 - \phi 20.5$	$\phi 20.5 - \phi 27.3$	$\phi 27.3 - \phi 41.0$	$\phi 41.0 - \phi 82.1$	$\geq \phi 82.1$	$\leq \phi 41.0$	$\phi 41.0 - \phi 82.1$	$\geq \phi 82.1$
5	$\leq \phi 18.2$	$\phi 18.2 - \phi 22.8$	$\phi 22.8 - \phi 30.4$	$\phi 30.4 - \phi 45.6$	$\phi 45.6 - \phi 91.2$	$\geq \phi 91.2$	$\leq \phi 45.6$	$\phi 45.6 - \phi 91.2$	$\geq \phi 91.2$

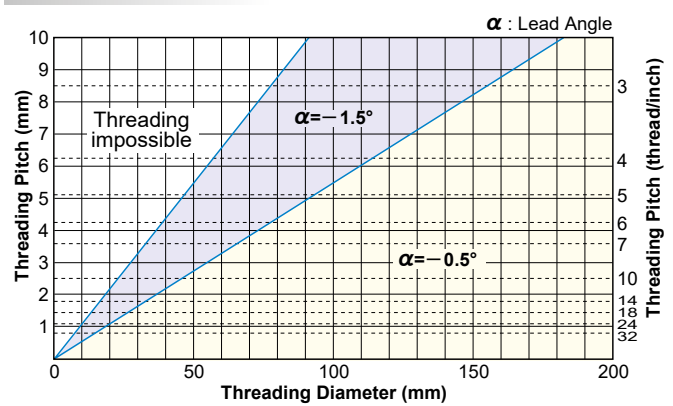
\* Back turning in the case of left hand threads.

## SHIM REFERENCE GRAPH (Thread angle 30° and 29°)

### Right Hand Thread



### Left Hand Thread



Note 1) When a thread lead angle  $\leq$  the tool flank angle, change the shim to prevent side interference with the insert.  
(Refer to the table below for the calculation of thread lead angle and tool flank angle.)

## SELECTION TABLE

Lead Angle	Opening angle 60°/55° Right Hand Thread		Opening angle 60°/55° Left Hand Thread *		Opening angle 30°/29° Right Hand Thread		Opening angle 30°/29° Left Hand Thread *	
0	P05	P05	N05	N05	P05	P05	N05	N05
0.5	P05	P05	N05	N05	P05	P05	N05	N05
1	P15	P15	N15	N15	P15	P15	N15	N15
1.5	P15	P15	N15	N15	P15	P15	N15	N15
2	P25	P25	N15	N15	P25	P25	Compatible	Compatible
2.5	P25	P25	Compatible	Compatible	P25	P25	Compatible	Compatible
3	P35	P35	Compatible	Compatible	P35	P35	Compatible	Compatible
3.5	P35	P35	Compatible	Compatible	P35	P35	Compatible	Compatible
4	P45	P45	Compatible	Compatible	P45	P45	Compatible	Compatible
4.5	P45	P45	Compatible	Compatible	P45	P45	Compatible	Compatible
5	P45	P45	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
5.5	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible

\* Back turning in the case of left hand threads.

When replacing a shim, check if the difference between the thread lead angle and shim inclination angle is within:

2.5° – 0.5° where thread helix angle is 60° (55°)

2° – 1° where thread helix angle is 30° (29°)

\* Inclination angle of a standard shim is 0°.

\* The holder has a 1.5° lead angle.

## CALCULATION OF THREAD LEAD ANGLE

$$\tan \alpha = \frac{l}{\pi d} = \frac{nP}{\pi d}$$

$\alpha$  : Lead angle

$l$  : Lead

$n$  : Number of threads

$P$  : Pitch

$d$  : Effective diameter of thread

## EXAMPLE OF SELECTING A SHIM

- When the thread lead angle is 2.2°

① In the case when the thread helix angle is 60°

(2.2° lead angle) – (2.5° – 0.5°) = -0.3° – 1.7° shim inclination angle is appropriate.

Threading with a standard shim (0° inclination angle) is possible. But, replacing with a shim with a 1° inclination angle is recommended, refer to the Standard Shim List on pages G019 and G026.

② In the case when the thread helix angle is 30°

(2.2° lead angle) – (2° – 1°) = -0.2° – 1.2° shim inclination angle is appropriate.

Replacing with a shim with a 1° inclination angle is recommended, referring to the Standard Shim List on pages G019 and G026.

## RELIEF ANGLE OF AN INSERT SET ON A HOLDER

Thread Helix Angle	Internal Relief Angle	External Relief Angle
60°	8.8°	5.8°
55°	7.9°	5.2°
30°	4.1°	2.7°
29°	4°	2.6°

- Relief angles ( $\beta_2, \beta_1$ ) of an insert become small when the thread helix angle of a trapezoidal, round, or other thread is small. Take care when selecting a shim.

# THREADING

## STANDARD OF DEPTH OF CUT EXTERNAL (RADIAL INFEEED)

### ISO Metric

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts	M-class inserts with 3-D chipbreakers	
0.5	0.31	0.10	0.08	0.07	0.06												MMT16ER050ISO	—
0.75	0.46	0.16	0.14	0.10	0.06												MMT16ER075ISO	—
1.0	0.61	0.18	0.15	0.12	0.10	0.06											MMT16ER100ISO	MMT16ER100ISO-S
1.25	0.77	0.19	0.17	0.14	0.11	0.10	0.06										MMT16ER125ISO	MMT16ER125ISO-S
1.5	0.92	0.22	0.21	0.17	0.14	0.12	0.06										MMT16ER150ISO	MMT16ER150ISO-S
1.75	1.07	0.22	0.21	0.16	0.13	0.11	0.09	0.09	0.06								MMT16ER175ISO	MMT16ER175ISO-S
2.0	1.23	0.24	0.23	0.17	0.16	0.14	0.12	0.11	0.06								MMT16ER200ISO	MMT16ER200ISO-S
2.5	1.53	0.26	0.23	0.19	0.17	0.15	0.13	0.12	0.11	0.11	0.06						MMT16ER250ISO	MMT16ER250ISO-S
3.0	1.84	0.27	0.25	0.20	0.18	0.16	0.14	0.13	0.12	0.12	0.11	0.10	0.06				MMT16ER300ISO	MMT16ER300ISO-S
3.5	2.15	0.33	0.30	0.24	0.21	0.18	0.17	0.15	0.14	0.14	0.12	0.11	0.06				MMT22ER350ISO	—
4.0	2.45	0.34	0.31	0.24	0.22	0.19	0.17	0.16	0.14	0.14	0.13	0.12	0.12	0.11	0.06		MMT22ER400ISO	—
4.5	2.76	0.38	0.34	0.28	0.24	0.22	0.20	0.18	0.16	0.16	0.15	0.14	0.13	0.12	0.06		MMT22ER450ISO	—
5.0	3.07	0.42	0.38	0.32	0.27	0.24	0.22	0.20	0.18	0.18	0.17	0.16	0.15	0.12	0.06		MMT22ER500ISO	—

### American UN

Pitch (thread/inch)	Total Cutting Depth	Number of Passes														Insert Type		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts	M-class inserts with 3-D chipbreakers	
32	0.49	0.17	0.15	0.11	0.06												MMT16ER320UN	—
28	0.56	0.17	0.14	0.10	0.09	0.06											MMT16ER280UN	—
24	0.65	0.18	0.16	0.14	0.11	0.06											MMT16ER240UN	—
20	0.78	0.20	0.18	0.13	0.11	0.10	0.06										MMT16ER200UN	—
18	0.87	0.22	0.20	0.15	0.13	0.11	0.06										MMT16ER180UN	—
16	0.97	0.22	0.20	0.15	0.12	0.11	0.11	0.06									MMT16ER160UN	MMT16ER160UN-S
14	1.11	0.23	0.21	0.16	0.13	0.11	0.11	0.10	0.06								MMT16ER140UN	MMT16ER140UN-S
13	1.20	0.25	0.22	0.17	0.14	0.13	0.12	0.11	0.06								MMT16ER130UN	—
12	1.30	0.28	0.23	0.18	0.16	0.14	0.13	0.12	0.06								MMT16ER120UN	MMT16ER120UN-S
11	1.42	0.28	0.23	0.19	0.16	0.14	0.13	0.12	0.11	0.06							MMT16ER110UN	—
10	1.56	0.28	0.24	0.19	0.16	0.14	0.13	0.13	0.12	0.11	0.06						MMT16ER100UN	—
9	1.73	0.34	0.29	0.22	0.17	0.15	0.14	0.13	0.12	0.11	0.06						MMT16ER090UN	—
8	1.95	0.35	0.30	0.24	0.19	0.16	0.15	0.14	0.13	0.12	0.11	0.06					MMT16ER080UN	—
7	2.22	0.37	0.33	0.28	0.24	0.20	0.17	0.16	0.15	0.14	0.12	0.06					MMT22ER070UN	—
6	2.60	0.42	0.35	0.29	0.25	0.21	0.18	0.17	0.16	0.15	0.13	0.12	0.11	0.06			MMT22ER060UN	—
5	3.12	0.43	0.39	0.31	0.27	0.24	0.22	0.20	0.19	0.19	0.18	0.17	0.15	0.12	0.06		MMT22ER050UN	—

### Whitworth for BSW, BSP

Pitch (thread/inch)	Total Cutting Depth	Number of Passes														Insert Type		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts	M-class inserts with 3-D chipbreakers	
28	0.58	0.17	0.14	0.11	0.10	0.06											MMT16ER280W	—
26	0.63	0.18	0.15	0.13	0.11	0.06											MMT16ER260W	—
20	0.81	0.20	0.18	0.14	0.12	0.11	0.06										MMT16ER200W	—
19	0.86	0.21	0.19	0.15	0.13	0.12	0.06										MMT16ER190W	MMT16ER190W-S
18	0.90	0.25	0.19	0.15	0.13	0.12	0.06										MMT16ER180W	—
16	1.02	0.21	0.18	0.15	0.13	0.11	0.09	0.09	0.06								MMT16ER160W	—
14	1.16	0.23	0.21	0.17	0.14	0.12	0.12	0.11	0.06								MMT16ER140W	MMT16ER140W-S
12	1.36	0.27	0.25	0.20	0.16	0.15	0.14	0.13	0.06								MMT16ER120W	—
11	1.48	0.27	0.24	0.20	0.17	0.15	0.14	0.13	0.12	0.06							MMT16ER110W	MMT16ER110W-S
10	1.63	0.27	0.25	0.20	0.17	0.15	0.15	0.13	0.13	0.12	0.06						MMT16ER100W	—
9	1.81	0.28	0.26	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.06					MMT16ER090W	—
8	2.03	0.30	0.27	0.22	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.06				MMT16ER080W	—
7	2.32	0.34	0.32	0.26	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.12	0.06				MMT22ER070W	—
6	2.71	0.35	0.33	0.27	0.23	0.21	0.20	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.06		MMT22ER060W	—
5	3.25	0.42	0.40	0.35	0.29	0.26	0.24	0.22	0.20	0.19	0.18	0.17	0.15	0.12	0.06		MMT22ER050W	—

### BSPT

Pitch (thread/inch)	Total Cutting Depth	Number of Passes														Insert Type		
		1	2	3	4	5	6	7	8	9						G-class ground inserts	M-class inserts with 3-D chipbreakers	
28	0.58	0.17	0.14	0.11	0.10	0.06											MMT16ER280BSPT	—
19	0.86	0.22	0.19	0.15	0.12	0.12	0.06										MMT16ER190BSPT	MMT16ER190BSPT-S
14	1.16	0.24	0.20	0.17	0.14	0.12	0.12	0.11	0.06								MMT16ER140BSPT	MMT16ER140BSPT-S
11	1.48	0.25	0.23	0.21	0.18	0.16	0.14	0.13	0.12	0.06							MMT16ER110BSPT	MMT16ER110BSPT-S

Note 1) • Set the finishing allowance on a diameter at approx. 0.1mm when using a full form insert.

- Please note the cutting depth and the number of passes when a corner radius of a partial form insert or of an internal threading insert is small to prevent damage to the insert corner.
- Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

## ■ Round DIN 405

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14			
10	1.27	0.23	0.21	0.20	0.19	0.16	0.12	0.10	0.06									MMT16ER100RD
8	1.59	0.23	0.21	0.20	0.19	0.18	0.16	0.14	0.12	0.10	0.06							MMT16ER080RD
6	2.12	0.26	0.25	0.24	0.22	0.21	0.19	0.17	0.16	0.14	0.12	0.10	0.06					MMT16ER060RD
4	3.18	0.34	0.33	0.32	0.30	0.28	0.26	0.24	0.22	0.20	0.19	0.17	0.15	0.12	0.06			MMT22ER040RD

## ■ ISO Trapezoidal 30°

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14			
1.5	0.90	0.23	0.21	0.16	0.13	0.11	0.06											MMT16ER150TR
2.0	1.25	0.29	0.26	0.21	0.17	0.14	0.12	0.06										MMT16ER200TR
3.0	1.75	0.32	0.31	0.24	0.19	0.18	0.17	0.15	0.13	0.06								MMT16ER300TR
4.0	2.25	0.33	0.32	0.24	0.22	0.21	0.17	0.16	0.15	0.14	0.13	0.12	0.16					MMT22ER400TR
5.0	2.75	0.35	0.32	0.26	0.24	0.22	0.21	0.19	0.19	0.17	0.15	0.14	0.13	0.12	0.06			MMT22ER500TR

## ■ American ACME

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14			
12	1.19	0.27	0.23	0.20	0.17	0.14	0.12	0.06										MMT16ER120ACME
10	1.52	0.29	0.25	0.21	0.18	0.16	0.14	0.12	0.11	0.06								MMT16ER100ACME
8	1.84	0.30	0.26	0.22	0.19	0.16	0.15	0.14	0.13	0.12	0.11	0.06						MMT16ER080ACME
6	2.37	0.34	0.30	0.27	0.24	0.21	0.19	0.16	0.14	0.12	0.12	0.11	0.11	0.06				MMT22ER060ACME
5	2.79	0.36	0.33	0.30	0.26	0.23	0.20	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.06			MMT22ER050ACME

## ■ UNJ

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type		
		1	2	3	4	5	6	7	8	9	10	11						
32	0.46	0.16	0.14	0.10	0.06													MMT16ER320UNJ
28	0.52	0.16	0.12	0.09	0.09	0.06												MMT16ER280UNJ
24	0.61	0.17	0.14	0.14	0.10	0.06												MMT16ER240UNJ
20	0.73	0.19	0.16	0.13	0.10	0.09	0.06											MMT16ER200UNJ
18	0.81	0.23	0.18	0.14	0.10	0.10	0.06											MMT16ER180UNJ
16	0.92	0.26	0.21	0.14	0.12	0.10	0.09											MMT16ER160UNJ
14	1.05	0.26	0.23	0.17	0.12	0.11	0.10	0.06										MMT16ER140UNJ
12	1.22	0.28	0.27	0.20	0.17	0.13	0.11	0.06										MMT16ER120UNJ
10	1.47	0.30	0.29	0.21	0.15	0.13	0.12	0.11	0.10	0.06								MMT16ER100UNJ
8	1.83	0.31	0.30	0.23	0.18	0.15	0.14	0.13	0.12	0.11	0.10	0.06						MMT16ER080UNJ

## ■ API Buttress Casing

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type		
		1	2	3	4	5	6	7	8	9	10	11						
5	1.55	0.25	0.23	0.17	0.15	0.13	0.12	0.12	0.11	0.11	0.10	0.06						MMT22ER050APBU

## ■ API Round Casing&Tubing

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type		
		1	2	3	4	5	6	7	8	9	10	11	12					
10	1.41	0.25	0.23	0.16	0.14	0.12	0.12	0.12	0.11	0.10	0.06							MMT16ER100APRD
8	1.81	0.25	0.24	0.19	0.16	0.14	0.14	0.13	0.13	0.13	0.13	0.13	0.11	0.06				MMT16ER080APRD

## ■ American NPT

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
27	0.66	0.15	0.13	0.12	0.11	0.09	0.06											MMT16ER270NPT
18	1.01	0.20	0.16	0.14	0.13	0.12	0.11	0.09	0.06									MMT16ER180NPT
14	1.33	0.23	0.19	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.06							MMT16ER140NPT
11.5	1.64	0.24	0.19	0.17	0.15	0.15	0.13	0.13	0.12	0.11	0.10	0.09	0.06					MMT16ER115NPT
8	2.42	0.33	0.28	0.23	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.11	0.10	0.06		MMT16ER080NPT

## ■ American NPTF

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
27	0.64	0.16	0.14	0.11	0.09	0.08	0.06											MMT16ER270NPTF
18	1.00	0.19	0.16	0.14	0.13	0.12	0.11	0.09	0.06									MMT16ER180NPTF
14	1.35	0.23	0.21	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.06							MMT16ER140NPTF
11.5	1.63	0.24	0.23	0.19	0.15	0.13	0.11	0.11	0.11	0.10	0.10	0.10	0.06					MMT16ER115NPTF
8	2.38	0.32	0.27	0.23	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.11	0.10	0.06		MMT16ER080NPTF

Note 1) • Set the finishing allowance on a diameter at approx. 0.1mm when using a full form insert.

- Please note the cutting depth and the number of passes when a corner radius of a partial form insert or of an internal threading insert is small to prevent damage to the insert corner.
- Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

# THREADING

## STANDARD OF DEPTH OF CUT INTERNAL (RADIAL INFED)

### ISO Metric

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts		M-class inserts with 3-D chipbreakers	
0.5	0.29	0.09	0.07	0.07	0.06											MMT11R050ISO	MMT16R050ISO	—	—
0.75	0.43	0.15	0.13	0.09	0.06											MMT11R075ISO	MMT16R075ISO	—	—
1.0	0.58	0.17	0.15	0.11	0.09	0.06										MMT11R100ISO	MMT16R100ISO	MMT11R100ISO-S	MMT16R100ISO-S
1.25	0.72	0.18	0.16	0.12	0.11	0.09	0.06									MMT11R125ISO	MMT16R125ISO	MMT11R125ISO-S	MMT16R125ISO-S
1.5	0.87	0.21	0.20	0.16	0.13	0.11	0.06									MMT11R150ISO	MMT16R150ISO	MMT11R150ISO-S	MMT16R150ISO-S
1.75	1.01	0.21	0.20	0.15	0.12	0.10	0.09	0.08	0.06							MMT11R175ISO	MMT16R175ISO	—	MMT16R175ISO-S
2.0	1.15	0.24	0.22	0.18	0.14	0.12	0.10	0.09	0.06							MMT11R200ISO	MMT16R200ISO	—	MMT16R200ISO-S
2.5	1.44	0.25	0.24	0.21	0.15	0.13	0.12	0.10	0.09	0.09	0.06					—	MMT16R250ISO	—	MMT16R250ISO-S
3.0	1.73	0.26	0.25	0.22	0.17	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.06			—	MMT16R300ISO	—	MMT16R300ISO-S
3.5	2.02	0.32	0.30	0.23	0.19	0.17	0.15	0.14	0.13	0.12	0.11	0.10	0.06			—	MMT22R350ISO	—	—
4.0	2.31	0.33	0.31	0.24	0.22	0.18	0.15	0.14	0.13	0.12	0.12	0.11	0.10	0.10	0.06	—	MMT22R400ISO	—	—
4.5	2.60	0.36	0.33	0.28	0.24	0.21	0.19	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.06	—	MMT22R450ISO	—	—
5.0	2.89	0.41	0.38	0.32	0.27	0.24	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.06	—	MMT22R500ISO	—	—

### American UN

Pitch (thread/inch)	Total Cutting Depth	Number of Passes														Insert Type			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts		M-class inserts with 3-D chipbreakers	
32	0.46	0.16	0.14	0.10	0.06											MMT11R320UN	MMT16R320UN	—	—
28	0.52	0.16	0.13	0.09	0.08	0.06										MMT11R280UN	MMT16R280UN	—	—
24	0.61	0.17	0.15	0.13	0.10	0.06										MMT11R240UN	MMT16R240UN	—	—
20	0.73	0.18	0.15	0.13	0.11	0.10	0.06									MMT11R200UN	MMT16R200UN	—	—
18	0.81	0.20	0.18	0.14	0.12	0.11	0.06									MMT11R180UN	MMT16R180UN	—	—
16	0.92	0.20	0.18	0.15	0.12	0.11	0.10	0.06								MMT11R160UN	MMT16R160UN	MMT16R160UN-S	—
14	1.05	0.21	0.18	0.15	0.13	0.11	0.11	0.10	0.06							MMT11R140UN	MMT16R140UN	MMT16R140UN-S	—
13	1.13	0.22	0.19	0.16	0.14	0.13	0.12	0.11	0.06							—	MMT16R130UN	—	—
12	1.22	0.24	0.22	0.18	0.16	0.13	0.12	0.11	0.06							—	MMT16R120UN	MMT16R120UN-S	—
11	1.33	0.24	0.22	0.20	0.15	0.12	0.12	0.11	0.11	0.06						—	MMT16R110UN	—	—
10	1.47	0.25	0.22	0.21	0.14	0.13	0.12	0.12	0.11	0.11	0.06					—	MMT16R100UN	—	—
9	1.63	0.31	0.23	0.21	0.17	0.15	0.14	0.13	0.12	0.11	0.06					—	MMT16R090UN	—	—
8	1.83	0.31	0.26	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.11	0.06				—	MMT16R080UN	—	—
7	2.09	0.36	0.30	0.24	0.21	0.18	0.17	0.16	0.15	0.14	0.12	0.06				—	MMT22R070UN	—	—
6	2.44	0.40	0.33	0.25	0.23	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.06		—	MMT22R060UN	—	—
5	2.93	0.41	0.35	0.31	0.26	0.23	0.21	0.20	0.19	0.17	0.15	0.14	0.13	0.12	0.06	—	MMT22R050UN	—	—

### Whitworth for BSW, BSP

Pitch (thread/inch)	Total Cutting Depth	Number of Passes														Insert Type			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts		M-class inserts with 3-D chipbreakers	
28	0.58	0.17	0.14	0.11	0.10	0.06										—	MMT16R280W	—	—
26	0.63	0.18	0.15	0.13	0.11	0.06										—	MMT16R260W	—	—
20	0.81	0.20	0.18	0.14	0.12	0.11	0.06									—	MMT16R200W	—	—
19	0.86	0.21	0.19	0.15	0.13	0.12	0.06									MMT11R190W	MMT16R190W	MMT16R190W-S	—
18	0.90	0.25	0.19	0.15	0.13	0.12	0.06									—	MMT16R180W	—	—
16	1.02	0.21	0.18	0.15	0.13	0.11	0.09	0.09	0.06							—	MMT16R160W	—	—
14	1.16	0.23	0.21	0.17	0.14	0.12	0.12	0.11	0.06							MMT11R140W	MMT16R140W	MMT16R140W-S	—
12	1.36	0.27	0.25	0.20	0.16	0.15	0.14	0.13	0.06							—	MMT16R120W	MMT16R120W-S	—
11	1.48	0.27	0.24	0.20	0.17	0.15	0.14	0.13	0.12	0.06						—	MMT16R110W	—	—
10	1.63	0.27	0.25	0.20	0.17	0.15	0.15	0.13	0.13	0.12	0.06					—	MMT16R100W	—	—
9	1.81	0.28	0.26	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.06				—	MMT16R090W	—	—
8	2.03	0.30	0.27	0.22	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.06			—	MMT16R080W	—	—
7	2.32	0.34	0.32	0.26	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.12	0.06			—	MMT22R070W	—	—
6	2.71	0.35	0.33	0.27	0.23	0.21	0.20	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.06	—	MMT22R060W	—	—
5	3.25	0.42	0.40	0.35	0.29	0.26	0.24	0.22	0.20	0.19	0.18	0.17	0.15	0.12	0.06	—	MMT22R050W	—	—

Note 1) • Set the finishing allowance on a diameter at approx. 0.1mm when using a full form insert.

- Please note the cutting depth and the number of passes when a corner radius of a partial form insert or of an internal threading insert is small to prevent damage to the insert corner.
- Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.



## ■ BSPT

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes													Insert Type					
		1	2	3	4	5	6	7	8	9								G-class ground inserts	M-class inserts with 3-D chipbreakers	
19	0.86	0.22	0.19	0.15	0.12	0.12	0.06											MMT11R190BSPT	MMT16R190BSPT	MMT16R190BSPT-S
14	1.16	0.24	0.20	0.17	0.14	0.12	0.12	0.11	0.06									MMT11R140BSPT	MMT16R140BSPT	MMT16R140BSPT-S
11	1.48	0.25	0.23	0.21	0.18	0.16	0.14	0.13	0.12	0.06								—	MMT16R110BSPT	MMT16R110BSPT-S

## ■ Round DIN 405

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14					
10	1.27	0.23	0.21	0.20	0.19	0.16	0.12	0.10	0.06											MMT16R100RD
8	1.59	0.23	0.21	0.20	0.19	0.18	0.16	0.14	0.12	0.10	0.06									MMT16R080RD
6	2.12	0.26	0.25	0.24	0.22	0.21	0.19	0.17	0.16	0.14	0.12	0.10	0.06							MMT16R060RD
4	3.18	0.34	0.33	0.32	0.30	0.28	0.26	0.24	0.22	0.20	0.19	0.17	0.15	0.12	0.06					MMT22R040RD

## ■ ISO Trapezoidal 30°

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14						
1.5	0.90	0.23	0.21	0.16	0.13	0.11	0.06													MMT16R150TR	
2	1.25	0.29	0.26	0.21	0.17	0.14	0.12	0.06													MMT16R200TR
3	1.75	0.32	0.31	0.24	0.19	0.18	0.17	0.15	0.13	0.06											MMT16R300TR
4	2.25	0.33	0.32	0.24	0.22	0.21	0.17	0.16	0.15	0.14	0.13	0.12	0.06								MMT22R400TR
5	2.75	0.35	0.32	0.26	0.24	0.22	0.21	0.19	0.19	0.17	0.15	0.14	0.13	0.12	0.06						MMT22R500TR

## ■ American ACME

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14						
12	1.19	0.27	0.23	0.20	0.17	0.14	0.12	0.06													MMT16R120ACME
10	1.52	0.29	0.25	0.21	0.18	0.16	0.14	0.12	0.11	0.06											MMT16R100ACME
8	1.84	0.30	0.26	0.22	0.19	0.16	0.15	0.14	0.13	0.12	0.11	0.06									MMT16R080ACME
6	2.37	0.34	0.30	0.27	0.24	0.21	0.19	0.16	0.14	0.12	0.12	0.11	0.11	0.06							MMT22R060ACME
5	2.79	0.36	0.33	0.30	0.26	0.23	0.20	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.06						MMT22R050ACME

## ■ API Buttress Casing

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type					
		1	2	3	4	5	6	7	8	9	10	11									
5	1.55	0.25	0.23	0.17	0.15	0.13	0.12	0.12	0.11	0.11	0.10	0.06									MMT22R050APBU

## ■ API Round Casing&Tubing

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes												Insert Type							
		1	2	3	4	5	6	7	8	9	10	11	12								
10	1.41	0.25	0.23	0.16	0.14	0.12	0.12	0.12	0.11	0.10	0.06										MMT16R100APRD
8	1.81	0.25	0.24	0.19	0.16	0.14	0.14	0.13	0.13	0.13	0.13	0.11	0.06								MMT16R080APRD

## ■ American NPT

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15					
27	0.66	0.15	0.13	0.12	0.11	0.09	0.06														MMT16R270NPT
18	1.01	0.20	0.16	0.14	0.13	0.12	0.11	0.09	0.06												MMT16R180NPT
14	1.33	0.23	0.19	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.06										MMT16R140NPT
11.5	1.64	0.24	0.19	0.17	0.15	0.15	0.13	0.13	0.12	0.11	0.10	0.09	0.06								MMT16R115NPT
8	2.42	0.33	0.28	0.23	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.11	0.10	0.06					MMT16R080NPT

## ■ American NPTF

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15					
14	1.35	0.23	0.21	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.06										MMT16R140NPTF
11.5	1.63	0.24	0.23	0.19	0.15	0.13	0.11	0.11	0.11	0.10	0.10	0.10	0.06								MMT16R115NPTF
8	2.38	0.32	0.27	0.23	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.11	0.10	0.06					MMT16R080NPTF

Note 1) • Set the finishing allowance on a diameter at approx. 0.1mm when using a full form insert.

- Please note the cutting depth and the number of passes when a corner radius of a partial form insert or of an internal threading insert is small to prevent damage to the insert corner.
- Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

# MMT SERIES ORDER NUMBER

## HOLDERS

**EXTERNAL**

**MMT E R 12 12 H 16 - C**

<b>Designation</b>	<b>Application</b>	<b>Tool Size (mm) (Height and Width)</b>		<b>Tool Length (mm)</b>		<b>Insert Size (mm)</b>		<b>Method of Holding</b>
E	External	12	12	H	100	16	9.525	C
R	Right	16	16	K	125	22	12.7	
		20	20	M	150			
		25	25	P	170			
		32	32					

**INTERNAL**

**MMT I R 13 16 A K 11 - S P15**

<b>Designation</b>	<b>Application</b>	<b>Min. Cutting Diameter (mm)</b>	<b>Tool Length (mm)</b>				<b>Insert Size (mm)</b>		<b>Lead Angle</b>	
I	Internal	13	K	125	R	200	11	6.35	P15	1.5°
R	Right	Shank Diameter (mm)	M	150	S	250	16	9.525	P25	2.5°
		Shank Material	Q	180	T	300	22	12.7	P35	3.5°
		A								
		Steel Shank with Coolant Hole								

G  
THREADING

## INSERTS

**M-CLASS**

**MMT 16 E R 100 ISO - S**

<b>Designation</b>	<b>Application</b>	<b>Pitch</b>		<b>Threading Type</b>	
16	External	100	1.0mm	60	Partial Profile 60°
R	Right	125	1.25mm	55	Partial Profile 55°
		150	1.5mm	ISO	ISO Metric
		175	1.75mm	W	Whitworth for BSW, BSP
		200	2.0mm	BSPT	BSPT
		250	2.5mm	UN	American UN
		300	3.0mm		

**G-CLASS**

**MMT 16 E R 050 ISO**

<b>Designation</b>	<b>Application</b>	<b>Pitch</b>				<b>Threading Type</b>	
16	External	050	0.5mm	A	0.5—1.5mm or 48—16 thread/inch	60	Partial Profile 60°
R	Right	075	0.75mm	G	1.75—3.0mm or 14—8 thread/inch	55	Partial Profile 55°
		100	1.0mm			ISO	ISO Metric
		125	1.25mm	AG	0.5—3.0mm or 48—8 thread/inch	W	Whitworth for BSW, BSP
		150	1.5mm			BSPT	BSPT
		175	1.75mm	N	3.5—5.0mm or 7—5 thread/inch	UN	American UN
		200	2.0mm			RD	Round DIN 405
		250	2.5mm			TR	ISO Trapezoidal 30°
		300	3.0mm			ACME	American ACME
		350	3.5mm			UNJ	UNJ
		400	4.0mm			APBU	API Buttress Casing
		450	4.5mm			APRD	API Round Casing&Tubing
		500	5.0mm			NPT	NPT
						NPTF	NPTF

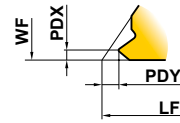
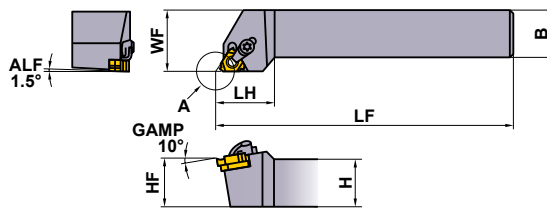
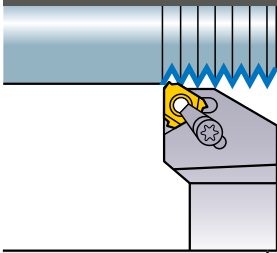
# EXTERNAL THREADING

## MMTE HOLDER

- Various insert types.
- Precision class insert.
- Available with a wiper cutting edge to provide a precise thread geometry.
- Able to change lead angle by replacing the shim.

### MMTE

External threading



Details of position A  
Refer to page G020—G023,  
for size PDX, PDY.

Right hand tool holder only.

Order Number	Stock R	Insert Number	Dimensions (mm)						Clamp Bridge	Clamp Screw *	Stop Ring	Shim Screw *	Shim	Wrench
			H	B	LF	LH	HF	WF						
MMTER1212H16-C	●	MMT16ER ○○○○○	12	12	100	25	12	16	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER1616H16-C	●		16	16	100	25	16	20	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER2020K16-C	●		20	20	125	26	20	25	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER2525M16-C	●		25	25	150	28	25	32	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER3232P16-C	●		32	32	170	32	32	40	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER2525M22-C	●	MMT22ER ○○○○○	25	25	150	32	25	32	SETK61	SETS61	CR5	HFC04010	CTE43TP15	①TKY20F ②HKY25R
MMTER3232P22-C	●		32	32	170	32	32	40	SETK61	SETS61	CR5	HFC04010	CTE43TP15	①TKY20F ②HKY25R

Note 1) Select and use a shim as shown below (sold separately), dependant on the lead angle.

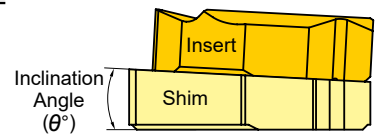
\* Clamp Torque (N • m) : SETS51=3.5, SETS61=5.0, HFC03008=1.5, HFC04010=2.2

### SHIM

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
-1.5°	CTE32TN15	●	-3°	MMTER ○○○○○ 16-C
-0.5°	CTE32TN05	●	-2°	
0.5°	CTE32TP05	●	-1°	
1.5°	CTE32TP15	●	0°	
2.5°	CTE32TP25	●	1°	
3.5°	CTE32TP35	●	2°	
4.5°	CTE32TP45	●	3°	

Standard shim delivered with the holder.

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
-1.5°	CTE43TN15	●	-3°	MMTER ○○○○○ 22-C
-0.5°	CTE43TN05	●	-2°	
0.5°	CTE43TP05	●	-1°	
1.5°	CTE43TP15	●	0°	
2.5°	CTE43TP25	●	1°	
3.5°	CTE43TP35	●	2°	
4.5°	CTE43TP45	●	3°	



G

THREADING

### RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (m/min)
P	Mild Steel	≤180HB	VP10MF	150 (70—230)
			VP15TF	100 (60—140)
			VP20RT	80 (60—100)
M	Carbon Steel Alloy Steel	180—280HB	VP10MF	140 (80—200)
			VP15TF	100 (60—140)
			VP20RT	80 (60—100)
M	Stainless Steel	≤200HB	VP15TF VP20RT	80 (40—120)
K	Gray Cast Iron	Tensile Strength ≤350MPa	VP10MF	140 (80—200)
			VP15TF	90 (60—120)

● : Inventory maintained.

	Work Material	Hardness	Grade	Cutting Speed (m/min)
S	Heat-Resistant Alloy	—	VP10MF	45 (15—70)
			VP15TF	30 (20—40)
			VP20RT	
H	Titanium Alloy	—	VP10MF	60 (40—80)
			VP15TF	45 (25—65)
			VP20RT	
H	Heat-Treated Alloy	45—55HRC	VP10MF VP15TF	50 (30—70) 40 (20—60)

HOW TO SELECT A SHIM > G012  
SPARE PARTS > N001  
TECHNICAL DATA > P001

G019

# EXTERNAL THREADING

# MMT M-CLASS INSERTS WITH 3-D CHIPBREAKERS

## INSERTS

Type	Order Number	Coated		Pitch		Dimensions (mm)					Total Cutting Depth (mm)	Geometry
		VP15TF	VP20RT	mm	thread/inch	IC	S	PDY	PDX	RE		
Partial Profile 60°	MMT16ERA60-S	●		0.5–1.5	48–16	9.525	3.44	0.8	0.9	0.06	—	
	MMT16ERG60-S	●		1.75–3.0	14–8	9.525	3.44	1.2	1.7	0.23	—	
Partial Profile 55°	MMT16ERA55-S	●			48–16	9.525	3.44	0.8	0.9	0.07	—	
	MMT16ERG55-S	●			14–8	9.525	3.44	1.2	1.7	0.23	—	
ISO Metric	MMT16ER100ISO-S	●	●	1.0		9.525	3.44	0.7	0.7	0.13	0.61	
	MMT16ER125ISO-S	●	●	1.25		9.525	3.44	0.8	0.9	0.16	0.77	
	MMT16ER150ISO-S	●	●	1.5		9.525	3.44	0.8	1.0	0.20	0.92	
	MMT16ER175ISO-S	●	●	1.75		9.525	3.44	0.9	1.2	0.22	1.07	
	MMT16ER200ISO-S	●	●	2.0		9.525	3.44	1.0	1.3	0.26	1.23	
	MMT16ER250ISO-S	●	●	2.5		9.525	3.44	1.1	1.5	0.33	1.53	
	MMT16ER300ISO-S	●	●	3.0		9.525	3.44	1.2	1.6	0.40	1.84	
American UN	MMT16ER160UN-S	●			16	9.525	3.44	0.9	1.1	0.23	0.97	
	MMT16ER140UN-S	●			14	9.525	3.44	1.0	1.2	0.26	1.11	
	MMT16ER120UN-S	●			12	9.525	3.44	1.1	1.4	0.30	1.30	
Whitworth for BSW, BSP	MMT16ER190W-S	●			19	9.525	3.44	0.8	1.0	0.18	0.86	
	MMT16ER140W-S	●			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT16ER110W-S	●			11	9.525	3.44	1.1	1.5	0.32	1.48	
BSPT	MMT16ER190BSPT-S	●			19	9.525	3.44	0.8	0.9	0.18	0.86	
	MMT16ER140BSPT-S	●			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT16ER110BSPT-S	●			11	9.525	3.44	1.1	1.5	0.32	1.48	

G  
THREADING

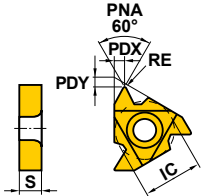
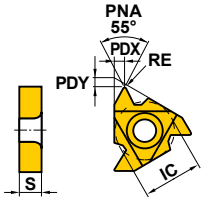
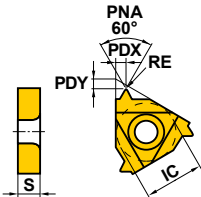
## IDENTIFICATION

<b>MMT</b>	<b>16</b>	<b>E</b>	<b>R</b>	<b>100</b>	<b>ISO</b>	<b>-</b>	<b>S</b>	M-class inserts with 3-D chipbreakers
<b>Designation</b>	<b>Diameter of Inscribed Circle (mm)</b>	<b>Application</b>	<b>Hand of Tool</b>	<b>Pitch</b>		<b>Threading Type</b>		
	11 6.35 16 9.525	E External I Internal	R Right	100 1.0mm 125 1.25mm 150 1.5mm 175 1.75mm 200 2.0mm 250 2.5mm 300 3.0mm	A 0.5–1.5mm or 48–16 thread/inch G 1.75–3.0mm or 14–8 thread/inch	60 Partial Profile 60° 55 Partial Profile 55° ISO ISO Metric W Whitworth for BSW, BSP BSPT BSPT UN American UN		

● : Inventory maintained.  
(5 inserts in one case)

# MMT G-CLASS GROUND INSERTS

## INSERTS

Type	Thread Tolerance	Order Number	Coated		Pitch		Dimensions (mm)					Total Cutting Depth (mm)	Geometry											
			VP10MF	VP15TF	mm	thread/inch	IC	S	PDY	PDX	RE													
Partial Profile 60°	—	MMT16ERA60	●	●	0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.05	—	Partial form 											
		MMT16ERG60	●	●	1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.27													
		MMT16ERAG60	●	●	0.5—3.0	48—8	9.525	3.44	1.2	1.7	0.08													
		MMT22ERN60	●	●	3.5—5.0	7—5	12.7	4.64	1.7	2.5	0.53													
Partial Profile 55°	—	MMT16ERA55	●	●		48—16	9.525	3.44	0.8	0.9	0.05	—	Partial form 											
		MMT16ERG55	●	●		14—8	9.525	3.44	1.2	1.7	0.21													
		MMT16ERAG55	●	●		48—8	9.525	3.44	1.2	1.7	0.07													
		MMT22ERN55	●	●		7—5	12.7	4.64	1.7	2.5	0.44													
ISO Metric 6g	—	MMT16ER050ISO	●	●	0.5		9.525	3.44	0.6	0.4	0.06	0.31	Full form 											
		MMT16ER075ISO	●	●	0.75		9.525	3.44	0.6	0.6	0.10			0.46										
		MMT16ER100ISO	●	●	1.0		9.525	3.44	0.7	0.7	0.16				0.61									
		MMT16ER125ISO	●	●	1.25		9.525	3.44	0.8	0.9	0.19					0.77								
		MMT16ER150ISO	●	●	1.5		9.525	3.44	0.8	1.0	0.23						0.92							
		MMT16ER175ISO	●	●	1.75		9.525	3.44	0.9	1.2	0.21							1.07						
		MMT16ER200ISO	●	●	2.0		9.525	3.44	1.0	1.3	0.31								1.23					
		MMT16ER250ISO	●	●	2.5		9.525	3.44	1.1	1.5	0.32									1.53				
		MMT16ER300ISO	●	●	3.0		9.525	3.44	1.2	1.6	0.46										1.84			
		MMT22ER350ISO	●	●	3.5		12.7	4.64	1.6	2.3	0.45											2.15		
		MMT22ER400ISO	●	●	4.0		12.7	4.64	1.6	2.3	0.52												2.45	
		MMT22ER450ISO	●	●	4.5		12.7	4.64	1.7	2.4	0.58													2.76
		MMT22ER500ISO	●	●	5.0		12.7	4.64	1.7	2.5	0.63													

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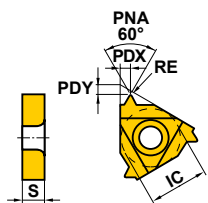
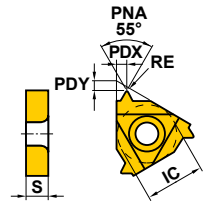
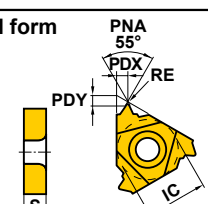
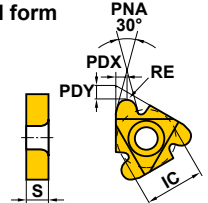
THREADING

## IDENTIFICATION

<b>MMT</b>	<b>16</b>	<b>E</b>	<b>R</b>	<b>050</b>	<b>ISO</b>
<b>Designation</b>	<b>Diameter of Inscribed Circle (mm)</b>	<b>Application</b>	<b>Hand of Tool</b>	<b>Pitch</b>	<b>Threading Type</b>
	11 6.35	E External	R Right	050 0.5mm	60 Partial Profile 60°
	16 9.525	I Internal		075 0.75mm	55 Partial Profile 55°
	22 12.7			100 1.0mm	ISO ISO Metric
				125 1.25mm	W Whitworth for BSW, BSP
				150 1.5mm	BSPT BSPT
				175 1.75mm	UN American UN
				200 2.0mm	RD Round DIN 405
				250 2.5mm	TR ISO Trapezoidal 30°
				300 3.0mm	ACME American ACME
				350 3.5mm	UNJ UNJ
				400 4.0mm	APBU API Buttress Casing
				450 4.5mm	APRD API Round Casing & Tubing
				500 5.0mm	NPT NPT
					NPTF NPTF

# MMT G-CLASS GROUND INSERTS

## INSERTS

Type	Thread Tolerance	Order Number	Coated		Pitch		Dimensions (mm)					Total Cutting Depth (mm)	Geometry
			VP10MF	VP15TF	mm	thread/inch	IC	S	PDY	PDX	RE		
American UN	2A	MMT16ER320UN	●			32	9.525	3.44	0.6	0.6	0.09	0.49	Full form 
		MMT16ER280UN	●			28	9.525	3.44	0.6	0.7	0.10	0.56	
		MMT16ER240UN	●			24	9.525	3.44	0.7	0.8	0.16	0.65	
		MMT16ER200UN	●			20	9.525	3.44	0.8	0.9	0.19	0.78	
		MMT16ER180UN	●			18	9.525	3.44	0.8	1.0	0.21	0.87	
		MMT16ER160UN	●	●		16	9.525	3.44	0.9	1.1	0.24	0.97	
		MMT16ER140UN	●	●		14	9.525	3.44	1.0	1.2	0.22	1.11	
		MMT16ER130UN	★			13	9.525	3.44	1.0	1.3	0.24	1.20	
		MMT16ER120UN	●	●		12	9.525	3.44	1.1	1.4	0.32	1.30	
		MMT16ER110UN	★			11	9.525	3.44	1.1	1.5	0.29	1.42	
		MMT16ER100UN	●			10	9.525	3.44	1.1	1.5	0.32	1.56	
		MMT16ER090UN	★			9	9.525	3.44	1.2	1.7	0.35	1.73	
		MMT16ER080UN	●			8	9.525	3.44	1.2	1.6	0.48	1.95	
		MMT22ER070UN	●			7	12.7	4.64	1.6	2.3	0.47	2.22	
		MMT22ER060UN	●			6	12.7	4.64	1.6	2.3	0.53	2.60	
MMT22ER050UN	●			5	12.7	4.64	1.7	2.5	0.64	3.12			
Whitworth for BSW, BSP	Medium Class A	MMT16ER280W	●			28	9.525	3.44	0.6	0.7	0.09	0.58	Full form 
		MMT16ER260W	●			26	9.525	3.44	0.7	0.8	0.10	0.63	
		MMT16ER200W	●			20	9.525	3.44	0.8	0.9	0.18	0.81	
		MMT16ER190W	●	●		19	9.525	3.44	0.8	1.0	0.19	0.86	
		MMT16ER180W	●			18	9.525	3.44	0.8	1.0	0.20	0.90	
		MMT16ER160W	●			16	9.525	3.44	0.9	1.1	0.23	1.02	
		MMT16ER140W	●	●		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT16ER120W	★			12	9.525	3.44	1.1	1.4	0.30	1.36	
		MMT16ER110W	●	●		11	9.525	3.44	1.1	1.5	0.33	1.48	
		MMT16ER100W	★			10	9.525	3.44	1.1	1.5	0.37	1.63	
		MMT16ER090W	★			9	9.525	3.44	1.2	1.7	0.34	1.81	
		MMT16ER080W	●			8	9.525	3.44	1.2	1.5	0.39	2.03	
		MMT22ER070W	●			7	12.7	4.64	1.6	2.3	0.46	2.32	
		MMT22ER060W	●			6	12.7	4.64	1.6	2.3	0.53	2.71	
MMT22ER050W	●			5	12.7	4.64	1.7	2.4	0.66	3.25			
BSPT	Standard BSPT	MMT16ER280BSPT	●			28	9.525	3.44	0.6	0.6	0.09	0.58	Full form 
		MMT16ER190BSPT	●	●		19	9.525	3.44	0.8	0.9	0.14	0.86	
		MMT16ER140BSPT	●	●		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT16ER110BSPT	●	●		11	9.525	3.44	1.1	1.5	0.33	1.48	
Round DIN 405	7h	MMT16ER100RD	●			10	9.525	3.44	1.1	1.2	0.60	1.27	Full form 
		MMT16ER080RD	●			8	9.525	3.44	1.4	1.3	0.75	1.59	
		MMT16ER060RD	●			6	9.525	3.44	1.5	1.7	1.00	2.12	
		MMT22ER040RD	●			4	9.525	3.44	2.2	2.3	1.51	3.18	

THREADING

G

● : Inventory maintained. ★ : Inventory maintained in Japan.  
(5 inserts in one case)

# INSERTS

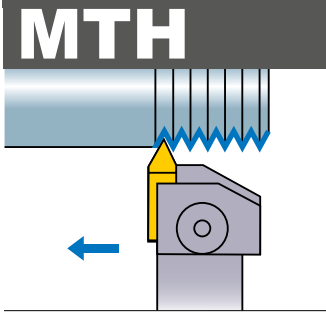
Type	Thread Tolerance	Order Number	Coated VP10MF	Pitch		Dimensions (mm)					Total Cutting Depth (mm)	Geometry
				mm	thread/inch	IC	S	PDY	PDX	RE		
ISO Trapezoidal 30°	7e	MMT16ER150TR	●	1.5		9.525	3.44	1.0	1.1	0.08	0.90	
		MMT16ER200TR	●	2.0		9.525	3.44	1.1	1.3	0.15	1.25	
		MMT16ER300TR	●	3.0		9.525	3.44	1.3	1.5	0.15	1.75	
		MMT22ER400TR	●	4.0		12.7	4.64	1.7	1.9	0.15	2.25	
		MMT22ER500TR	●	5.0		12.7	4.64	2.1	2.5	0.15	2.75	
American ACME	3G	MMT16ER120ACME	●		12	9.525	3.44	1.1	1.2	0.08	1.19	
		MMT16ER100ACME	●		10	9.525	3.44	1.3	1.4	0.08	1.52	
		MMT16ER080ACME	●		8	9.525	3.44	1.4	1.5	0.10	1.84	
		MMT22ER060ACME	●		6	12.7	4.64	1.8	2.1	0.10	2.37	
		MMT22ER050ACME	●		5	12.7	4.64	2.0	2.3	0.10	2.79	
UNJ	3A	MMT16ER320UNJ	●		32	9.525	3.44	0.6	0.7	0.13	0.46	
		MMT16ER280UNJ	●		28	9.525	3.44	0.7	0.7	0.14	0.52	
		MMT16ER240UNJ	●		24	9.525	3.44	0.7	0.8	0.17	0.61	
		MMT16ER200UNJ	●		20	9.525	3.44	0.8	0.9	0.20	0.73	
		MMT16ER180UNJ	●		18	9.525	3.44	0.8	1.0	0.22	0.81	
		MMT16ER160UNJ	●		16	9.525	3.44	0.9	1.1	0.25	0.92	
		MMT16ER140UNJ	●		14	9.525	3.44	1.0	1.2	0.29	1.05	
		MMT16ER120UNJ	●		12	9.525	3.44	1.1	1.3	0.33	1.22	
		MMT16ER100UNJ	★		10	9.525	3.44	1.2	1.5	0.40	1.47	
		MMT16ER080UNJ	★		8	9.525	3.44	1.2	1.6	0.51	1.83	
API Buttress Casing	Standard API	MMT22ER050APBU	★		5	12.7	4.64	3.1	1.9	0.18	1.55	
API Round Casing & Tubing	Standard API RD	MMT16ER100APRD	●		10	9.525	3.44	1.2	1.4	0.34	1.41	
		MMT16ER080APRD	●		8	9.525	3.44	1.3	1.5	0.41	1.81	
American NPT	Standard NPT	MMT16ER270NPT	★		27	9.525	3.44	0.7	0.8	0.04	0.66	
		MMT16ER180NPT	●		18	9.525	3.44	0.8	1.0	0.08	1.01	
		MMT16ER140NPT	●		14	9.525	3.44	0.9	1.2	0.09	1.33	
		MMT16ER115NPT	●		11.5	9.525	3.44	1.1	1.5	0.11	1.64	
		MMT16ER080NPT	●		8	9.525	3.44	1.3	1.8	0.14	2.42	
American NPTF	Class 2	MMT16ER270NPTF	★		27	9.525	3.44	0.7	0.8	0.04	0.64	
		MMT16ER180NPTF	●		18	9.525	3.44	0.8	1.0	0.04	1.00	
		MMT16ER140NPTF	●		14	9.525	3.44	0.9	1.2	0.04	1.35	
		MMT16ER115NPTF	●		11.5	9.525	3.44	1.1	1.5	0.04	1.63	
		MMT16ER080NPTF	●		8	9.525	3.44	1.3	1.8	0.04	2.38	

G  
THREADING

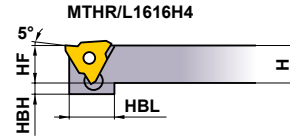
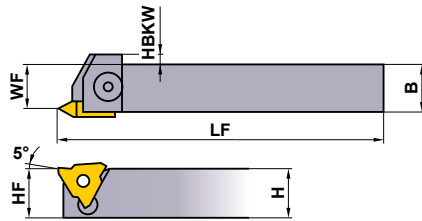
# EXTERNAL THREADING

## MT HOLDER

- Clamp-on type.
- Positive insert suffers from negligible chattering and thus produces good finished surfaces.
- Thread pitch  $\leq 4.5\text{mm}$ .



### External threading



Right hand tool holder shown.

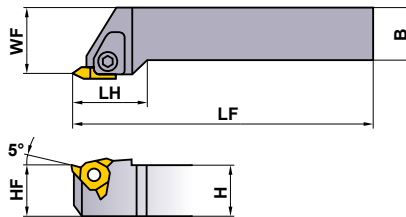
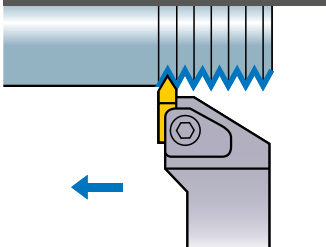
Note 1) Cutting in the opposite direction is not possible.

Order Number	Stock		Insert Number	Dimensions (mm)							Clamp Bridge	Clamp Screw *	Spring	Wrench	
	R	L		H	B	LF	HF	WF	HBKW	HBH					HBL
<b>MTHR/L1616H4</b>	★	★	MTTR/L43○○○○	16	16	100	16	13.8	3	3	21	MTK1R/L	HBH06020	MES3	HKY40R
<b>MTHR/L2020K4</b>	●	★		20	20	125	20	17.8	—	—	—	MTK1R/L	HBH06020	MES3	HKY40R
<b>MTHR/L2525M4</b>	●	★		25	25	150	25	22.8	—	—	—	MTK1R/L	HBH06020	MES3	HKY40R

\* Clamp Torque (N · m) : HBH06020=7.0

## MT1

### External threading



Right hand tool holder shown.

Note 1) Cutting in the opposite direction is not possible.

Order Number	Stock		Insert Number	Dimensions (mm)							Clamp Bridge	Clamp Screw *	Spring	Wrench
	R	L		H	B	LF	LH	HF	WF					
<b>MT1R/L2020K4</b>	★	★	MTTR/L43○○○○	20	20	125	30	20	25	MTK1R/L	HBH06020	MES3	HKY40R	
<b>MT1R/L2525M4</b>	★	★		25	25	150	30	25	32	MTK1R/L	HBH06020	MES3	HKY40R	
<b>MT1R/L3232P4</b>	★	★		32	32	170	30	32	40	MTK1R/L	HBH06020	MES3	HKY40R	

\* Clamp Torque (N · m) : HBH06020=7.0

## RECOMMENDED CUTTING CONDITIONS

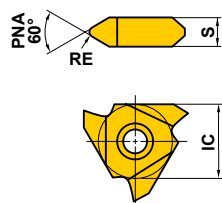
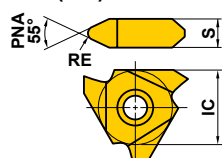
Work Material	Hardness	Grade	Cutting Speed (m/min)
<b>P</b> Mild Steel	$\leq 180\text{HB}$	UP20M	140 (100–180)
		NX2525	200 (150–250)
		UTi20T	120 (100–150)
Carbon Steel Alloy Steel	180–280HB	UP20M	120 (100–150)
		NX2525	170 (150–200)
		UTi20T	100 (70–120)

Work Material	Hardness	Grade	Cutting Speed (m/min)
<b>M</b> Stainless Steel	$\leq 200\text{HB}$	UP20M	120 (80–150)
		UTi20T	100 (70–130)
<b>K</b> Gray Cast Iron	Tensile Strength $\leq 350\text{MPa}$	UP20M	80 (60–100)
		UTi20T	80 (60–100)
		HTi10	100 (70–130)

● : Inventory maintained. ★ : Inventory maintained in Japan.  
(10 inserts in one case)

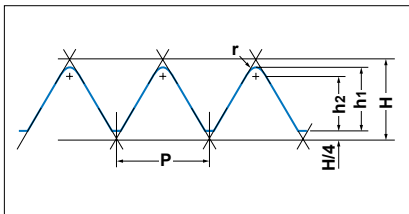


# INSERTS

Type	Order Number	Class	Coated		Cermet		Carbide		ISO Pitch mm (thread/inch)	Dimensions (mm)			Geometry
			UP20M	NX2525	UTi20T	HTi10	IC	S		RE			
Partial Profile 60°	<b>MTTR436000</b>	G		●	●			-0.8	12.7	4.76	0	<b>MTTR/L(60°)</b>  Right hand insert shown.	
	<b>MTTR436001</b>	G	★	●	●	★		1.0-1.75	12.7	4.76	0.1		
	<b>MTTL436001</b>	G	★		●	★		1.0-1.75	12.7	4.76	0.1		
	<b>MTTR436002</b>	G	★	●	●	★		2.0-2.5	12.7	4.76	0.2		
	<b>MTTL436002</b>	G		●	●			2.0-2.5	12.7	4.76	0.2		
	<b>MTTR436003</b>	G	★	●	●	★		3.0-3.5	12.7	4.76	0.3		
	<b>MTTL436003</b>	G		●	●			3.0-3.5	12.7	4.76	0.3		
	<b>MTTR436004</b>	G		●	●			4.0-4.5	12.7	4.76	0.4		
Partial Profile 55°	<b>MTTR435501</b>	G		●	★			(28-10)	12.7	4.76	0.1	<b>MTTR(55°)</b>  Right hand insert only.	
	<b>MTTR435502</b>	G		●	●			(16-8)	12.7	4.76	0.2		
	<b>MTTR435503</b>	G		●	●			(11-8)	12.7	4.76	0.3		

## STANDARD OF DEPTH OF CUT

- The chart on the right shows the cutting depths when machining external ISO metric screw threads.
- When using cermet grades or cutting stainless steel, please increase the number of passes by 2-3 times.



## METRIC SCREW THREAD

P (Pitch)	0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50	
<b>h1</b>	0.46	0.61	0.77	0.92	1.07	1.23	1.53	1.84	2.15	2.45	2.76	
<b>h2</b>	0.35	0.47	0.59	0.70	0.82	0.94	1.17	1.41	1.65	1.87	2.11	
<b>r (Corner Radius)</b>	0.11	0.14	0.18	0.22	0.25	0.29	0.36	0.43	0.50	0.58	0.65	
Number of Passes	<b>1</b>	0.18	0.20	0.20	0.25	0.25	0.25	0.30	0.30	0.35	0.35	0.40
	<b>2</b>	0.13	0.15	0.18	0.20	0.20	0.25	0.25	0.25	0.30	0.30	0.35
	<b>3</b>	0.10	0.10	0.12	0.15	0.20	0.20	0.20	0.25	0.25	0.25	0.30
	<b>4</b>	0.05	0.10	0.12	0.15	0.15	0.15	0.20	0.20	0.20	0.25	0.25
	<b>5</b>		0.06	0.10	0.10	0.12	0.15	0.15	0.20	0.20	0.25	0.25
	<b>6</b>			0.05	0.07	0.10	0.10	0.10	0.15	0.20	0.20	0.20
	<b>7</b>					0.05	0.08	0.10	0.15	0.15	0.20	0.20
	<b>8</b>						0.05	0.10	0.10	0.15	0.15	0.15
	<b>9</b>							0.08	0.10	0.10	0.15	0.15
	<b>10</b>								0.05	0.09	0.10	0.10
	<b>11</b>									0.05	0.10	0.10
	<b>12</b>										0.05	0.10
	<b>13</b>											0.05
	<b>14</b>											

Note 1) The first pass causes a high load on the cutting edge. In order to avoid damage, keep the depth of cut to 0.4-0.5mm maximum.

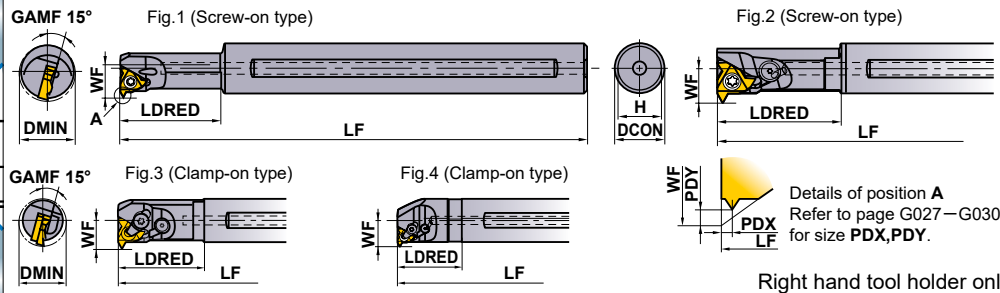
# INTERNAL THREADING

## MMTI TYPE BORING BARS

- Minimum cutting diameter 13mm.
- Various insert types.
- Precision class insert.
- Available with a wiper cutting edge to provide a precise thread geometry.
- Able to change lead angle by replacing the shim.

### MMTI

#### Internal threading



Right hand tool holder only.

Order Number	Stock R	Insert Number	Lead Angle	Dimensions (mm)						Clamp Bridge	Clamp Screw *	Stop Ring	① Shim Screw ② Embedded Seal Screw	Shim	Wrench	Fig
				DCON	LF	LDRED	WF	H	DMIN							
MMTIR1316AK11-SP15	●	MMT111R	1.5°	16	125	25	8.7	15	13	—	TS25	—	—	—	①TKY08F	1
MMTIR1316AK11-SP25	★		2.5°	16	125	25	8.7	15	13	—	TS25	—	—	—	①TKY08F	1
MMTIR1316AK11-SP35	★		3.5°	16	125	25	8.7	15	13	—	TS25	—	—	—	①TKY08F	1
MMTIR1516AM11-SP15	●		1.5°	16	150	32	9.7	15	15	—	TS25	—	—	—	①TKY08F	1
MMTIR1516AM11-SP25	★		2.5°	16	150	32	9.7	15	15	—	TS25	—	—	—	①TKY08F	1
MMTIR1516AM11-SP35	★		3.5°	16	150	32	9.7	15	15	—	TS25	—	—	—	①TKY08F	1
MMTIR1916AM16-SP15	●	MMT161R	1.5°	16	150	40	12.2	15	19	—	CS350860T	—	—	—	①TKY15F	2
MMTIR1916AM16-SP25	★		2.5°	16	150	40	12.2	15	19	—	CS350860T	—	—	—	①TKY15F	2
MMTIR1916AM16-SP35	★		3.5°	16	150	40	12.2	15	19	—	CS350860T	—	—	—	①TKY15F	2
MMTIR2420AQ16-C	●		1.5°	20	180	40	14.2	19	24	SETK51	SETS51	CR4	①HFC03006 ②TFS03006	CTI32TP15	①TKY15F ②HKY20R	3
MMTIR2925AS16-C	●		1.5°	25	250	60	16.7	23.4	29	SETK51	SETS51	CR4	①HFC03006 ②TFS03006	CTI32TP15	①TKY15F ②HKY20R	3
MMTIR3732AS16-C	●		1.5°	32	250	48	20.5	30.4	37	SETK51	SETS51	CR4	①HFC03006 ②TFS03006	CTI32TP15	①TKY15F ②HKY20R	4
MMTIR2420AQ22-SP15	●	MMT221R	1.5°	20	180	50	15.5	19	24	—	TS43	—	—	—	①TKY15F	2
MMTIR2420AQ22-SP25	★		2.5°	20	180	50	15.5	19	24	—	TS43	—	—	—	①TKY15F	2
MMTIR2420AQ22-SP35	★		3.5°	20	180	50	15.5	19	24	—	TS43	—	—	—	①TKY15F	2
MMTIR3025AR22-C	●		1.5°	25	200	38	17.8	23.4	30	SETK61	SETS61	CR5	①HFC04008 ②TFS03006	CTI43TP15	①TKY20F ②HKY25R	4
MMTIR3832AS22-C	●		1.5°	32	250	48	21.8	30.4	38	SETK61	SETS61	CR5	①HFC04008 ②TFS03006	CTI43TP15	①TKY20F ②HKY25R	4
MMTIR4640AT22-C	★		1.5°	40	300	60	26.2	38	46	SETK61	SETS61	CR5	①HFC04008 ②TFS03006	CTI43TP15	①TKY20F ②HKY25R	4

Note 1) Select and use a shim as shown below (sold separately), dependant on the lead angle.

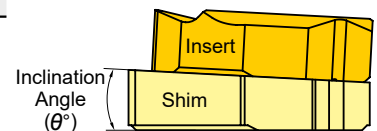
- A screw-on tool holder uses no shim. (The holder body has a lead angle.) Use a tool holder with the appropriate lead angle.
- Min. cutting diameter (DMIN) shows the internal hole diameter, not the thread diameter.

\* Clamp Torque (N · m) : TS25=1.0, CS350860T=3.5, SETS51=3.5, TS43=3.5, SETS61=5.0, HFC03006=1.5, HFC04008=2.2

### SHIM

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder	Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
-1.5°	CTI32TN15	●	-3°	MMTIR ○○○ ○○16-C	-1.5°	CTI43TN15	●	-3°	MMTIR ○○○ ○○22-C
-0.5°	CTI32TN05	●	-2°		-0.5°	CTI43TN05	●	-2°	
0.5°	CTI32TP05	●	-1°		0.5°	CTI43TP05	●	-1°	
1.5°	CTI32TP15	●	0°		1.5°	CTI43TP15	●	0°	
2.5°	CTI32TP25	●	1°		2.5°	CTI43TP25	●	1°	
3.5°	CTI32TP35	●	2°		3.5°	CTI43TP35	●	2°	
4.5°	CTI32TP45	●	3°	4.5°	CTI43TP45	●	3°		

Standard shim delivered with the holder.



### RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Grade	Cutting Speed (m/min)
P Mild Steel	≤180HB	VP10MF	150 (70-230)
		VP15TF	100 (60-140)
		VP20RT	80 (60-100)
Carbon Steel Alloy Steel	180-280HB	VP10MF	140 (80-200)
		VP15TF	100 (60-140)
		VP20RT	80 (60-100)
M Stainless Steel	≤200HB	VP15TF VP20RT	80 (40-120)
K Gray Cast Iron	Tensile Strength ≤350MPa	VP10MF	140 (80-200)
		VP15TF	90 (60-120)

Work Material	Hardness	Grade	Cutting Speed (m/min)
S Heat-Resistant Alloy	—	VP10MF	45 (15-70)
		VP15TF	30 (20-40)
		VP20RT	—
Titanium Alloy	—	VP10MF	60 (40-80)
		VP15TF	45 (25-65)
		VP20RT	—
H Heat-Treated Alloy	45-55HRC	VP10MF	50 (30-70)
		VP15TF	40 (20-60)

● : Inventory maintained. ★ : Inventory maintained in Japan.  
(5 inserts in one case)

HOW TO SELECT A SHIM > G012  
MMT SERIES ORDER NUMBER > G018

# MMT M-CLASS INSERTS WITH 3-D CHIPBREAKERS

## INSERTS

Type	Order Number	Coated		Pitch		Dimensions (mm)					Total Cutting Depth (mm)	Geometry
		VP15TF	VP20RT	mm	thread/inch	IC	S	PDY	PDX	RE		
Partial Profile 60°	MMT11IRA60-S	●		0.5-1.5	48-16	6.35	3.04	0.8	0.9	0.03	—	
	MMT16IRA60-S	●		0.5-1.5	48-16	9.525	3.44	0.8	0.9	0.03	—	
	MMT16IRG60-S	●		1.75-3.0	14-8	9.525	3.44	1.2	1.7	0.11	—	
Partial Profile 55°	MMT11IRA55-S	●			48-16	6.35	3.04	0.8	0.9	0.07	—	
	MMT16IRA55-S	●			48-16	9.525	3.44	0.8	0.9	0.07	—	
	MMT16IRG55-S	●			14-8	9.525	3.44	1.2	1.7	0.21	—	
ISO Metric	MMT11IR100ISO-S	●		1.0		6.35	3.04	0.6	0.7	0.06	0.58	
	MMT11IR125ISO-S	●		1.25		6.35	3.04	0.8	0.9	0.08	0.72	
	MMT11IR150ISO-S	●		1.5		6.35	3.04	0.8	1.0	0.10	0.87	
	MMT16IR100ISO-S	●	●	1.0		9.525	3.44	0.6	0.7	0.06	0.58	
	MMT16IR125ISO-S	●	●	1.25		9.525	3.44	0.8	0.9	0.08	0.72	
	MMT16IR150ISO-S	●	●	1.5		9.525	3.44	0.8	1.0	0.10	0.87	
	MMT16IR175ISO-S	●	●	1.75		9.525	3.44	0.9	1.2	0.11	1.01	
	MMT16IR200ISO-S	●	●	2.0		9.525	3.44	1.0	1.3	0.13	1.15	
	MMT16IR250ISO-S	●	●	2.5		9.525	3.44	1.1	1.5	0.17	1.44	
	MMT16IR300ISO-S	●	●	3.0		9.525	3.44	1.1	1.5	0.20	1.73	
American UN	MMT16IR160UN-S	●			16	9.525	3.44	0.9	1.1	0.11	0.92	
	MMT16IR140UN-S	●			14	9.525	3.44	0.9	1.2	0.12	1.05	
	MMT16IR120UN-S	●			12	9.525	3.44	1.1	1.4	0.14	1.22	
Whitworth for BSW, BSP	MMT16IR190W-S	●			19	9.525	3.44	0.8	1.0	0.18	0.86	
	MMT16IR140W-S	●			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT16IR110W-S	●			11	9.525	3.44	1.1	1.5	0.32	1.48	
BSPT	MMT16IR190BSPT-S	●			19	9.525	3.44	0.8	0.9	0.18	0.86	
	MMT16IR140BSPT-S	●			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT16IR110BSPT-S	●			11	9.525	3.44	1.1	1.5	0.32	1.48	



THREADING

## IDENTIFICATION

<b>MMT</b>	<b>16</b>	<b>I</b>	<b>R</b>	<b>100</b>	<b>ISO</b>	<b>-</b>	<b>S</b>	M-class inserts with 3-D chipbreakers
<b>Designation</b>	<b>Diameter of Inscribed Circle (mm)</b>	<b>Application</b>	<b>Hand of Tool</b>	<b>Pitch</b>		<b>Threading Type</b>		
	11 6.35 16 9.525	E External I Internal	R Right	100 1.0mm 125 1.25mm 150 1.5mm 175 1.75mm 200 2.0mm 250 2.5mm 300 3.0mm	A 0.5-1.5mm or 48-16 thread/inch G 1.75-3.0mm or 14-8 thread/inch	60 Partial Profile 60° 55 Partial Profile 55° ISO ISO Metric W Whitworth for BSW, BSP BSPT BSPT UN American UN		

# INTERNAL THREADING

# MMT G-CLASS GROUND INSERTS

## INSERTS

Type	Thread Tolerance	Order Number	Coated		Pitch		Dimensions (mm)					Total Cutting Depth (mm)	Geometry
			VP10MF	VP15TF	mm	thread/inch	IC	S	PDY	PDX	RE		
Partial Profile 60°	—	MMT11IRA60	●	●	0.5—1.5	48—16	6.35	3.04	0.8	0.9	0.05	—	
		MMT16IRA60	●	●	0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.05	—	
		MMT16IRG60	●	●	1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.16	—	
		MMT16IRAG60	●	●	0.5—3.0	48—8	9.525	3.44	1.2	1.7	0.05	—	
		MMT22IRN60	●	●	3.5—5.0	7—5	12.7	4.64	1.7	2.5	0.30	—	
Partial Profile 55°	—	MMT11IRA55	●	●		48—16	6.35	3.04	0.8	0.9	0.05	—	
		MMT16IRA55	●	●		48—16	9.525	3.44	0.8	0.9	0.05	—	
		MMT16IRG55	●	●		14—8	9.525	3.44	1.2	1.7	0.21	—	
		MMT16IRAG55	●	●		48—8	9.525	3.44	1.2	1.7	0.07	—	
		MMT22IRN55	●	●		7—5	12.7	4.64	1.7	2.5	0.44	—	
ISO Metric	6H	MMT11IR050ISO	●	●	0.5		6.35	3.04	0.6	0.4	0.03	0.29	
		MMT11IR075ISO	●	●	0.75		6.35	3.04	0.6	0.6	0.04	0.43	
		MMT11IR100ISO	●	●	1.0		6.35	3.04	0.6	0.7	0.10	0.58	
		MMT11IR125ISO	●	●	1.25		6.35	3.04	0.8	0.9	0.12	0.72	
		MMT11IR150ISO	●	●	1.5		6.35	3.04	0.8	1.0	0.14	0.87	
		MMT11IR175ISO	●	●	1.75		6.35	3.04	0.9	1.1	0.10	1.01	
		MMT11IR200ISO	●	●	2.0		6.35	3.04	0.9	1.1	0.18	1.15	
		MMT16IR050ISO	●	●	0.5		9.525	3.44	0.6	0.4	0.03	0.29	
		MMT16IR075ISO	●	●	0.75		9.525	3.44	0.6	0.6	0.04	0.43	
		MMT16IR100ISO	●	●	1.0		9.525	3.44	0.6	0.7	0.10	0.58	
		MMT16IR125ISO	●	●	1.25		9.525	3.44	0.8	0.9	0.12	0.72	
		MMT16IR150ISO	●	●	1.5		9.525	3.44	0.8	1.0	0.14	0.87	
		MMT16IR175ISO	●	●	1.75		9.525	3.44	0.9	1.2	0.10	1.01	
		MMT16IR200ISO	●	●	2.0		9.525	3.44	1.0	1.3	0.18	1.15	
		MMT16IR250ISO	●	●	2.5		9.525	3.44	1.1	1.5	0.15	1.44	
		MMT16IR300ISO	●	●	3.0		9.525	3.44	1.1	1.5	0.26	1.73	
		MMT22IR350ISO	●	●	3.5		12.7	4.64	1.6	2.3	0.22	2.02	
		MMT22IR400ISO	●	●	4.0		12.7	4.64	1.6	2.3	0.25	2.31	
		MMT22IR450ISO	●	●	4.5		12.7	4.64	1.6	2.4	0.28	2.60	
		MMT22IR500ISO	●	●	5.0		12.7	4.64	1.6	2.3	0.32	2.89	

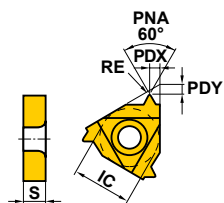
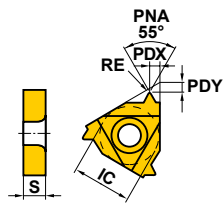
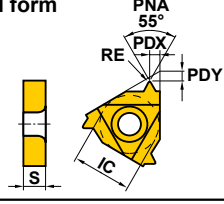
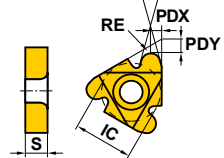
G  
THREADING

## IDENTIFICATION

<b>MMT</b>	<b>16</b>	<b>I</b>	<b>R</b>	<b>050</b>	<b>ISO</b>																																																																
Designation	Diameter of Inscribed Circle (mm)	Application	Hand of Tool	Pitch	Threading Type																																																																
	11 6.35 16 9.525 22 12.7	E External I Internal	R Right	<table border="1"> <tr> <td>050</td> <td>0.5mm</td> <td rowspan="2">A</td> <td rowspan="2">0.5—1.5mm or 48—16 thread/inch</td> </tr> <tr> <td>075</td> <td>0.75mm</td> </tr> <tr> <td>100</td> <td>1.0mm</td> <td rowspan="3">G</td> <td rowspan="3">1.75—3.0mm or 14—8 thread/inch</td> </tr> <tr> <td>125</td> <td>1.25mm</td> </tr> <tr> <td>150</td> <td>1.5mm</td> </tr> <tr> <td>175</td> <td>1.75mm</td> <td rowspan="4">AG</td> <td rowspan="4">0.5—3.0mm or 48—8 thread/inch</td> </tr> <tr> <td>200</td> <td>2.0mm</td> </tr> <tr> <td>250</td> <td>2.5mm</td> </tr> <tr> <td>300</td> <td>3.0mm</td> </tr> <tr> <td>350</td> <td>3.5mm</td> <td rowspan="3">N</td> <td rowspan="3">3.5—5.0mm or 7—5 thread/inch</td> </tr> <tr> <td>400</td> <td>4.0mm</td> </tr> <tr> <td>450</td> <td>4.5mm</td> </tr> <tr> <td>500</td> <td>5.0mm</td> <td></td> <td></td> </tr> </table>	050	0.5mm	A	0.5—1.5mm or 48—16 thread/inch	075	0.75mm	100	1.0mm	G	1.75—3.0mm or 14—8 thread/inch	125	1.25mm	150	1.5mm	175	1.75mm	AG	0.5—3.0mm or 48—8 thread/inch	200	2.0mm	250	2.5mm	300	3.0mm	350	3.5mm	N	3.5—5.0mm or 7—5 thread/inch	400	4.0mm	450	4.5mm	500	5.0mm			<table border="1"> <tr> <td>60</td> <td>Partial Profile 60°</td> </tr> <tr> <td>55</td> <td>Partial Profile 55°</td> </tr> <tr> <td>ISO</td> <td>ISO Metric</td> </tr> <tr> <td>W</td> <td>Whitworth for BSW, BSP</td> </tr> <tr> <td>BSPT</td> <td>BSPT</td> </tr> <tr> <td>UN</td> <td>American UN</td> </tr> <tr> <td>RD</td> <td>Round DIN 405</td> </tr> <tr> <td>TR</td> <td>ISO Trapezoidal 30°</td> </tr> <tr> <td>ACME</td> <td>American ACME</td> </tr> <tr> <td>UNJ</td> <td>UNJ</td> </tr> <tr> <td>APBU</td> <td>API Buttress Casing</td> </tr> <tr> <td>APRD</td> <td>API Round Casing&amp;Tubing</td> </tr> <tr> <td>NPT</td> <td>NPT</td> </tr> <tr> <td>NPTF</td> <td>NPTF</td> </tr> </table>	60	Partial Profile 60°	55	Partial Profile 55°	ISO	ISO Metric	W	Whitworth for BSW, BSP	BSPT	BSPT	UN	American UN	RD	Round DIN 405	TR	ISO Trapezoidal 30°	ACME	American ACME	UNJ	UNJ	APBU	API Buttress Casing	APRD	API Round Casing&Tubing	NPT	NPT	NPTF	NPTF
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● : Inventory maintained. ★ : Inventory maintained in Japan.  
(5 inserts in one case)

# INSERTS

Type	Thread Tolerance	Order Number	Coated		Pitch		Dimensions (mm)					Total Cutting Depth (mm)	Geometry
			VP10MF	VP15TF	mm	thread/inch	IC	S	PDY	PDX	RE		
American UN	2B	MMT11IR320UN	★			32	6.35	3.04	0.6	0.6	0.04	0.46	Full form 
		MMT11IR280UN	★			28	6.35	3.04	0.6	0.7	0.05	0.52	
		MMT11IR240UN	●			24	6.35	3.04	0.7	0.8	0.09	0.61	
		MMT11IR200UN	●			20	6.35	3.04	0.8	0.9	0.11	0.73	
		MMT11IR180UN	●			18	6.35	3.04	0.8	1.0	0.12	0.81	
		MMT11IR160UN	●			16	6.35	3.04	0.9	1.1	0.14	0.92	
		MMT11IR140UN	●			14	6.35	3.04	0.9	1.1	0.11	1.05	
		MMT16IR320UN	●			32	9.525	3.44	0.6	0.6	0.04	0.46	
		MMT16IR280UN	●			28	9.525	3.44	0.6	0.7	0.05	0.52	
		MMT16IR240UN	●			24	9.525	3.44	0.7	0.8	0.09	0.61	
		MMT16IR200UN	●			20	9.525	3.44	0.8	0.9	0.11	0.73	
		MMT16IR180UN	●			18	9.525	3.44	0.8	1.0	0.12	0.81	
		MMT16IR160UN	● ●			16	9.525	3.44	0.9	1.1	0.14	0.92	
		MMT16IR140UN	● ●			14	9.525	3.44	0.9	1.2	0.11	1.05	
		MMT16IR130UN	● ●			13	9.525	3.44	1.0	1.3	0.10	1.13	
		MMT16IR120UN	● ●			12	9.525	3.44	1.1	1.4	0.18	1.22	
		MMT16IR110UN	●			11	9.525	3.44	1.1	1.5	0.13	1.33	
		MMT16IR100UN	●			10	9.525	3.44	1.1	1.5	0.15	1.47	
		MMT16IR090UN	●			9	9.525	3.44	1.2	1.7	0.17	1.63	
		MMT16IR080UN	●			8	9.525	3.44	1.1	1.5	0.27	1.83	
MMT22IR070UN	●			7	12.7	4.64	1.6	2.3	0.23	2.09			
MMT22IR060UN	●			6	12.7	4.64	1.6	2.3	0.26	2.44			
MMT22IR050UN	●			5	12.7	4.64	1.6	2.3	0.32	2.93			
Whitworth for BSW, BSP	Medium Class A	MMT11IR190W	●			19	6.35	3.04	0.8	1.0	0.19	0.86	Full form 
		MMT11IR140W	●			14	6.35	3.04	0.9	1.1	0.26	1.16	
		MMT16IR280W	●			28	9.525	3.44	0.6	0.7	0.09	0.58	
		MMT16IR260W	●			26	9.525	3.44	0.7	0.8	0.10	0.63	
		MMT16IR200W	●			20	9.525	3.44	0.8	0.9	0.18	0.81	
		MMT16IR190W	● ●			19	9.525	3.44	0.8	1.0	0.19	0.86	
		MMT16IR180W	●			18	9.525	3.44	0.8	1.0	0.20	0.90	
		MMT16IR160W	●			16	9.525	3.44	0.9	1.1	0.23	1.02	
		MMT16IR140W	● ●			14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT16IR120W	● ●			12	9.525	3.44	1.1	1.4	0.30	1.36	
		MMT16IR110W	● ●			11	9.525	3.44	1.1	1.5	0.33	1.48	
		MMT16IR100W	●			10	9.525	3.44	1.1	1.5	0.37	1.63	
		MMT16IR090W	●			9	9.525	3.44	1.2	1.7	0.34	1.81	
		MMT16IR080W	●			8	9.525	3.44	1.2	1.5	0.39	2.03	
		MMT22IR070W	●			7	12.7	4.64	1.6	2.3	0.46	2.32	
		MMT22IR060W	●			6	12.7	4.64	1.6	2.3	0.53	2.71	
MMT22IR050W	●			5	12.7	4.64	1.7	2.4	0.66	3.25			
BSPT	Standard BSPT	MMT11IR190BSPT	●			19	6.35	3.04	0.8	0.9	0.14	0.86	Full form 
		MMT11IR140BSPT	●			14	6.35	3.04	0.9	1.0	0.26	1.16	
		MMT16IR190BSPT	★ ★			19	9.525	3.44	0.8	0.9	0.14	0.86	
		MMT16IR140BSPT	★ ★			14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT16IR110BSPT	★ ★			11	9.525	3.44	1.1	1.5	0.33	1.48	
Round DIN 405	7H	MMT16IR100RD	●			10	9.525	3.44	1.1	1.2	0.55	1.27	Full form 
		MMT16IR080RD	●			8	9.525	3.44	1.4	1.4	0.70	1.59	
		MMT16IR060RD	●			6	9.525	3.44	1.4	1.5	0.93	2.12	
		MMT22IR040RD	●			4	12.7	4.64	2.2	2.3	1.40	3.18	

G

THREADING

# INTERNAL THREADING

# MMT G-CLASS GROUND INSERTS

## INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Pitch		Dimensions (mm)					Total Cutting Depth (mm)	Geometry
				mm	thread/inch	IC	S	PDY	PDX	RE		
ISO Trapezoidal 30°	7H	MMT16IR150TR	●	1.5		9.525	3.44	1.0	1.1	0.08	0.90	
		MMT16IR200TR	●	2.0		9.525	3.44	1.1	1.3	0.15	1.25	
		MMT16IR300TR	●	3.0		9.525	3.44	1.3	1.5	0.15	1.75	
		MMT22IR400TR	●	4.0		12.7	4.64	1.7	1.9	0.15	2.25	
		MMT22IR500TR	●	5.0		12.7	4.64	2.1	2.5	0.15	2.75	
American ACME	3G	MMT16IR120ACME	●		12	9.525	3.44	1.2	1.3	0.05	1.19	
		MMT16IR100ACME	●		10	9.525	3.44	1.2	1.3	0.08	1.52	
		MMT16IR080ACME	●		8	9.525	3.44	1.4	1.5	0.10	1.84	
		MMT22IR060ACME	●		6	12.7	4.64	1.8	2.1	0.10	2.37	
		MMT22IR050ACME	●		5	12.7	4.64	2.0	2.3	0.10	2.79	
UNJ		When machining an internal UNJ thread, cut an internal hole with the appropriate diameter. Then machine with 60° American UN. In this case, a full form type insert cannot be used.										
API Buttress Casing	Standard API	MMT22IR050APBU	●		5	12.7	4.64	2.8	1.9	0.18	1.55	
API Round Casing & Tubing	Standard API RD	MMT16IR100APRD	●		10	9.525	3.44	1.2	1.4	0.34	1.41	
		MMT16IR080APRD	●		8	9.525	3.44	1.3	1.5	0.41	1.81	
American NPT	Standard NPT	MMT16IR270NPT	★		27	9.525	3.44	0.7	0.8	0.04	0.66	
		MMT16IR180NPT	★		18	9.525	3.44	0.8	1.0	0.08	1.01	
		MMT16IR140NPT	●		14	9.525	3.44	0.9	1.2	0.09	1.33	
		MMT16IR115NPT	●		11.5	9.525	3.44	1.1	1.5	0.11	1.64	
		MMT16IR080NPT	●		8	9.525	3.44	1.3	1.8	0.14	2.42	
American NPTF	Class 2	MMT16IR140NPTF	★		14	9.525	3.44	0.9	1.2	0.04	1.35	
		MMT16IR115NPTF	★		11.5	9.525	3.44	1.1	1.5	0.04	1.63	
		MMT16IR080NPTF	★		8	9.525	3.44	1.3	1.8	0.04	2.38	

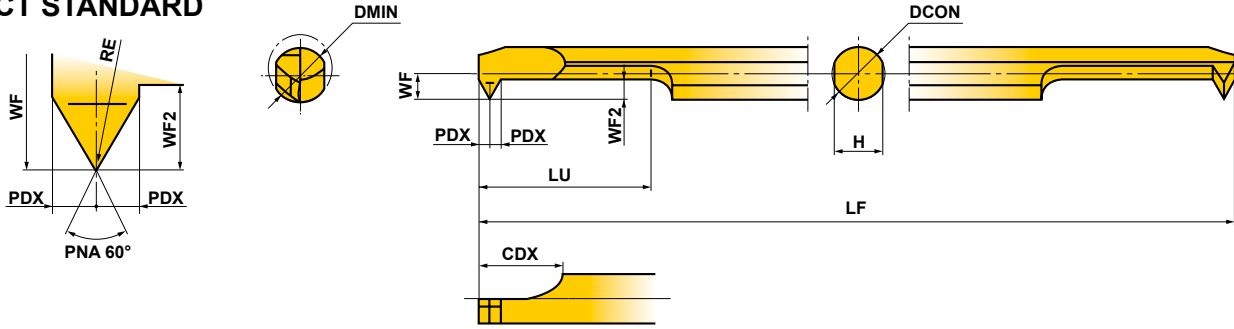
G THREADING

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● : Inventory maintained. ★ : Inventory maintained in Japan.  
(5 inserts in one case)

# MICRO-MINI TWIN

## CT STANDARD



Order Number	Stock		Breaker	Threads				Dimensions (mm)									
	Micro Grain Carbide	Coated		Metric Screw		Unified Coarse Screw		DMIN	RE	DCON	LF	LU	CDX	WF	PDX	WF2	H
				Thread	Pitch (mm)	Thread	Pitch (thread/inch)										
	TF15	VP15TF															
CT0305RS-M4	★	★	Without	≥ M4	0.5-1.0	≥ NO.8-32UNC ≥ NO.8-36UNF	36-24	3	0.03	3	50	5.2	6	1.3	0.6	1.2	2.7
CT03RS-M4	●	●	Without	≥ M4	0.5-1.0		36-24	3	0.03	3	50	10.2	6	1.3	0.6	1.2	2.7
CT03RS-M4B	●	●	With	≥ M4	0.5-1.0		36-24	3	0.03	3	50	10.2	6	1.3	0.6	1.2	2.7
CT0407RS-M6	★	★	Without	≥ M6	0.75-1.25	≥ 1/4-20UNC ≥ 1/4-28UNF	28-20	4.5	0.05	4	60	7.6	7	1.8	0.8	1.7	3.6
CT04RS-M6	●	●	Without	≥ M6	0.75-1.25		28-20	4.5	0.05	4	60	15.6	7	1.8	0.8	1.7	3.6
CT04RS-M6B	●	●	With	≥ M6	0.75-1.25		28-20	4.5	0.05	4	60	15.6	7	1.8	0.8	1.7	3.6
CT0511RS-M8	★	★	Without	≥ M8	0.75-1.5	≥ 5/16-18UNC ≥ 5/16-24UNF	24-18	6	0.05	5	70	11	8	2.3	1	2.2	4.5
CT05RS-M8	●	●	Without	≥ M8	0.75-1.5		24-18	6	0.05	5	70	21	8	2.3	1	2.2	4.5
CT05RS-M8B	●	●	With	≥ M8	0.75-1.5		24-18	6	0.05	5	70	21	8	2.3	1	2.2	4.5
CT0611RS-M10	★	★	Without	≥ M10	0.75-1.75	≥ 3/8-16UNC ≥ 3/8-24UNF	24-16	7	0.05	6	75	11	8	2.8	1	2.2	5.4
CT06RS-M10	●	●	Without	≥ M10	0.75-1.75		24-16	7	0.05	6	75	21	8	2.8	1	2.2	5.4
CT06RS-M10B	●	●	With	≥ M10	0.75-1.75		24-16	7	0.05	6	75	21	8	2.8	1	2.2	5.4

## RECOMMENDED CUTTING CONDITIONS

Work Material	Cutting Speed (m/min)	Recommended Tool Overhang (mm)
P Carbon Steel Alloy Steel	50 (30-80)	
M Stainless Steel	50 (30-80)	
K Cast Iron	50 (30-80)	
N Non-Ferrous Metal	80 (50-100)	

(Note 1) Wet cutting is recommended.

(Note 2) Pay special attention to machining of small diameters at high revolutions as the feed rate cannot keep up with the speed.

## STANDARD OF DEPTH OF CUT

● The chart on the right shows the cutting depths when machining external ISO metric screw threads.

## Metric

P(Pitch)	0.50	0.75	1.00	1.25	1.50	1.75
Total Cutting Depth	0.29	0.43	0.58	0.72	0.87	1.01
Number of Passes	1	0.06	0.06	0.07	0.07	0.07
	2	0.05	0.06	0.06	0.07	0.07
	3	0.05	0.05	0.06	0.07	0.07
	4	0.04	0.05	0.05	0.07	0.07
	5	0.03	0.04	0.05	0.06	0.06
	6	0.03	0.04	0.05	0.06	0.06
	7	0.02	0.04	0.04	0.05	0.06
	8	0.01	0.03	0.04	0.05	0.06
	9	-	0.03	0.04	0.05	0.05
	10	-	0.02	0.03	0.04	0.05
	11	-	0.01	0.03	0.04	0.05
	12	-	-	0.03	0.03	0.04
	13	-	-	0.02	0.03	0.04
	14	-	-	0.01	0.02	0.03
	15	-	-	-	0.01	0.03
	16	-	-	-	-	0.03
	17	-	-	-	-	0.02
	18	-	-	-	-	0.01
	19	-	-	-	-	-
	20	-	-	-	-	-
	21	-	-	-	-	-

● : Inventory maintained. ★ : Inventory maintained in Japan.  
(MICRO-MINI TWIN is available in 1 piece in one pack.)

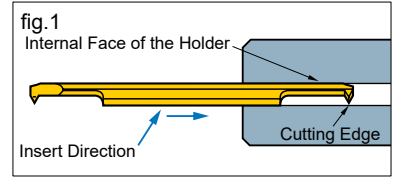
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TECHNICAL DATA > P001

# INTERNAL THREADING

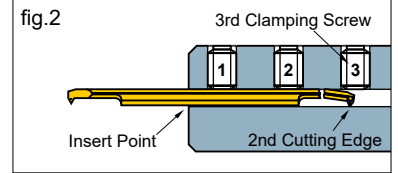
## PRECAUTIONS WHEN USING THE MICRO-MINI TWIN

● When using a holder for general purpose / small automatic lathe:

① To avoid chipping of the 2nd cutting edge take care when inserting the boring bar into the holder. Refer to fig.1. If the 2nd edge contacts the internal face of the holder there is a possibility that it may chip.



② When using this type of holder, there is a possibility that damage to the shank and the 2nd cutting edge can occur. Make sure that the clamping screws are tightened to the set torque value. Additionally make sure that there is no clamping screw near the 2nd cutting edge as this can break the boring bar.

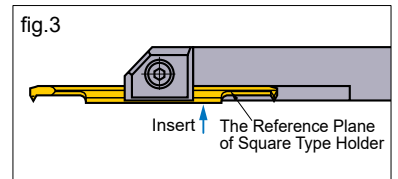


◎ When using Mitsubishi holders

When using holders with a tool overhang of recommended quantity, ensure that the 3rd clamping screw is removed prior to machining. The set torque value for the clamping screw is 2.0 N · m.

● When using a square type holder:

① When installing the boring bar into the holder, tighten the clamp screws after ensuring the flats on the tool holder are parallel to the reference flats on the micro-mini bar. Refer to fig.3.



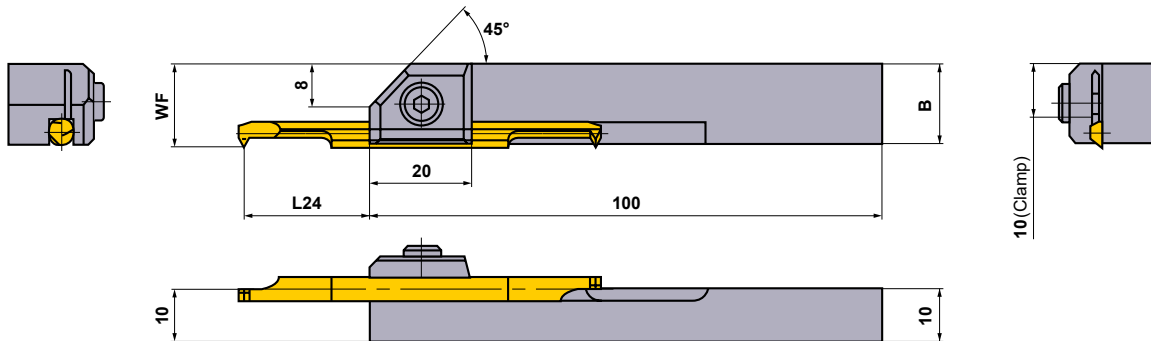
② Make sure that the clamping screws are tightened to the recommended values.

③ Do not tighten the clamp screw without a bar in place, otherwise the bridge will be deformed.

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## SQUARE TYPE HOLDER

THREADING

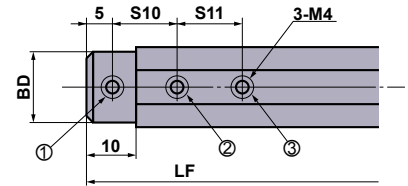
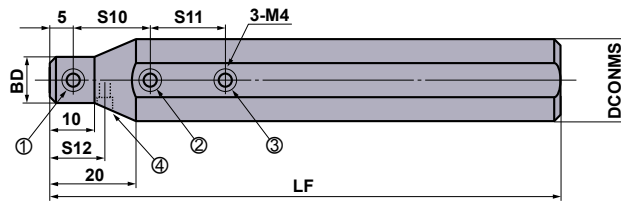
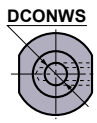


Order Number	Stock	Dimensions (mm)			Micro-Mini Twin CT	Clamp Screw	Wrench	Torque (N·m)
		Micro-Mini Twin CT						
		B	WF	L24 *				
SBH1030R	★	13.8	13.8	13—17.5(14)	0305RS-M4, 03RS-M4(B)	HSC05012	HKY40R	9.5
SBH1040R	★	14.7	14.8	18.5—22(19.5)	0407RS-M6, 04RS-M6(B)	HSC05012	HKY40R	9.5
SBH1050R	★	15.6	15.8	24—26.5(25)	0511RS-M8, 05RS-M8(B)	HSC05012	HKY40R	9.5
SBH1060R	★	16.5	16.8	24—31.5(25)	0611RS-M10, 06RS-M10(B)	HSC05012	HKY40R	9.5

\* L24 is the length of overhang for sufficient clamping, and ( ) is the recommended length for machining of carbon and alloy steel.



# ROUND TYPE HOLDER



RBH2200N has a temporary set screw for different machine specifications.  
(Represented by number 4)

RBH1580N, RBH1600N,  
RBH1900N

Order Number	Stock	Dimensions (mm)						Micro-Mini Twin CT	*1 Clamp Screw				Wrench	Torque (N·m)	
		DCONMS	DCONWS	BD	LF	S10	S11		S12	①	②	③			④
RBH15830N	★	15.875	3	15	100	10	10	—	0305RS-M4, 03RS-M4(B)	A	A	A	—	HKY20F	2.0
RBH15840N	★	15.875	4	15	100	15	15	—	0407RS-M6, 04RS-M6(B)	A	A	A	—	HKY20F	2.0
RBH15850N	★	15.875	5	15	100	15	15	—	0511RS-M8, 05RS-M8(B)	A	A	A	—	HKY20F	2.0
RBH15860N	★	15.875	6	15	100	15	15	—	0611RS-M10, 06RS-M10(B)	A	A	A	—	HKY20F	2.0
RBH1630N	●	16	3	15	100	10	10	—	0305RS-M4, 03RS-M4(B)	A	A	A	—	HKY20F	2.0
RBH1640N	●	16	4	15	100	15	15	—	0407RS-M6, 04RS-M6(B)	A	A	A	—	HKY20F	2.0
RBH1650N	●	16	5	15	100	15	15	—	0511RS-M8, 05RS-M8(B)	A	A	A	—	HKY20F	2.0
RBH1660N	●	16	6	15	100	15	15	—	0611RS-M10, 06RS-M10(B)	A	A	A	—	HKY20F	2.0
*2 RBH19030N	★	19.05	3	18	125	10	10	—	0305RS-M4, 03RS-M4(B)	B	B	B	—	HKY20F	2.0
*2 RBH19040N	★	19.05	4	18	125	15	15	—	0407RS-M6, 04RS-M6(B)	B	B	B	—	HKY20F	2.0
*2 RBH19050N	★	19.05	5	18	125	15	15	—	0511RS-M8, 05RS-M8(B)	B	B	B	—	HKY20F	2.0
*2 RBH19060N	★	19.05	6	18	125	15	15	—	0611RS-M10, 06RS-M10(B)	B	B	B	—	HKY20F	2.0
RBH2030N	★	20	3	12	125	10	10	—	0305RS-M4, 03RS-M4(B)	A	A	B	—	HKY20F	2.0
RBH2040N	★	20	4	13	125	15	15	—	0407RS-M6, 04RS-M6(B)	A	B	B	—	HKY20F	2.0
RBH2050N	★	20	5	14	125	15	15	—	0511RS-M8, 05RS-M8(B)	A	B	B	—	HKY20F	2.0
RBH2060N	★	20	6	15	125	15	15	—	0611RS-M10, 06RS-M10(B)	A	B	B	—	HKY20F	2.0
RBH2230N	★	22	3	12	125	10	10	10	0305RS-M4, 03RS-M4(B)	A	B	C	A	HKY20F	2.0
RBH2240N	★	22	4	13	125	15	15	12.5	0407RS-M6, 04RS-M6(B)	A	B	B	A	HKY20F	2.0
RBH2250N	★	22	5	14	125	15	15	12.5	0511RS-M8, 05RS-M8(B)	A	B	B	A	HKY20F	2.0
RBH2260N	★	22	6	15	125	15	15	15	0611RS-M10, 06RS-M10(B)	A	B	B	A	HKY20F	2.0
RBH2530N	★	25	3	12	150	10	10	—	0305RS-M4, 03RS-M4(B)	A	B	C	—	HKY20F	2.0
RBH2540N	★	25	4	13	150	15	15	—	0407RS-M6, 04RS-M6(B)	A	C	C	—	HKY20F	2.0
RBH2550N	★	25	5	14	150	15	15	—	0511RS-M8, 05RS-M8(B)	A	C	C	—	HKY20F	2.0
RBH2560N	★	25	6	15	150	15	15	—	0611RS-M10, 06RS-M10(B)	A	C	C	—	HKY20F	2.0
RBH25430N	★	25.4	3	12	150	10	10	—	0305RS-M4, 03RS-M4(B)	A	B	C	—	HKY20F	2.0
RBH25440N	★	25.4	4	13	150	15	15	—	0407RS-M6, 04RS-M6(B)	A	C	C	—	HKY20F	2.0
RBH25450N	★	25.4	5	14	150	15	15	—	0511RS-M8, 05RS-M8(B)	A	C	C	—	HKY20F	2.0
RBH25460N	★	25.4	6	15	150	15	15	—	0611RS-M10, 06RS-M10(B)	A	C	C	—	HKY20F	2.0

\*1 Order number of clamp screw A=HSS04004, B=HSS04006, C=HSS04008

\*2 Revised order number.

Conventional Order Number	Revised Order Number
RBH1930N	RBH19030N
RBH1940N	RBH19040N
RBH1950N	RBH19050N
RBH1960N	RBH19060N

● : Inventory maintained. ★ : Inventory maintained in Japan.

SPARE PARTS > N001  
TECHNICAL DATA > P001

# Memo

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# Memo

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A series of horizontal dashed lines for writing, spanning the width of the page.

# HOW TO READ THE STANDARD OF HSK-T TOOLS

## ●How this section page is organised

- ①Organised by product series.  
(Refer to the index on the next page.)

### PRODUCT TYPE

Indicates the first four letters of the order number, as well as cutting applications.

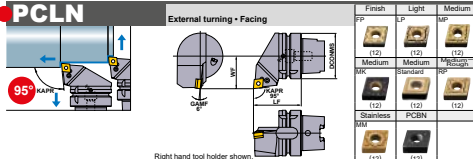
### TITLE OF PRODUCT SERIES

### PRODUCT SECTION

#### ● HSK-T TOOLS

## ● HSK-T SYSTEM

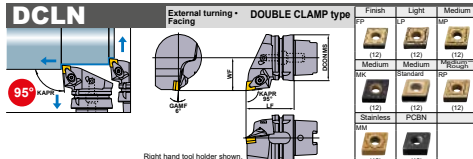
### ● PCLN



Order Number	Stock	Insert Number	Dimensions (mm)		#1	#2	Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench	
			DCOM	LF								
H63TH-PCLNRIL-DX12	●	CN/GA CN/G CN/M	1204	∅3	65	45	1.3	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R

\*1 Clamp Torque (N • m) : LLCS108=3  
\*2 WT : Tool Weight  
Note 1) Dimensions shown for insert corner RE 0.8.

### ● DCLN



Order Number	Stock	Insert Number	Dimensions (mm)		#1	#2	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench	
			DCOM	LF									
H63TH-DCLNRIL-DX12	●	CN/GA CN/G CN/M	1204	∅3	65	45	1.3	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

\*1 Clamp Torque (N • m) : DC0621T=5.0  
\*2 WT : Tool Weight  
Note 1) Dimensions shown for insert corner RE 0.8.

H006 ● Inventory maintained.

PCLN type inserts > A98-A104  
DCLN type inserts > A98-A104  
PCBN & PCD inserts > B036-B038, B064  
RECOMMENDED CUTTING CONDITIONS > A074

**LEGEND FOR STOCK STATUS MARK**  
Is shown on the left hand page of each double-page spread.

**PRODUCT STANDARDS**  
Indicates order numbers, stock status (per right/left hand), applicable inserts, dimensions, and spare parts.

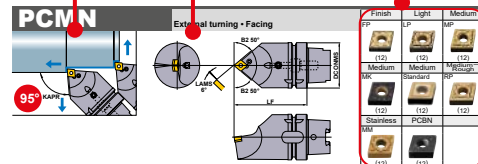
**REFERENCE PAGE FOR APPLICABLE INSERTS**  
Indicates reference pages for details of inserts that are applicable to the product.

**PAGE REFERENCE - SPARE PARTS - TECHNICAL DATA**  
Indicates reference pages, including the above, on the right hand page of each double-page spread.

FIGURE SHOWING THE TOOLING APPLICATION Uses illustrations and arrows to depict available machining applications along with cutting edge lead angles.

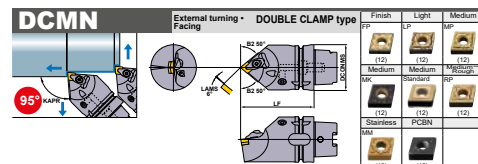
### GEOMETRY

### CHIPBREAKER BY CUTTING APPLICATION



Order Number	Stock	Insert Number	Dimensions (mm)		#1	#2	Shim	Shim Pin	Clamp Lever	Clamp Screw	Plug	Wrench	
			DCOM	LF									
H63TH-PCMNN-H12	●	CN/GA CN/G CN/M	1204	∅3	63	100	1.7	LLSCN42	LLP14	LLCL14	LLCS108	HGM-P118	HKY30R
H63TH-PCMNN-L12	●	CN/GA CN/G CN/M	1204	∅3	63	140	2.7	LLSCN42	LLP14	LLCL14	LLCS108	HGM-P118	HKY30R

\*1 Clamp Torque (N • m) : LLCS108=3  
\*2 WT : Tool Weight  
Note 1) Dimensions shown for insert corner RE 0.8.



Order Number	Stock	Insert Number	Dimensions (mm)		#1	#2	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench	
			DCOM	LF									
H63TH-DCMNN-H12	●	CN/GA CN/G CN/M	1204	∅3	63	100	1.7	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
H63TH-DCMNN-L12	●	CN/GA CN/G CN/M	1204	∅3	63	140	2.7	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

\*1 Clamp Torque (N • m) : DC0621T=5.0  
\*2 WT : Tool Weight  
Note 1) Dimensions shown for insert corner RE 0.8.

PCMN type inserts > A98-A104  
DCMN type inserts > A98-A104  
PCBN & PCD inserts > B036-B038, B064  
RECOMMENDED CUTTING CONDITIONS > A074  
SPARE PARTS > N051  
TECHNICAL DATA > P01

HSK-T TOOLS

HSK-T TOOLS

● To Order : Please specify  
① order number and hand of tool (right/left).

# HSK-T TOOLS

OVERVIEW OF HSK-T TOOLS .....	H002
CLASSIFICATION OF HSK-T TOOLS .....	H004
<b>HSK-T TOOL STANDARDS</b>	
<b>EXTERNAL TURNING • FACING</b>	
CN <sup>○○</sup> INSERTS TOOL HOLDERS .....	H006
DN <sup>○○</sup> INSERTS TOOL HOLDERS .....	H011
<b>EXTERNAL TURNING • FACING • BORING</b>	
CN <sup>○○</sup> INSERTS TOOL HOLDERS .....	H008
<b>EXTERNAL TURNING • COPYING</b>	
DN <sup>○○</sup> INSERTS TOOL HOLDERS .....	H009
<b>EXTERNAL TURNING • FACING • COPYING</b>	
RC <sup>○○</sup> INSERTS TOOL HOLDERS .....	H012
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VB <sup>○○</sup> INSERTS TOOL HOLDERS .....	H013
<b>GROOVING</b>	
MG INSERTS TOOL HOLDERS .....	H014
<b>THREADING</b>	
MMT INSERTS TOOL HOLDERS .....	H016
MT INSERTS TOOL HOLDERS .....	H017
EXTERNAL TURNING TOOL HOLDERS .....	H019
BORING BAR HOLDERS .....	H021
BORING BAR SLEEVES .....	H022

\*Alphabetical order index

H022	H100TH-B <sup>○○○○</sup>	H014	H63TH-MGHR/L-DX43 <sup>○○</sup>
H020	H100TH-EN3232R/L-130	H016	H63TH-MMTER-H/L16
H019	H100TH-EV3232R/L-180	H016	H63TH-MMTER-DX16
H008	H63TH-A <sup>○○○○</sup> DCLNR/L12	H017	H63TH-MTHR/L-DX43
H021	H63TH-B <sup>○○○○</sup>	H006	H63TH-PCLNR/L-DX12
H008	H63TH-DCLNL-L12-3	H007	H63TH-PCMNN-H/L12
H006	H63TH-DCLNR/L-DX12	H009	H63TH-PDJNR/L-DX15
H007	H63TH-DCMNN-H/L12	H010	H63TH-PDNNN-H/L15
H011	H63TH-DDJNL-L15-3	H012	H63TH-PRDCN-H/L12
H009	H63TH-DDJNR/L-DX15	H012	H63TH-PRGCR/L-DX12
H010	H63TH-DDNNN-H/L15	H013	H63TH-SVPBR/L-DX16
H020	H63TH-EN2525R/L-115	H013	H63TH-SVVBH-H/L16
H021	H63TH-EV2020R/L-105-3	H022	SL32 <sup>○○</sup> -90
H019	H63TH-EV2525R/L-112		



Tooling system  
for turning on  
multi-task machines

# HSK TOOLS

## HSK-T System

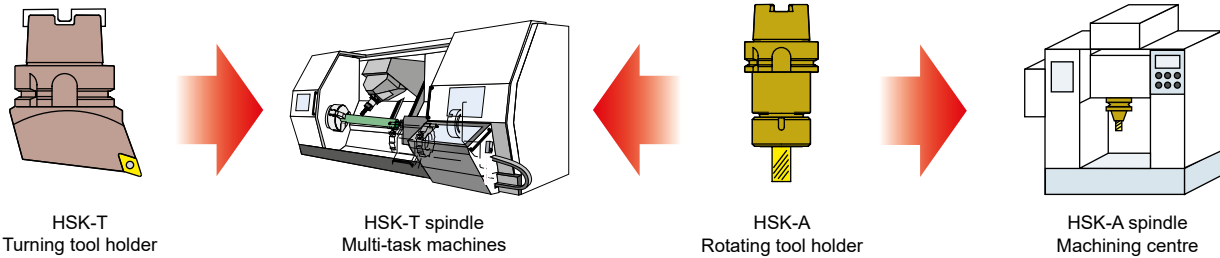
HSK-T is a new type of HSK system designed for turning on multi-task machines that are compatible with HSK-A type (ISO standard: ISO12164-1:2001). The HSK system was developed by a consortium of 17 Japanese manufacturers and registered in ISO standard (ISO12164-3:2008) under the name HSK-T type in 2008 and JIS standard (JIS B6064-3) in 2013.



## High accuracy cutting edge positioning

The HSK-T type has a closer tolerance between the spindle key and tool holder keyway than the HSK-A type. This results in higher cutting edge positional accuracy. For milling, the conventional HSK-A type tools can be still used.

## Compatible with both multi-task machines and machining centres



HSK-T  
Turning tool holder

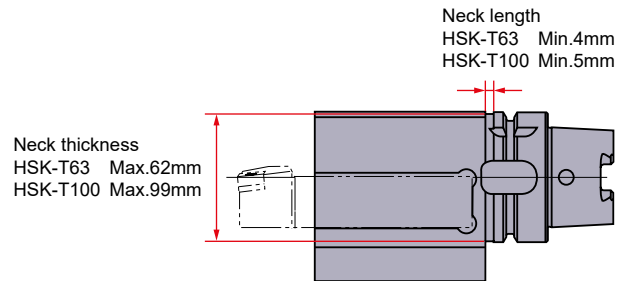
HSK-T spindle  
Multi-task machines

HSK-A  
Rotating tool holder

HSK-A spindle  
Machining centre

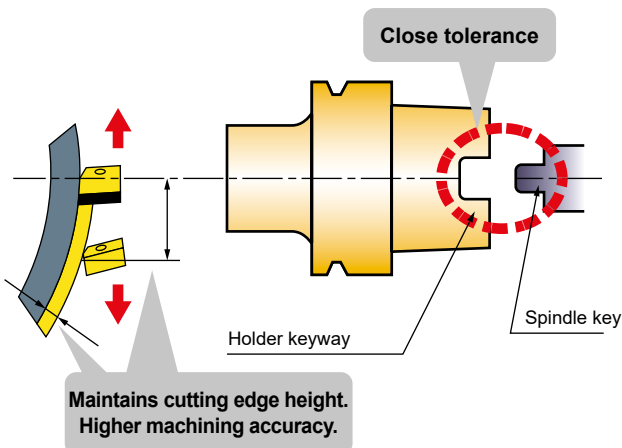
HSK-T TOOLS

**\*Note**  
Short neck length from the flange with thick body of the HSK-T turning tool as shown in the figure at the left. Because there are machines which cannot be mounted depending on the ATC specifications of the multi-task machine (HSK-A type), please check beforehand. Also be careful of interference in the magazine with adjacent tools.



HSK-T turning tool standard (Example)

## Improved keyway tolerance



Tolerance comparison (Example) (mm)

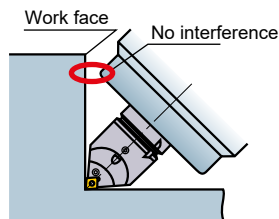
	12.2	12.3	12.4	12.5	12.6
<b>HSK A63</b>		12.25	12.35	12.58	
		Key tolerance 0.10			
		Minimum clearance 0.15			
			0.08		
			12.5		
		Maximum clearance 0.33			
<b>HSK T63</b>		12.385	12.41	12.46	
		Minimum clearance 0.015			
			0.025		
			0.035		
			12.425		
			0.075		
			Maximum clearance		

# High accuracy and rigidity HSK-T type tooling system developed for use on multi-task machines.

## Straight type tools suitable for use on multi-task machines

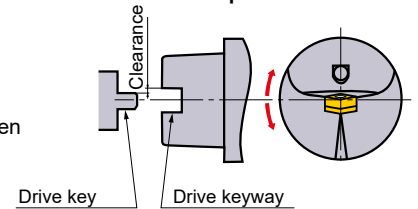
Avoid workpiece interference with improved tool accessibility.

By tilting the machines B spindle (main axis of the tool) at 45 deg, interference between the spindle, holder, workpiece and chuck can be avoided.



Improve centreline height by positioning the cutting edge at the centre of the spindle.

Increased stability and accuracy can be achieved because the cutting edge centreline height is not affected by the gap between the spindle and the key.



## New one-action type double clamp series

The double clamp mechanism offers high rigidity, accuracy and reliability for secure insert clamping. Making it suitable for difficult to machine materials such as stainless and heat resistant alloys.



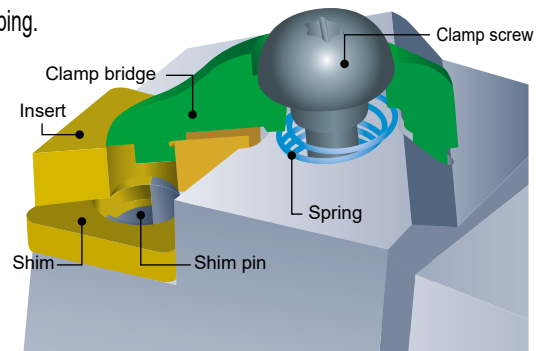
Handed type for turning and facing



Straight type for turning and facing



For turning, facing and boring



## 3 on 1 tool for process and tool consolidation

3 turning inserts of the same geometry can be installed on a single tool.

The same type of inserts can be installed for quick tool changes.

Different types of inserts can be installed for different applications (roughing, semi finishing and finishing)

Different grade inserts can be installed to cover various types of workpieces.



## New HSK-T100 size for large workpieces

Larger tool holder sizes for high efficiency machining.

Square shank holder type



Boring bar / Drill type

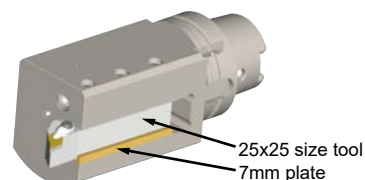


Sleeve




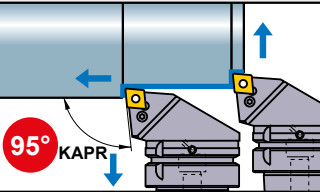

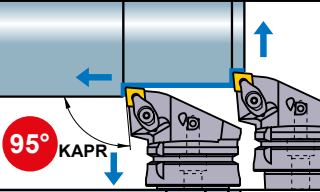

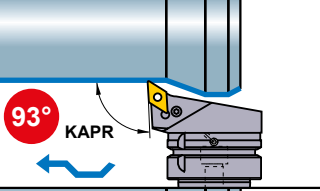

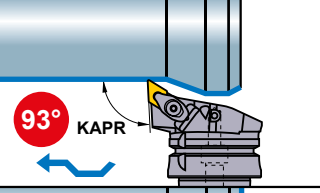

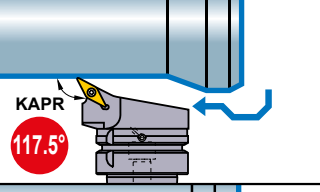

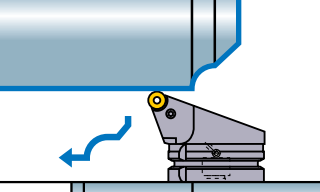

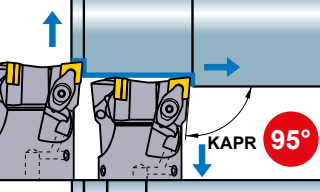

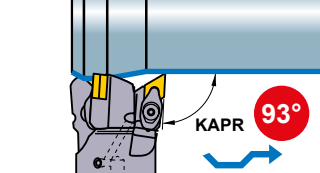
**A single tool can be used with different sized tool holders.**


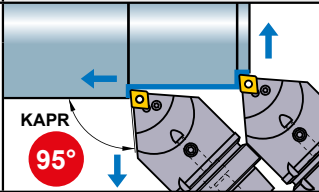

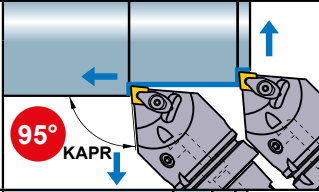

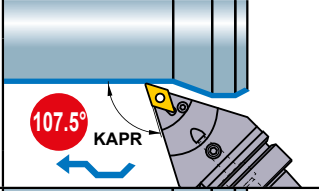

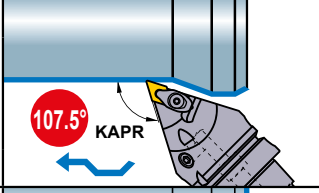

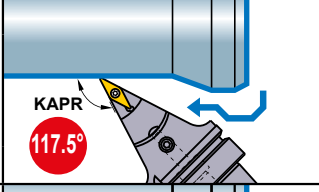

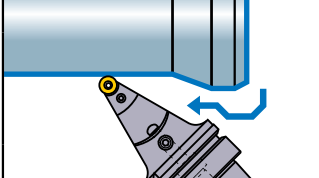
- Available for use with JIS B4126 (ISO 5610) 32 x 32 and 32 x 25 tools.
- Possible to fit a 25 x 25 tool by using a 7mm plate.
- \*Plate not supplied.




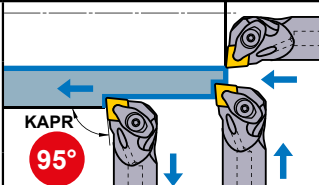
# CLASSIFICATION OF HSK-T TOOLS

## EXTERNAL TURNING • FACING • COPYING

Order Number	Geometry
H63TH-PCLNR/L-DX12  ↻ H006	
H63TH-DCLNR/L-DX12  ↻ H006	
H63TH-PDJNR/L-DX15  ↻ H009	
H63TH-DDJNR/L-DX15  ↻ H009	
H63TH-SVPBR/L-DX16  ↻ H013	
H63TH-PRGCR/L-DX12  ↻ H012	
H63TH-DCLNL-L12-3  ↻ H008	
H63TH-DDJNL-L15-3  ↻ H011	


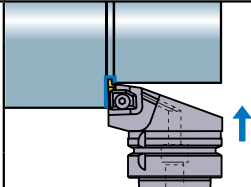

Order Number	Geometry
H63TH-PCMNN-H/L12  ↻ H007	
H63TH-DCMNN-H/L12  ↻ H007	
H63TH-PDNNN-H/L15  ↻ H010	
H63TH-DDNNN-H/L15  ↻ H010	
H63TH-SVVBH-H/L16  ↻ H013	
H63TH-PRDCN-H/L12  ↻ H012	

## EXTERNAL TURNING • FACING • BORING


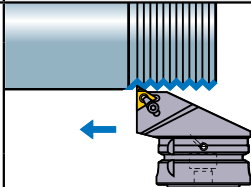


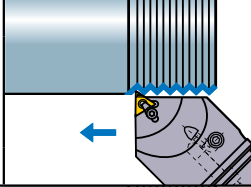


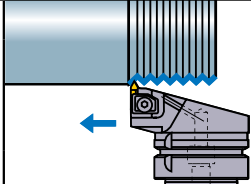

Order Number	Geometry
H63TH-A25KDCLNR/L12 H63TH-A32LDCLNR/L12  ↻ H008	







## GROOVING

Order Number	Geometry
<b>H63TH-MGHR/L-DX43</b>    H014	







## THREADING

Order Number	Geometry
<b>H63TH-MMTER-DX16</b>    H016	
<b>H63TH-MMTENR-H/L16</b>    H016	
<b>H63TH-MTHR/L-DX43</b>    H017	

## EXTERNAL TURNING TOOL HOLDERS

Order Number	Holder
<b>H63TH-EV2525R/L-112</b>   H019	
<b>H100TH-EV3232R/L-180</b>   H019	
<b>H63TH-EN2525R/L-115</b>  *1  H020	
<b>H100TH-EN3232R/L-130</b>  *1  H020	
<b>H63TH-EV2020R/L-105-3</b>   H021	

## BORING BAR HOLDERS

Order Number	Holder
<b>H63TH-B</b>   H021	
<b>H100TH-B</b>   H022	
<b>SL32-90</b> (Sleeve)  *2  H022	

Note 1) The HSK63A shank type has a built-in coolant pipe for installation.

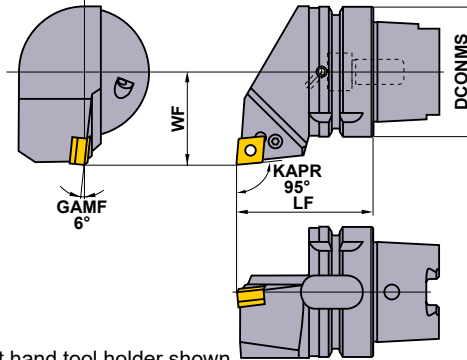
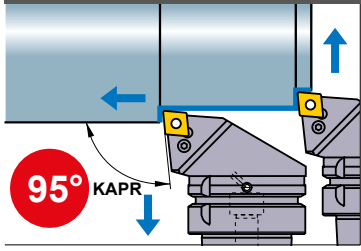
\*1 Mitsubishi Materials is licensed for production and distribution of these tools from MORI SEIKI CO., LTD under Patent No.3720202.

\*2 The SL32-90 sleeve is only for use with H100TH-B32-135.









# HSK-T SYSTEM






## PCLN

External turning • Facing



Right hand tool holder shown.

Finish	Light	Medium
FP  (12)	LP  (12)	MP  (12)
Medium MK  (12)	Medium Standard  (12)	Medium— Rough RP  (12)
Stainless MM  (12)	PCBN  (12)	

Order Number	Stock		Insert Number	Dimensions (mm)			*2 WT (kg)				 *1		
	R	L		DCONMS	LF	WF		Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench	
<b>H63TH-PCLNR/L-DX12</b>	●	●	CN○A CN○G CN○M	1204	63	65	45	1.3	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R

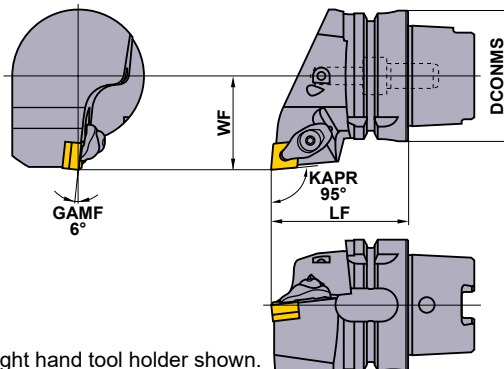
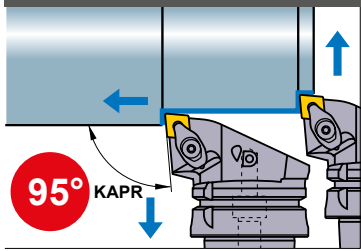
\*1 Clamp Torque (N • m) : LLCS108=3.3

\*2 WT : Tool Weight









Note 1) Dimensions shown for insert corner RE 0.8.







## DCLN

External turning • **DOUBLE CLAMP type**  
Facing



Right hand tool holder shown.

Finish	Light	Medium
FP  (12)	LP  (12)	MP  (12)
Medium MK  (12)	Medium Standard  (12)	Medium— Rough RP  (12)
Stainless MM  (12)	PCBN  (12)	

Order Number	Stock		Insert Number	Dimensions (mm)			*2 WT (kg)					 *1		
	R	L		DCONMS	LF	WF		Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench	
<b>H63TH-DCLNR/L-DX12</b>	●	●	CN○A CN○G CN○M	1204	63	65	45	1.3	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

\*1 Clamp Torque (N • m) : DC0621T=5.0

\*2 WT : Tool Weight









Note 1) Dimensions shown for insert corner RE 0.8.







● : Inventory maintained.

PCLN type inserts	> A098—A104
DCLN type inserts	> A098—A104
PCBN & PCD inserts	> B036—B038, B064
RECOMMENDED CUTTING CONDITIONS	> A074

# PCMN

## External turning • Facing

Finish	Light	Medium
FP  (12)	LP  (12)	MP  (12)
Medium MK  (12)	Medium Standard  (12)	Medium— Rough RP  (12)
Stainless MM  (12)	PCBN  (12)	

Order Number	Stock	Insert Number	Dimensions (mm)		*2 WT (kg)							
			DCONMS	LF		Shim	Shim Pin	Clamp Lever	Clamp Screw	Plug	Wrench	
H63TH-PCMNN-H12	●	CN $\circ$ A CN $\circ$ G CN $\circ$ M	1204 $\circ$	63	100	1.7	LLSCN42	LLP14	LLCL14	LLCS108	HGM-PT1/8	HKY30R
H63TH-PCMNN-L12	●			63	140	2.7	LLSCN42	LLP14	LLCL14	LLCS108	HGM-PT1/8	HKY30R









\*1 Clamp Torque (N • m) : LLCS108=3.3







\*2 WT : Tool Weight

Note 1) Dimensions shown for insert corner RE 0.8.

# DCMNN

## External turning • DOUBLE CLAMP type Facing

Finish	Light	Medium
FP  (12)	LP  (12)	MP  (12)
Medium MK  (12)	Medium Standard  (12)	Medium— Rough RP  (12)
Stainless MM  (12)	PCBN  (12)	

Order Number	Stock	Insert Number	Dimensions (mm)		*2 WT (kg)							
			DCONMS	LF		Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench	
H63TH-DCMNN-H12	●	CN $\circ$ A CN $\circ$ G CN $\circ$ M	1204 $\circ$	63	100	1.7	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
H63TH-DCMNN-L12	●			63	140	2.7	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

\*1 Clamp Torque (N • m) : DC0621T=5.0

\*2 WT : Tool Weight

Note 1) Dimensions shown for insert corner RE 0.8.

H  
HSK-T TOOLS

PCMN type inserts	> A098—A104
DCMNN type inserts	> A098—A104
PCBN & PCD inserts	> B036—B038, B064

RECOMMENDED CUTTING CONDITIONS	> A074
SPARE PARTS	> N001
TECHNICAL DATA	> P001

# HSK-T SYSTEM

**DCLN** External turning • Facing **DOUBLE CLAMP type**

Finish	Light	Medium
FP (12)	LP (12)	MP (12)
Medium MK (12)	Medium Standard (12)	Medium— Rough RP (12)
Stainless MM (12)	PCBN (12)	

Left hand tool holder only.

Order Number	Stock		Insert Number	Dimensions (mm)			*2 WT (kg)	*1						
	L			DCONMS	LF	WF		Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench	
<b>H63TH-DCLNL-L12-3</b>	●		CN $\circ$ A CN $\circ$ G CN $\circ$ M	1204 $\circ$	63	140	30	2.2	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

\*1 Clamp Torque (N • m) : DC0621T=5.0

\*2 WT : Tool Weight

Note 1) Dimensions shown for insert corner RE 0.8.

HSK-T TOOLS

**DCLN** External turning • Facing • Boring **DOUBLE CLAMP type**

Finish	Light	Medium
FP (12)	LP (12)	MP (12)
Medium MK (12)	Medium Standard (12)	Medium— Rough RP (12)
Stainless MM (12)	PCBN (12)	

Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)						*2 WT (kg)	*1						
	R	L		DCONMS	LF	LU	WF	GAMF	DMIN		Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench	
<b>H63TH-A25KDCLNR/L12</b>	●	●	CN $\circ$ A CN $\circ$ G CN $\circ$ M	1204 $\circ$	63	125	82	17	11°	32	1.1	LLSCP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
<b>H63TH-A32LDCLNR/L12</b>	●	●	CN $\circ$ A CN $\circ$ G CN $\circ$ M	1204 $\circ$	63	140	100	22	13°	40	1.4	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

\*1 Clamp Torque (N • m) : DC0621T=5.0

\*2 WT : Tool Weight

Note 1) Dimensions shown for insert corner RE 0.8.

● : Inventory maintained.

DCLN type inserts	> A098—A104
PCBN & PCD inserts	> B036—B038, B064
RECOMMENDED CUTTING CONDITIONS	> A074

# PDJN

## External turning • Copying

Finish	Light	Medium
FP (15)	LP (15)	MP (15)
Medium MK (15)	Medium-Rough RP (15)	Stainless MM (15)
G Class R/L (15)	PCBN (15)	

Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)			*3 WT (kg)	*2					
	R	L		DCONMS	LF	WF		Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench	
<b>H63TH-PDJNR/L-DX15</b>	●	●	DNOA DNOG DNO M DNMX	1504	63	65	45	1.2	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HKY30R

\*1 Clamp Torque (N • m) : LLCS108=3.3

\*2 Please use shim no. LLSDN42 with 6.35mm thick inserts. When using 6.35mm thick inserts, the shim should be ordered separately.

\*3 WT : Tool Weight

Note 1) Dimensions shown for insert corner RE 0.8.

# DDJN

## External turning • Copying

### DOUBLE CLAMP type

Finish	Light	Medium
FP (15)	LP (15)	MP (15)
Medium MK (15)	Medium-Rough RP (15)	Stainless MM (15)
G Class R/L (15)	PCBN (15)	

Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)			*3 WT (kg)	*2						
	R	L		DCONMS	LF	WF		Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench	
<b>H63TH-DDJNR/L-DX15</b>	●	●	DNOA DNOG DNO M DNMX	1504	63	65	45	1.2	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F

\*1 Clamp Torque (N • m) : DC0621T=5.0

\*2 Please use shim no. LLSDN42 with 6.35mm thick inserts. When using 6.35mm thick inserts, the shim should be ordered separately.

\*3 WT : Tool Weight

Note 1) Dimensions shown for insert corner RE 0.8.

H  
HSK-T TOOLS

PDJN type inserts	> A105–A111
DDJN type inserts	> A105–A111
PCBN & PCD inserts	> B039–B042, B064

RECOMMENDED CUTTING CONDITIONS	> A074
SPARE PARTS	> N001
TECHNICAL DATA	> P001

# HSK-T SYSTEM

## PDNN

External turning • Copying

Finish	Light	Medium
FP  (15)	LP  (15)	MP  (15)
Medium MK  (15)	Medium-Rough RP  (15)	Stainless MM  (15)
G Class R/L  (15)	PCBN  (15)	

Order Number	Stock	Insert Number	Dimensions (mm)		*3 WT (kg)	*2					
			DCONMS	LF		Shim	Shim Pin	Clamp Lever	Clamp Screw	Plug	Wrench
H63TH-PDNNN-H15	●	DN $\odot$ A DN $\odot$ G DN $\odot$ M	63	100	1.6	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HGM-PT1/8	HKY30R
H63TH-PDNNN-L15	●	1504 $\odot$	63	140	2.5	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HGM-PT1/8	HKY30R

\*1 Clamp Torque (N • m) : LLCS108=3.3

\*2 Please use shim no. LLSDN42 with 6.35mm thick inserts. When using 6.35mm thick inserts, the shim should be ordered separately.

\*3 WT : Tool Weight

Note 1) Dimensions shown for insert corner RE 0.8.

## DDNN

External turning • Copying **DOUBLE CLAMP type**

Finish	Light	Medium
FP  (15)	LP  (15)	MP  (15)
Medium MK  (15)	Medium-Rough RP  (15)	Stainless MM  (15)
G Class R/L  (15)	PCBN  (15)	

Order Number	Stock	Insert Number	Dimensions (mm)		*3 WT (kg)	*2					
			DCONMS	LF		Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
H63TH-DDNNN-H15	●	DN $\odot$ A DN $\odot$ G DN $\odot$ M	63	100	1.6	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F
H63TH-DDNNN-L15	●	1504 $\odot$	63	140	2.5	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F

\*1 Clamp Torque (N • m) : DC0621T=5.0

\*2 Please use shim no. LLSDN42 with 6.35mm thick inserts. When using 6.35mm thick inserts, the shim should be ordered separately.

\*3 WT : Tool Weight

Note 1) Dimensions shown for insert corner RE 0.8.

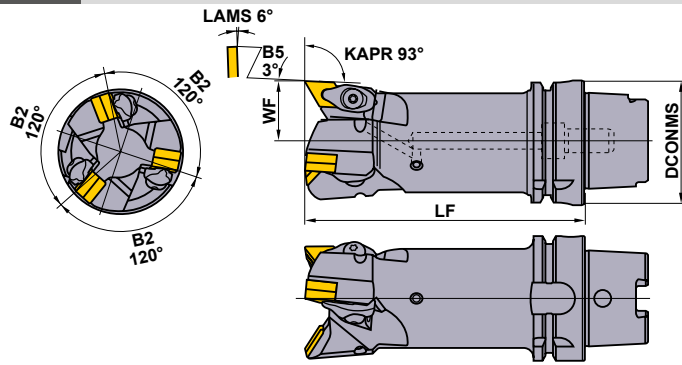
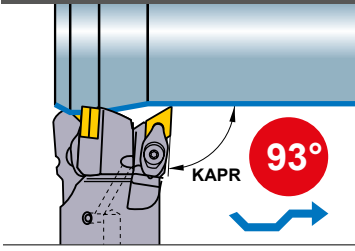
HSK-T TOOLS

● : Inventory maintained.

PDNN type inserts	> A105–A111
DDNN type inserts	> A105–A111
PCBN & PCD inserts	> B039–B042, B064
RECOMMENDED CUTTING CONDITIONS	> A074







# DDJN

## External turning • Facing DOUBLE CLAMP type



Left hand tool holder only.

Finish		Light	
FP	LP		
(15)	(15)		
Medium		Medium	
MP	MK		
(15)	(15)		
Medium—Rough		Stainless	
RP	MM		
(15)	(15)		

Order Number	Stock	Insert Number	Dimensions (mm)			*3 WT (kg)	*2														
			DCONMS	LF	WF																
<b>H63TH-DDJNL-L15-3</b>	●	<table border="1"> <tr> <td>DN</td> <td>A</td> </tr> <tr> <td>DN</td> <td>G</td> </tr> <tr> <td>DN</td> <td>M</td> </tr> <tr> <td>DN</td> <td>MX</td> </tr> </table>	DN	A	DN	G	DN	M	DN	MX	1504	63	140	30	2.2	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F
DN	A																				
DN	G																				
DN	M																				
DN	MX																				

\*1 Clamp Torque (N • m) : DC0621T=5.0

\*2 Please use shim no. LLSDN42 with 6.35mm thick inserts. When using 6.35mm thick inserts, the shim should be ordered separately.

\*3 WT : Tool Weight

Note 1) Dimensions shown for insert corner RE 0.8.

DDJN type inserts	> A105—A111
PCBN & PCD inserts	> B039—B042, B064
RECOMMENDED CUTTING CONDITIONS	> A074

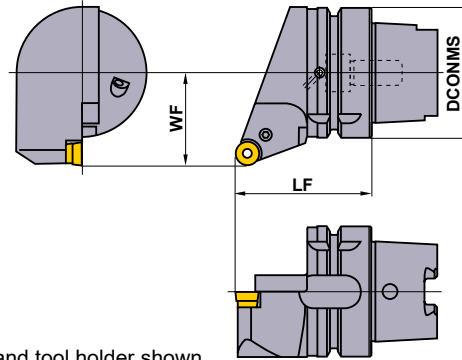
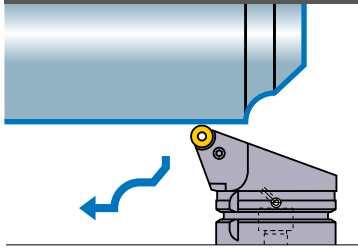
SPARE PARTS	> N001
TECHNICAL DATA	> P001

# HSK-T SYSTEM

## PRGC

External turning • Facing • Copying

Medium



Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)			*2 WT (kg)				*1	
	R	L		DCONMS	LF	WF						
<b>H63TH-PRGCR/L-DX12</b>	●	●	RCMX 1204M0	63	65	45	1.2	LLSRN123	LLP13	LLCL112	LLCS106	HKY25R

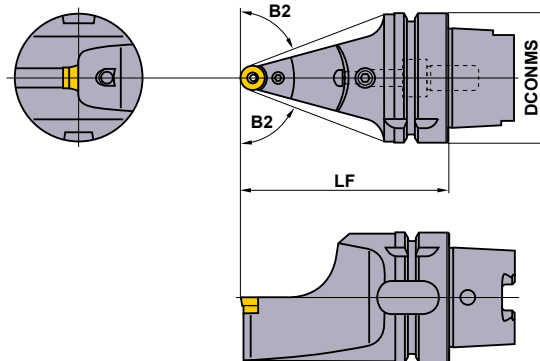
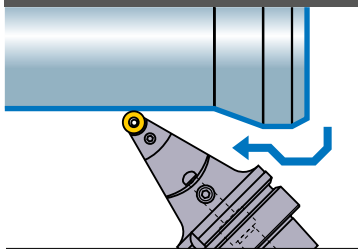
\*1 Clamp Torque (N • m) : LLCS106=2.2

\*2 WT : Tool Weight

## PRDC

External turning • Facing • Copying

Medium



Order Number	Stock		Insert Number	Dimensions (mm)			*2 WT (kg)				*1		
	R	L		DCONMS	LF	B2							
<b>H63TH-PRDCN-H12</b>	●	●	RCMX 1204M0	63	100	69°	1.4	LLSRN123	LLP13	LLCL112	LLCS106	HGM-PT1/8	HKY25R
<b>H63TH-PRDCN-L12</b>	●	●		63	140	75°	2.3	LLSRN123	LLP13	LLCL112	LLCS106	HGM-PT1/8	HKY25R

\*1 Clamp Torque (N • m) : LLCS106=2.2

\*2 WT : Tool Weight

## RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Cutting Mode	Breaker	Grade	Cutting Speed (m/min)
<b>P</b>	Mild Steel	≤180HB	Medium Cutting	<b>Standard</b>	<b>UE6110</b>	205–350
	Carbon Steel Alloy Steel	180HB–350HB	Medium Cutting	<b>Standard</b>	<b>UE6110</b>	150–260
<b>M</b>	Stainless Steel	≤200HB	Medium Cutting	<b>Standard</b>	<b>US735</b>	70–130

● : Inventory maintained.

PRGC type inserts > A154

PRDC type inserts > A154



# SVPB

## Facing • Copying

Finish	Light
R/L-F  (16)	SV  (16)
Medium MV  (16)	Medium MP  (16)
PCBN  (16)	

Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)				*2 WT (kg)					
	R	L		DCONMS	LF	WF	WF2		Shim	Shim Pin	Clamp Screw	Wrench	
<b>H63TH-SVPBR/L-DX16</b>	●	●	VB <sup>○</sup> T VB <sup>○</sup> W	1604	63	65	45	3.8	1.1	SPSVN32	BCP141	TS35D	TKY15F

\*1 Clamp Torque (N • m) : TS35D=3.5

\*2 WT : Tool Weight

Note 1) Dimensions shown for insert corner RE 0.8.

# SVVB

## Facing • Copying

Finish	Light
R/L-F  (16)	SV  (16)
Medium MV  (16)	Medium MP  (16)
PCBN  (16)	

Order Number	Stock		Insert Number	Dimensions (mm)			*2 WT (kg)						
	R	L		DCONMS	LF	B2		Shim	Shim Pin	Clamp Screw	Plug	Wrench	
<b>H63TH-SVVBH-H16</b>	●	●	VB <sup>○</sup> T VB <sup>○</sup> W	1604	63	100	66.5°	1.3	SPSVN32	BCP141	TS35D	HGM-PT1/8	TKY15F
<b>H63TH-SVVBH-L16</b>	●	●	VB <sup>○</sup> T VB <sup>○</sup> W	1604	63	140	72.5°	2.2	SPSVN32	BCP141	TS35D	HGM-PT1/8	TKY15F

\*1 Clamp Torque (N • m) : TS35D=3.5

\*2 WT : Tool Weight

Note 1) Dimensions shown for insert corner RE 0.8.

## RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Cutting Mode	Breaker	Grade	Cutting Speed (m/min)	
<b>P</b>	Mild Steel	≤180HB	Finish Cutting	<b>F</b>	<b>AP25N</b>	250 (150–300)
		Medium Cutting	<b>MP</b>	<b>MC6015</b>	200 (150–250)	
	Carbon Steel Alloy Steel	180HB–350HB	Finish Cutting	<b>F</b>	<b>AP25N</b>	210 (150–260)
			Medium Cutting	<b>MP</b>	<b>MC6025</b>	170 (120–210)
<b>M</b>	Stainless Steel	≤200HB	Medium Cutting	<b>MM</b>	<b>MP7035</b>	100 (70–120)
<b>K</b>	Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	<b>MK</b>	<b>MC5015</b>	170 (140–200)

SVPB type inserts > A164–A166

SVVB type inserts > A164–A166

PCBN inserts > B059

SPARE PARTS > N001

TECHNICAL DATA > P001

H

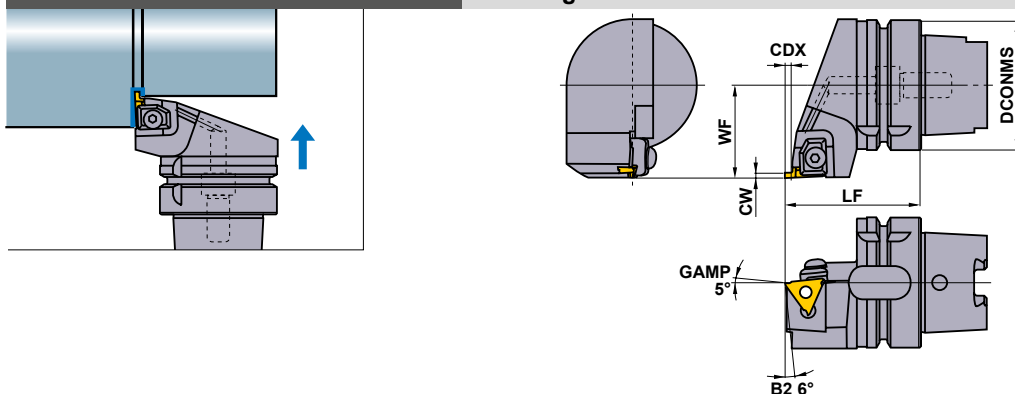
HSK-T TOOLS





H013

# HSK-T SYSTEM

**MG**

Grooving



Order Number	Stock		Insert Number	Dimensions (mm)					*2 WT (kg)	 Clamp Bridge	 Clamp Screw *1	 Spring	 Wrench
	R	L		DCOMMS	CW	CDX	LF	WF					
<b>H63TH-MGHR/L-DX4315</b>	★	★	MGTR/L 43125   43470	63	1.25	1.2	65	45	1.2	MTK1R/L	HBH06020	MES3	HKY40R
				63	1.45	1.5	65	45	1.2				
<b>H63TH-MGHR/L-DX4323</b>	★	★		63	1.5 ≤ CW ≤ 2.3	3	65	45	1.2				
				63	2.3 < CW ≤ 3.3	4.5	65	45	1.2				
<b>H63TH-MGHR/L-DX4333</b>	★	★		63	3.3 < CW ≤ 4.7	4.5	65	45	1.2				

\*1 Clamp Torque (N · m) : HBH06020=7.0

\*2 WT : Tool Weight

H

HSK-T TOOLS

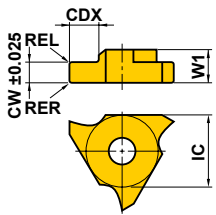
## RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
<b>P</b>	Carbon Steel Alloy Steel	180—350HB	<b>VP20MF</b>	120 (100—140)	0.10 (0.03—0.18)
			<b>NX2525</b>	130 (100—160)	0.12 (0.03—0.2)
<b>M</b>	Stainless Steel	≤200HB	<b>VP20MF</b>	120 (100—140)	0.10 (0.03—0.18)
<b>K</b>	Cast Iron	Tensile Strength ≤350MPa	<b>VP20MF</b>	120 (100—140)	0.10 (0.03—0.18)

● : Inventory maintained. ★ : Inventory maintained in Japan.

(10 inserts in one case) (PCBN inserts are available in 1 piece in one case.)

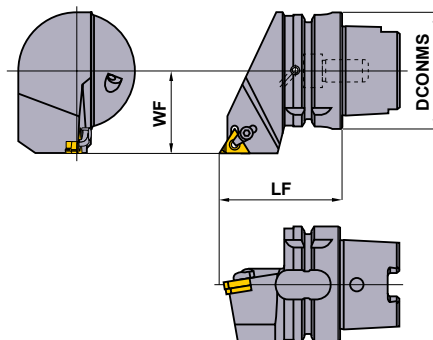
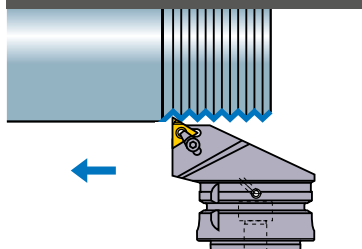
# INSERTS

Order Number	Stock						Dimensions (mm)					Geometry	
	Coated		Cermet		Carbide		CW	CDX	IC	W1	RER/L		LE
	VP20MF		NX2525		UTi20T								
	R	L	R	L	R	L							
MGTR/L43125	★	★	★	★	●	●	1.25	1.2	12.7	4.76	0.2	2.7	<b>MGTR/L...</b> 
MGTR/L43145	★	★		★	●	★	1.45	1.5	12.7	4.76	0.2	—	
MGTR/L43150	★	★	★	●	●	●	1.5	3	12.7	4.76	0.2	2.7	
MGTR/L43175	★	★	★	★	●	●	1.75	3	12.7	4.76	0.2	—	
MGTR/L43200	★	★	★	●	●	●	2	3	12.7	4.76	0.2	2.7	
MGTR/L43230	★	★	●	★	●	●	2.3	3	12.7	4.76	0.2	—	
MGTR/L43250	★	★	★	★	●	●*	2.5	4.5	12.7	4.76	0.3	2.7	
MGTR/L43260	★	★	★		●	●	2.6	4.5	12.7	4.76	0.3	—	
MGTR/L43270	★	★			●	★	2.7	4.5	12.7	4.76	0.3	—	
MGTR/L43280		★		★	●	●	2.8	4.5	12.7	4.76	0.3	—	
MGTR/L43300	★	★	★	★	●	●*	3	4.5	12.7	4.76	0.3	2.7	
MGTR/L43320	★				●	●	3.2	4.5	12.7	4.76	0.3	—	
MGTR/L43330		★		★	●	●	3.3	4.5	12.7	4.76	0.3	—	
MGTR/L43350	★	★	★	★	●	●*	3.5	4.5	12.7	4.76	0.3	2.7	
MGTR/L43400	★	★	★		●	●*	4	4.5	12.7	4.76	0.3	2.7	
MGTR/L43420	★	★	★		●	●	4.2	4.5	12.7	4.76	0.4	—	
MGTR/L43430	★	★	★		●	●	4.3	4.5	12.7	4.76	0.4	—	
MGTR/L43450	★	★	●	★	●	●	4.5	4.5	12.7	4.76	0.4	—	
MGTR/L43470	★	★	★	★	●	★	4.7	4.5	12.7	4.76	0.4	—	

# HSK-T SYSTEM

## MMTE

### Threading



Right hand tool holder only.

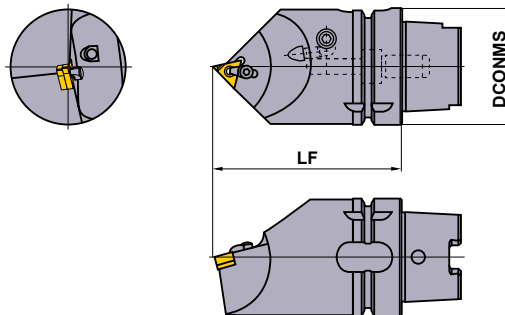
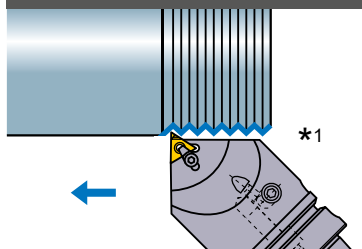
Order Number	Stock R	Insert Number	Dimensions (mm)			*2 WT (kg)		*1			*1	
			DCONMS	LF	WF							
<b>H63TH-MMTER-DX16</b>	★	MMT16ER	63	65	45	1.2	SETK51	SETS51	CR4	CTE32TP15	HFC03008	TKY15F HKY20R

\*1 Clamp Torque (N • m) : SETS51=3.5, HFC03008=1.5

\*2 WT : Tool Weight

## MMTEN

### Threading



Tool holder for right hand insert only.

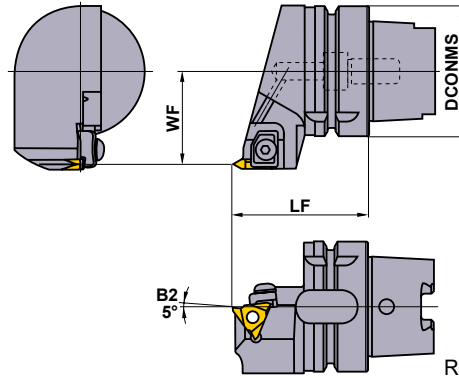
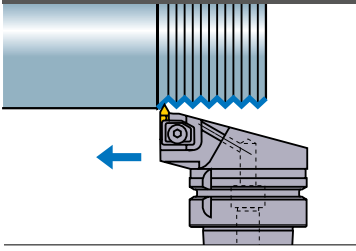
Order Number	Stock	Insert Number	Dimensions (mm)			*3 WT (kg)		*2			*2		
			DCONMS	LF									
<b>H63TH-MMTENR-H16</b>	★	MMT16ER	63	100		1.7	SETK51	SETS51	CR4	CTE32TP15	HFC03008	HGM-PT1/8	TKY15F HKY20R
<b>H63TH-MMTENR-L16</b>	★		63	140		2.7	SETK51	SETS51	CR4	CTE32TP15	HFC03008	HGM-PT1/8	TKY15F HKY20R

\*1 For use with B axis tilted at 45 degrees.





\*2 Clamp Torque (N • m) : SETS51=3.5, HFC03008=1.5

\*3 WT : Tool Weight

★ : Inventory maintained in Japan.

**MT****Threading**

Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (mm)			*2 WT (kg)					
	R	L		DCONMS	LF	WF		Clamp Bridge	Clamp Screw	Spring	Wrench	
<b>H63TH-MTHR/L-DX43</b>	★	★	MTTR/L	43	63	65	45	1.2	MTK1R/L	HBH06020	MES3	HKY40R

\*1 Clamp Torque (N • m) : HBH06020=7.0

\*2 WT : Tool Weight

**H**

HSK-T TOOLS

**RECOMMENDED CUTTING CONDITIONS**

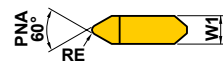



	Work Material	Hardness	Grade	Cutting Speed (m/min)
<b>P</b>	Mild Steel	≤180HB	<b>UP20M</b>	140 (100–180)
			<b>UTi20T</b>	120 (100–150)
	Carbon Steel Alloy Steel	180HB–350HB	<b>UP20M</b>	120 (100–150)
			<b>UTi20T</b>	100 (70–120)
<b>M</b>	Stainless Steel	≤200HB	<b>UP20M</b>	120 (80–150)
			<b>UTi20T</b>	100 (70–130)
<b>K</b>	Cast Iron	Tensile Strength ≤350MPa	<b>UP20M</b>	80 (60–100)
			<b>UTi20T</b>	80 (60–100)
			<b>HTi10</b>	100 (70–130)

APPLICABLE INSERT > H018  
 SPARE PARTS > N001  
 TECHNICAL DATA > P001

**H017**

# HSK-T SYSTEM

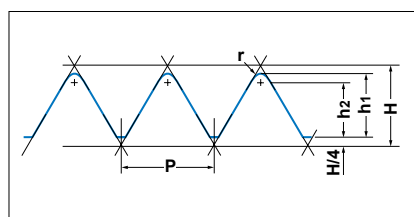
## INSERTS

Type	Order Number	Class	Coated				ISO Pitch mm (thread/inch)	Dimensions (mm)			Geometry
			UP20M	Cermet	Carbide			IC	W1	RE	
General 60°	MTTR436000	G		●	●		-0.8	12.7	4.76	0	MTTR/L(60°) (G Class)   Right hand insert shown.
	MTTR436001	G	★	●	●	★	1.0-1.75	12.7	4.76	0.1	
	MTTL436001	G	★		●	★	1.0-1.75	12.7	4.76	0.1	
	MTTR436002	G	★	●	●	★	2.0-2.5	12.7	4.76	0.2	
	MTTL436002	G		●	●		2.0-2.5	12.7	4.76	0.2	
	MTTR436003	G	★	●	●	★	3.0-3.5	12.7	4.76	0.3	
	MTTL436003	G		●	●		3.0-3.5	12.7	4.76	0.3	
	MTTR436004	G		●	●		4.0-4.5	12.7	4.76	0.4	
General 55°	MTTR435501	G		●	★		(28-10)	12.7	4.76	0.1	MTTR(55°) (G Class)   Right hand insert shown.
	MTTR435502	G		●	●		(16-8)	12.7	4.76	0.2	
	MTTR435503	G		●	●		(11-8)	12.7	4.76	0.3	

### STANDARD OF DEPTH OF CUT ● METRIC SCREW THREAD

Unit : mm

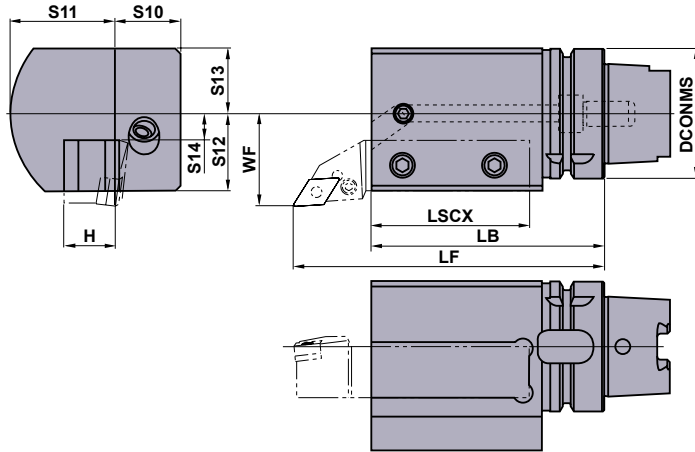
- The chart on the right shows the cutting depths when machining external ISO metric screw threads.
- When using cermet grades or cutting stainless steel, please increase the number of passes by 2-3 times.



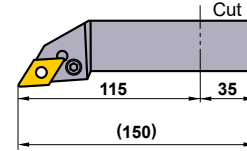
P (Pitch)	0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50	
h1	0.46	0.61	0.77	0.92	1.07	1.23	1.53	1.84	2.15	2.45	2.76	
h2	0.35	0.47	0.59	0.70	0.82	0.94	1.17	1.41	1.65	1.87	2.11	
r (Nose Radius)	0.11	0.14	0.18	0.22	0.25	0.29	0.36	0.43	0.50	0.58	0.65	
Number of Passes	1	0.18	0.20	0.20	0.25	0.25	0.25	0.30	0.30	0.35	0.35	0.40
	2	0.13	0.15	0.18	0.20	0.20	0.25	0.25	0.25	0.30	0.30	0.35
	3	0.10	0.10	0.12	0.15	0.20	0.20	0.20	0.25	0.25	0.25	0.30
	4	0.05	0.10	0.12	0.15	0.15	0.15	0.20	0.20	0.20	0.25	0.25
	5		0.06	0.10	0.10	0.12	0.15	0.15	0.20	0.20	0.25	0.25
	6			0.05	0.07	0.10	0.10	0.10	0.15	0.20	0.20	0.20
	7					0.05	0.08	0.10	0.15	0.15	0.20	0.20
	8						0.05	0.10	0.10	0.15	0.15	0.15
	9							0.08	0.10	0.10	0.15	0.15
	10							0.05	0.09	0.10	0.10	0.15
	11								0.05	0.10	0.10	0.10
	12									0.05	0.10	0.10
	13										0.05	0.10
	14											0.06

Note 1) The first pass causes a high load on the cutting edge.  
 In order to avoid damage, restrict the depth of cut to a maximum of 0.4-0.5mm.

# EXTERNAL TURNING TOOL HOLDERS External turning • Facing



■ This holder is for 25×25 size tools.  
Please shorten the tool as shown below before use.

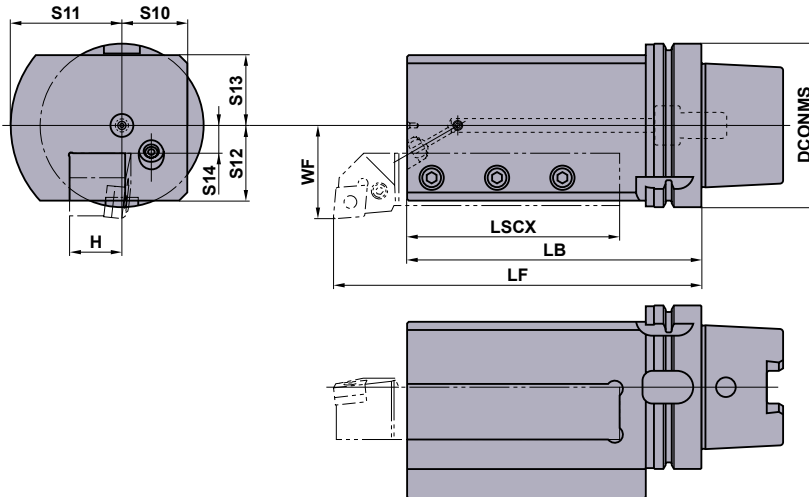


Right hand tool holder shown.

Order Number	Stock		Dimensions (mm)										* WT (kg)			
	R	L	DCONMS	LF	LB	LSCX	H	S10	S11	WF	S14	S12				S13
<b>H63TH-EV2525R/L-112</b>	★	★	63	150	112	77	25	32	53	45	13	38	32	3.9	HSS12025	HGM-PT1/8

\* WT : Tool Weight

# EXTERNAL TURNING TOOL HOLDERS External turning • Facing



■ This holder is for 32×32 and 32×25 size tools.

Right hand tool holder shown.

Order Number	Stock		Dimensions (mm)										* WT (kg)			
	R	L	DCONMS	LF	LB	LSCX	H	S10	S11	WF	S14	S12				S13
<b>H100TH-EV3232R/L-180</b>	★	★	100	220	180	130	32	40	68	57	17	46	43	11.7	HSS14035	HSS06006

Note 1) Can be used with 32 x 32 and 32 x 25 tool holders. Possible to fit a 25 x 25 tool by using a 7mm plate.

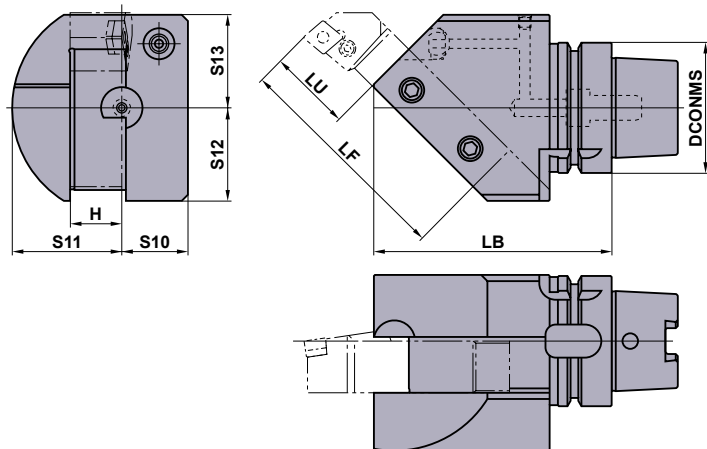
\* WT : Tool Weight

H

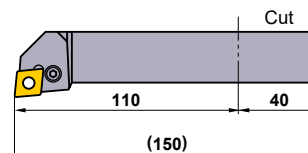
HSK-T TOOLS

# HSK-T SYSTEM

## EXTERNAL TURNING TOOL HOLDERS External turning • Facing





■ This holder is for 25×25 size tools.  
Please shorten the tool as shown below before use.



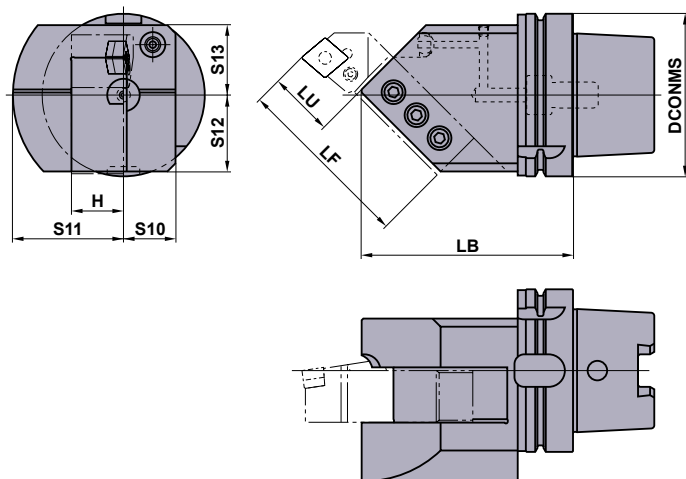
Mitsubishi Materials is licensed to produce and distribute these tools by MORI SEIKI CO., LTD under Patent No.3720202.

Right hand tool holder shown.

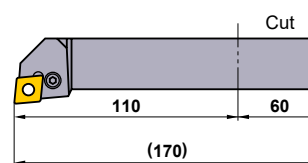
Order Number	Stock		Dimensions (mm)									* WT (kg)	 Clamp Screw	 Plug
	R	L	DCONMS	LB	LU	LF	H	S10	S11	S12	S13			
H63TH-EN2525R/L-115	★	★	63	115	40	110	25	32	53	45	45	3.7	HSS12030	HSS06006

\* WT : Tool Weight

## EXTERNAL TURNING TOOL HOLDERS External turning • Facing





■ This holder is for 32×32 and 32×25 size tools.  
Please shorten the tool as shown below before use.



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Right hand tool holder shown.

Order Number	Stock		Dimensions (mm)									* WT (kg)	 Clamp Screw	 Plug
	R	L	DCONMS	LB	LU	LF	H	S10	S11	S12	S13			
H100TH-EN3232R/L-130	★	★	100	130	40	110	32	32	68	47	43	6.6	HSS14030	HSS06006

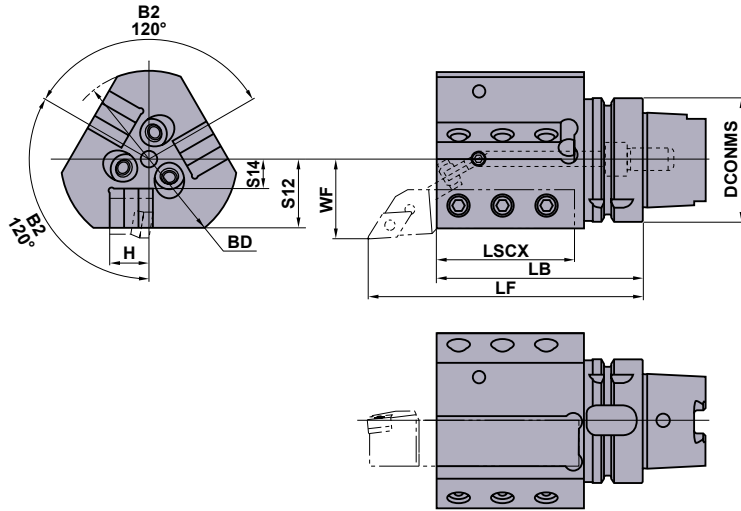
Note 1) Can be used with 32 x 32 and 32 x 25 tool holders. Possible to fit a 25 x 25 tool by using a 7mm plate.

\* WT : Tool Weight

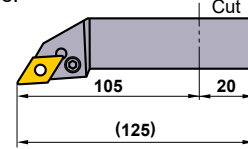
★ : Inventory maintained in Japan.






# EXTERNAL TURNING TOOL HOLDERS External turning • Facing



■ This holder is for 20×20 size tools.  
Please shorten the tool as shown below before use.

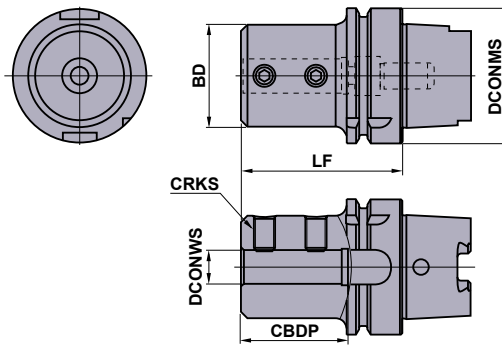



Right hand tool holder shown.

Order Number	Stock		Dimensions (mm)									* WT (kg)	  		
	R	L	DCONMS	LF	LB	LSCX	H	BD	WF	S14	S12		Clamp Screw	Nozzle Plug	Plug
H63TH-EV2020R/L-105-3	★	★	63	140	105	70	20	90	40	15	35	2.9	HSS12030	HSS05012	HSS06006

\* WT : Tool Weight

# BORING BAR HOLDERS Boring



Order Number	Stock	Dimensions (mm)						* WT (kg)	
		DCONMS	BD	DCONWS	LF	CBDP	CRKS		Clamp Screw
H63TH-B08-65	★	63	28	8	65	40	M8	0.9	HSS08010
H63TH-B10-70	★	63	35	10	70	45	M8	1.0	HSS08012
H63TH-B12-70	★	63	42	12	70	45	M8	1.1	HSS08012
H63TH-B16-75	★	63	48	16	75	50	M10	1.3	HSS10016
H63TH-B20-75	★	63	52	20	75	50	M10	1.4	HSS10016
H63TH-B25-83	★	63	62	25	83	58	M12	1.7	HSS12016
H63TH-B32-87	★	63	62	32	87	62	M12	1.7	HSS12016
H63TH-B40-97	★	63	65	40	97	72	M16	1.8	HSS16012

Note 1) Please cut the boring bar to adjust the shank length. This also applies to indexable type drills.

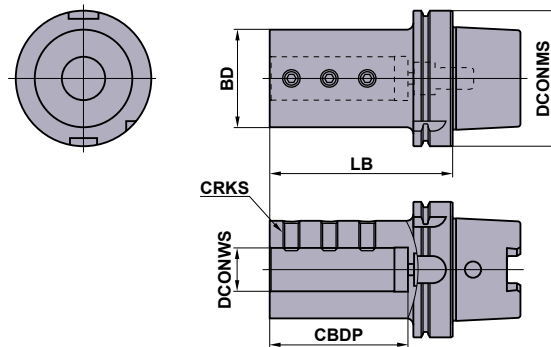
\* WT : Tool Weight


H

HSK-T TOOLS

# HSK-T SYSTEM

## BORING BAR HOLDERS Boring

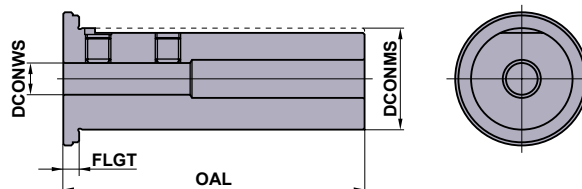



Order Number	Stock	Dimensions (mm)						* WT (kg)	 Clamp Screw
		DCONMS	BD	DCONWS	LB	CBDP	CRKS		
H100TH-B25-120	★	100	62	25	120	88	M12	3.9	HSS12016
H100TH-B32-135	★	100	72	32	135	102	M12	4.8	HSS12018
H100TH-B40-150	★	100	82	40	150	117	M16	5.9	HSS16020
H100TH-B50-180	★	100	92	50	180	147	M16	7.7	HSS16020

Note 1) Available for use with a sleeve for small round-shank tool installation.

\* WT : Tool Weight

## BORING BAR SLEEVES FOR H100TH-B32-135



Order Number	Stock	Dimensions (mm)				* WT (kg)	 Clamp Screw
		DCONWS	DCONMS	OAL	FLGT		
SL3208-90	★	8	32	95	5	0.6	HSS06008
SL3210-90	★	10	32	95	5	0.5	HSS08008
SL3212-90	★	12	32	95	5	0.5	HSS08008
SL3216-90	★	16	32	95	5	0.5	HSS08006
SL3220-90	★	20	32	95	5	0.4	HSS08005

Note 1) These sleeves are only compatible with H100TH-B32-135 holder.

\* WT : Tool Weight

# Memo

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# Memo

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A series of horizontal dashed lines for writing, spanning the width of the page.

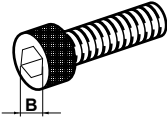
# SPARE PARTS

IDENTIFICATION .....	N002
SPARE PARTS	
CLAMP SCREW .....	N003
SET BOLT .....	N009
ADJUSTMENT SCREW / NUT .....	N010
SHIM .....	N011
SHIM PIN AND CLAMP LEVER .....	N014
LOCK PIN .....	N015
CLAMP BRIDGE .....	N015
BREAKER PIECE .....	N017
ANTI SEIZE LUBRICANT .....	N018



# IDENTIFICATION

## IDENTIFICATION OF CLAMP SCREW (Metric coarse right hand screw thread)



**H SC 060 05**

Length

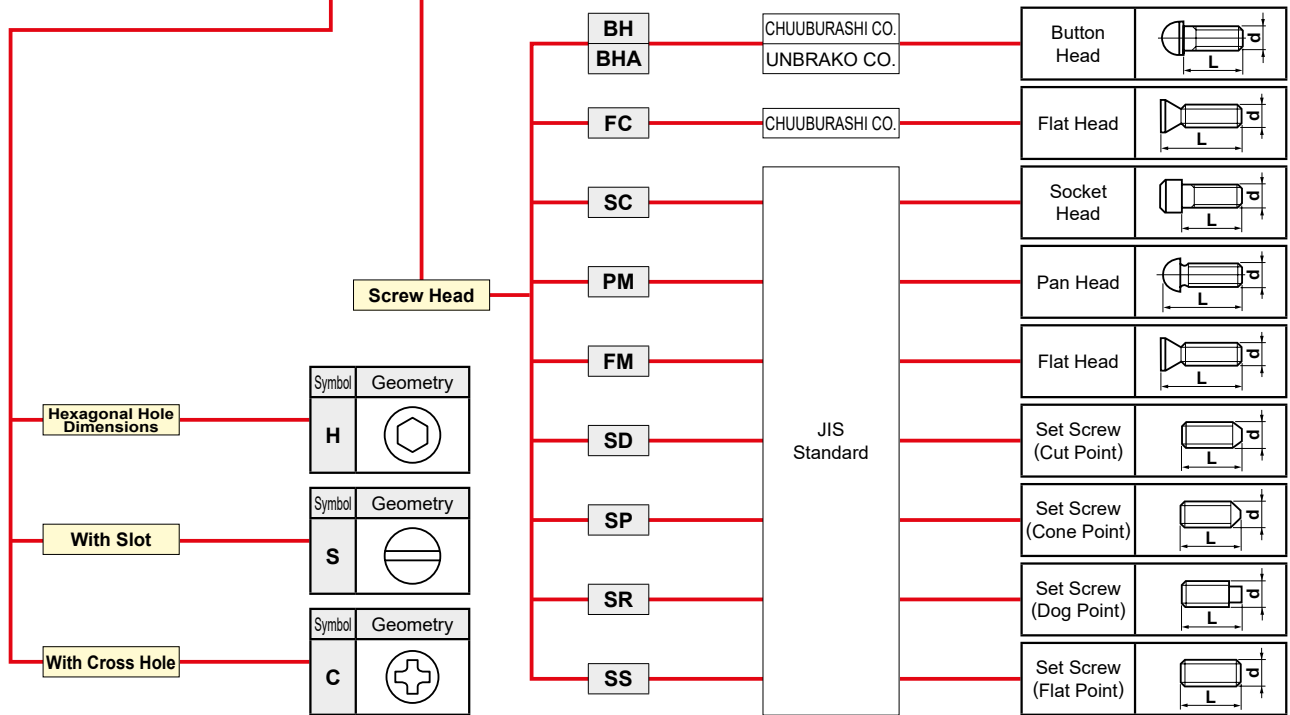
Example	
Symbol	L
05	5
10	10
20	20
30	30

Screw Diameter

Example	
Symbol	d
050	M5
060	M6

### Hexagonal Hole Dimensions

Diameter	Pitch	B Dimensions			
		HBH	HFC	HSC	HS $\odot$
M2	0.4	—	—	1.5	0.9
M2.5	0.45	—	—	2	1.3
M3	0.5	2	2	2.5	1.5
M4	0.7	2.5	2.5	3	2
M5	0.8	3	3	4	2.5
M6	1	4	4	5	3
M8	1.25	5	5	6	4
M10	1.5	6	6	8	5



Hexagonal Hole Dimensions

Symbol	Geometry
H	

With Slot

Symbol	Geometry
S	

With Cross Hole

Symbol	Geometry
C	

SPARE PARTS Z

## IDENTIFICATION OF WRENCH

**HKY 15 R**

Symbol	Wrench
HKY	Hexagonal Wrench
TKY	Torx Wrench
RKY	R Wrench
TIP	Torx plus Wrench

Hexagonal Wrench	
Symbol	B
15	1.5
20	2
25	2.5
30	3
35	3.5
40	4
50	5
60	6

Torx Wrench		
Symbol	B	Size
06	1.7	T6
08	2.3	T8
10	2.7	T10
15	3.3	T15
20	3.8	T20
25	4.4	T25
27	5.0	T27
30	5.5	T30

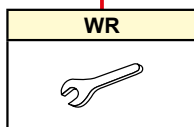
Torx plus Wrench		
Symbol	B	Size
06	1.8	6IP
07	2.1	7IP
08	2.4	8IP
10	2.8	10IP
15	3.4	15IP

R	Standard L Wrench	
L	Long L Wrench	
T	T Wrench	
F	Flag Wrench	
FS	Flag Wrench	
W	Flag Wrench	
D	Driver	
DS	Driver	
S	Wrench	

**IMX 10 - WR**

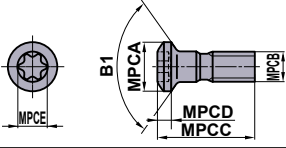
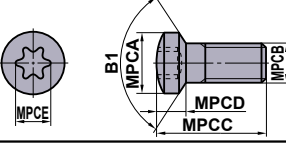
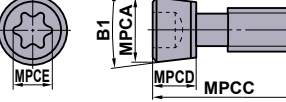
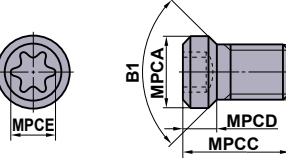
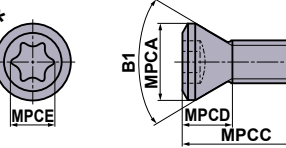
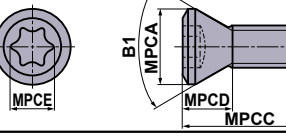
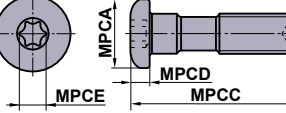
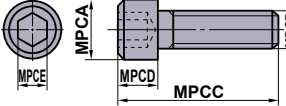
Symbol	Wrench
IMX	Wrench for iMX Series

Hexagonal Wrench	
Symbol	B
10	8
12	10
16	13
20	16
25	20



# SPARE PARTS

## CLAMP SCREW

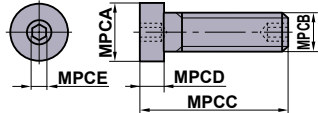
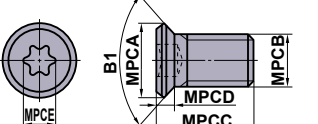
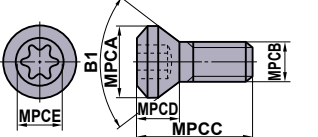
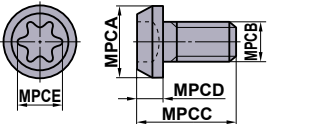
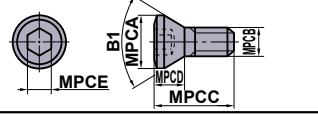
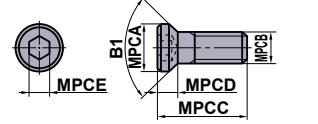
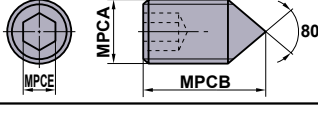
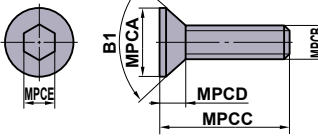
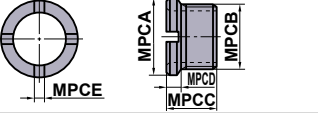
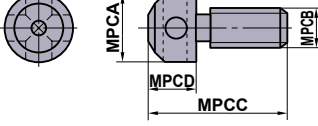
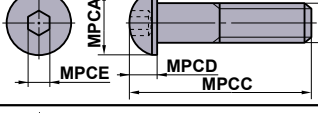
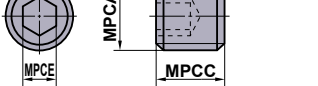
Geometry	Order Number	Dimensions (mm)					Angle	MPCCS	TQ (N·m)	Tool Holder
		MPCA	MPCB	MPCC	MPCD	MPCE				
	AJS3010T10	5	M3×0.5	10	1.5	2.8	120°	T10	2.5	Profile Holder (☉C032) AJX (☉K180) AJX (☉K180)
	AJS4012T15	7	M4×0.7	12	2.2	3.4	120°	T15	3.5	
	AJS5014T25	8	M5×0.8	14	2.7	4.5	120°	T25	7.5	
	BRS103	5	M3×0.5	9.9	2.9	3.4	120°	T15	3.5	
	BRS105	8	M5×0.8	13.8	3.8	4.5	120°	T25	7.5	
	CAS51T	7.9	M5×0.8	19	5	4.5	10°	T25	8.5	
 	CS200T	3.2	M2×0.4	5	1.6	1.8	90°	T6	0.6	F Type Boring Bar (☉E027)
	CS250T	3.7	M2.5×0.45	6	1.8	2.4	90°	T8	1.0	Milling Tools Series (☉K001)
	* CS250560T	3.9	M2.5×0.45	5.2	2.5	2.4	60°	T8	1.0	BRP (☉K190)
	CS300590T	4.1	M3×0.5	5.5	2.1	2.4	90°	T8	1.0	DCCC (☉K200)
	CS300790TS	4.7	M3×0.5	7	2.3	2.8	90°	T10	2.0	
	CS300890T	4.1	M3×0.5	8	2.1	2.4	90°	T8	1.0	
	CS350690T	4.8	M3.5×0.6	6.5	2.4	2.8	90°	T10	2.5	MMTI Type Boring Bar (☉G026) BRP (☉K190) DCCC (☉K200)
	* CS350760T	5.5	M3.5×0.6	7	4.0	3.4	60°	T15	3.5	
	CS350790T	4.8	M3.5×0.6	7	2.4	2.8	90°	T10	3.5	
	* CS350860T	5.5	M3.5×0.6	8.4	4.0	3.4	60°	T15	3.5	AL Type Holder (☉C034)
	CS350990T	4.8	M3.5×0.6	9	2.4	2.8	90°	T10	2.5	
	CS400990T	6.0	M4×0.7	9	2.8	3.4	90°	T15	3.5	
	CS401160T	5.7	M4×0.7	11	4.5	3.4	60°	T15	3.5	AHX640S (☉K041)
	CS401990T	6.0	M4×0.7	19	3.0	3.9	90°	T20	3.5	
	CS451190T	6.3	M4.5×0.75	11	2.9	3.9	90°	T20	5.0	
* CS501160T	7.0	M5×0.8	11	3.6	3.9	60°	T20	5.0	PMR (☉K236)	
CS501290T	7.0	M5×0.8	11	3.5	4.5	90°	T25	7.5		
* CS5015060T	7.2	M5×0.8	15	2.4	3.9	60°	T20	5.0		
CS502190T	8.5	M5×0.8	21	4.0	5.1	90°	T27	7.5	DOUBLE CLAMP Holder (☉C008) DOUBLE CLAMP DIMPLE BAR (☉E015) HSK Tool Holder (☉H001)	
CS6016060T	8.5	M6×1.0	16	4.5	4.5	60°	T25	7.5		
	CSF401260T	7.2	M4×0.5	12	5.2	3.9	60°	T20	5.0	
	DC0520T	8.5	M5×0.8	22.5	2.5	3.4	—	T15	3.5	DOUBLE CLAMP DIMPLE BAR (☉E015) HSK Tool Holder (☉H001)
	DC0621T	10.5	M6×1.0	25	4	3.9	—	T20	5.0	
	DKS4	5.6	M4×0.7	18	3.5	3	—	—	3.3	
	DKS5	7.6	M5×0.8	19	4.5	4	—	—	7.0	

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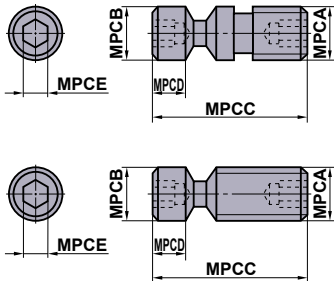
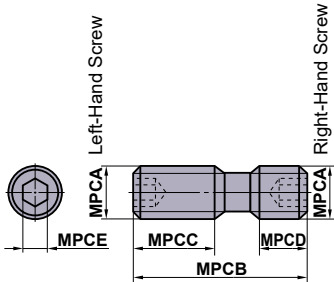
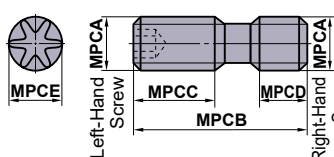
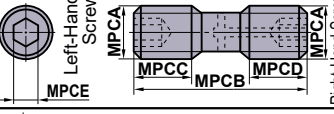
SPARE PARTS

# SPARE PARTS

## CLAMP SCREW

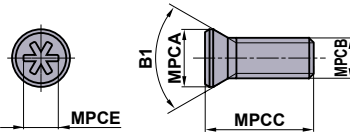
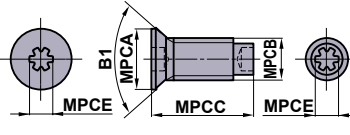
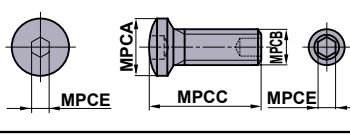
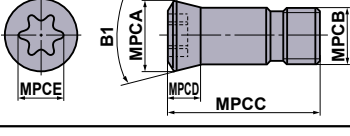
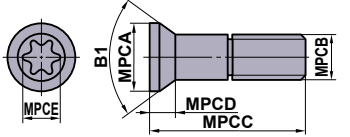
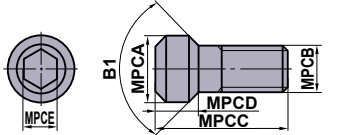
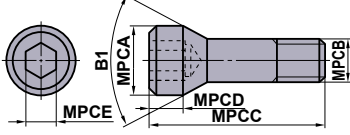
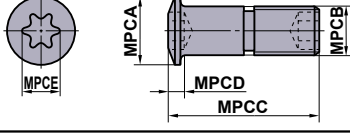
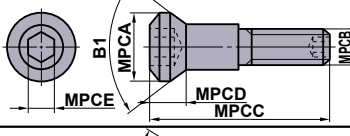
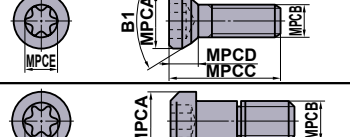
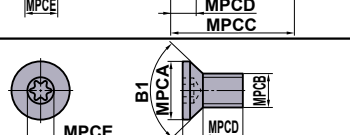

Geometry	Order Number	Dimensions (mm)					Angle		TQ (N·m)	Tool Holder
		MPCA	MPCB	MPCD	MPCCE	MPCB	B1	MPCOS		
	<b>EGS06019</b>	9	M6×1	22.5	3.5	3	—	—	3.3	
	<b>EGS08024</b>	11	M8×1.25	28.5	4.5	4	—	—	7.0	
	<b>FC400890T</b>	5.6	M4×0.7	7.5	1.3	2.8	90°	T10	2.5	AL Type Holder (☉C035) AL Type Boring Bar (☉E041)
	<b>GY05016S</b>	8.7	M5×0.8	16	3.5	3.9	90°	T20	5.0	GY Series (☉F004)
	<b>GY06013M</b>	12	M6×1	18	5	5.6	—	T30	6.0	GY Series (☉F004)
	<b>HFF06015</b>	10	M6×1	15	6	5	80°	—	8.2	
	<b>HS4L</b>	5.4	M4×0.7	14	2.3	2.5	80°	—	3.8	
	<b>HS5S</b>	6.8	M5×0.8	9	2.8	3	80°	—	3.3	
	<b>HS5L</b>	6.8	M5×0.8	15	2.8	3	80°	—	6.6	
	<b>HSP05008C</b>	M5×0.8	8	—	—	2.5	—	—	2.5	MP Type Holder (☉C019)
	<b>HY-A1</b>	4.4	M3×0.5	7	2.1	2	82°	—	1.5	
	<b>HY-V1</b>	5.5	M3×0.5	7	2.5	2	82°	—	1.5	
	<b>HY2</b>	5.5	M3×0.5	10	2.5	2	82°	—	1.5	
	<b>HY3</b>	7	M3.5×0.6	12	2.9	2	82°	—	1.5	
	<b>HY4</b>	9.3	M5×0.8	16	3.6	3	82°	—	3.3	
	<b>JSS6</b>	6.9	M6×0.75	4.5	1.5	0.8	—	—	—	
	<b>JSS7</b>	8	M7×0.75	4.4	1.5	1	—	—	—	
	<b>KS1</b>	7	M4×0.7	14	5	—	—	—	—	
	<b>KS2</b>	10	M6×1	18	7	—	—	—	—	
	<b>KS2S</b>	10	M6×1	18	7	—	—	—	—	
	<b>KS12</b>	10	M6×1	26	4	4	—	—	7.0	
	<b>LLR1</b>	M5×0.8	—	3.5	—	2.5	—	—	—	
	<b>LLR2</b>	M6×1	—	5	—	3	—	—	—	



Geometry	Order Number	Dimensions (mm)					Angle B1	MPCOS	TQ (N·m)	Tool Holder		
		MPCA	MPCB	MPCC	MPCD	MPCE						
 <p>LLCS103, LLCS105 LLCS112, LLCS125 LLCS205</p> <p>The products with "*" do not have a hexagonal hole at the end marked MPCB.</p> <p>The products with "☆" do not have a hexagonal hole at the end marked MPCA.</p>	☆ LLCS103	M3×0.5	4	11	4.6	2	—	—	1.5	P Type Boring Bar (E037) HSK Tool Holder (H001)		
	* LLCS105	M5×0.8	M5×0.8	10	1.5	2	—	—	1.5			
	LLCS106	M6×1	6	16.5	3.5	2.5	—	—	2.2			
	* LLCS106S	M6×1	6	13.4	0.7	2.5	—	—	2.2			
	LLCS108	M8×1.25	8	21	6.5	3	—	—	3.3			
	* LLCS108S	M8×1.25	8	16.5	2	3	—	—	3.3			
	LLCS110	M10×1.5	10	29	8	4	—	—	7.0			
	LLCS112	M12×1	11.9	36.2	9	5	—	—	8.0			
	LLCS125	M5×0.8	M5×0.8	12	2	2	—	—	1.5			
	LLCS205	M5×0.8	M5×0.8	16	4	2	—	—	1.5			
	LLCS206	M6×1	6	26	13	2.5	—	—	2.2			
	LLCS208	M8×1.25	8	24	6.5	3	—	—	3.3			
	LLCS306	M6×1	6	21	4	2.5	—	—	2.2			
	LLCS308	M8×1.25	8	42	27.5	3	—	—	3.3			
	LLCS310	M10×1	10	29	8	4	—	—	7.0			
	LLCS410	M10×1	10	30	6.6	4	—	—	7.0			
	LLCS508	M8×1	8	24	6.5	3	—	—	3.3			
	* LLCS508S	M8×1	8	20.5	3	3	—	—	3.3			
	 <p>Left-Hand Screw Right-Hand Screw</p> <p>*Without Hexagonal Hole on Right-Hand Screw</p>	LS1	M6×1	22	8	8	3	—	—		5.0	Milling Tools Series (K001)
		LS2	M8×1	29	13	10	4	—	—		8.2	
LS3		M8×1	32	13	13	4	—	—	8.2			
* LS4		M6×1	15	8	4	3	—	—	5.0			
* LS5		M6×1	18	8	5	3	—	—	5.0			
* LS6		M8×1	24	13	5	4	—	—	8.2			
* LS7		M8×1	27	13	8	4	—	—	8.2			
* LS8		M6×0.75	18	7	7	3	—	—	5.0			
* LS9		M6×0.75	22	8	8	3	—	—	5.0			
* LS10		M7×0.75	16	6	6	4	—	—	8.2			
* LS11		M8×1	16	6	6	4	—	—	7.8			
* LS12		M8×1	24	7	7	4	—	—	7.8			
* LS13		M8×1	34	12	12	4	—	—	7.8			
* LS14		M7×0.75	24	10	10	4	—	—	7.8			
* LS16		M7×0.75	23	11	8	4	—	—	7.8			
* LS18		M7×0.75	14	6	4	4	—	—	7.8			
* LS20		M10×1.5	26	9	9	5	—	—	9.0			
* LS21		M10×1.5	32	12	12	5	—	—	9.0			
LS24		M8×1.25	24	8.5	8.5	4	—	—	7.8			
LS25		M8×1	28.5	12.0	10.5	4	—	—	8.2			
 <p>Left-Hand Screw Right-Hand Screw</p>		LS10T	M7×0.75	14	6	5	4.5	—	T25	8.0	DOUBLE CLAMP Holder (C009) AHX640W (K048)	
		LS14T	M7×0.75	24	10	10	4.5	—	T25	8.0		
		LS15T	M7×0.75	18	7	7	4.5	—	T25	8.0		
		LS19T	M6×0.75	11	4	4	3.4	—	T15	5.0		
		LS10TS	M7×0.75	13	6	4	4.5	—	T25	8.5		
	LS0622T	M6×0.75	22	8	8	3.4	—	T15	6.0			
	LS24H	M8×1.25	24	8.5	8.5	4	—	—	8.2			
 <p>Left-Hand Screw Right-Hand Screw</p>	MGS6	10	M6×1	26	4	5	—	—	9.0	APX3000 (K133)		
	MHT1	11	M8×1	18.5	3.5	4	—	—	8.7			

# SPARE PARTS

## CLAMP SCREW

Geometry	Order Number	Dimensions (mm)					Angle	MPCDS	TQ (N·m)	Tool Holder
		MPCA	MPCB	MPC	MPCD	MPCCE				
	<b>NS251</b>	3.6	M2.5×0.45	7	—	2.2	60°	—	0.7	<b>BTVH</b> (⊕D016) <b>CSVH</b> (⊕D027) <b>CTAH-S</b> (⊕D020)
	<b>NS401</b>	5.8	M4×0.7	6	—	3.6	60°	—	3.5	
	<b>NS402W</b>	5.85	M4×0.7	10	—	2.2	60°	—	0.7	<b>CTAH</b> (⊕D020) <b>CTBH</b> (⊕D022)
	<b>NS403W</b>	5.85	M4×0.7	12	—	2.2	60°	—	0.7	
	<b>NS404W</b>	5.8	M4×0.7	10	—	2.2	90°	—	0.7	
	<b>NS501W</b>	8	M5×0.8	16	—	2.5	120°	—	2.2	<b>SMALL TOOLS</b> (⊕D001)
	<b>NS502W</b>	8	M5×0.8	20	—	2.5	120°	—	2.2	
	<b>RN-S6</b>	9.5	M6×0.75	20.3	4.6	3.9	61°	T20	5.0	
	<b>RN-S7</b>	11	M7×0.75	24.7	5.2	4.5	61°	T25	7.5	
	<b>RS3008T</b>	4.3	M3×0.35	8.6	2	2.4	61°	T8	1.5	<b>SRF</b> (⊕K212) <b>SUF</b> (⊕K216)
	<b>RS3510T</b>	5	M3.5×0.35	10	2.3	2.8	61°	T10	2.5	
	<b>RS4015T</b>	6	M4×0.5	14	2.7	3.4	61°	T15	3.3	
	<b>RS5020T</b>	8.1	M5×0.5	16.4	3.6	3.9	61°	T20	5.0	
	<b>RS6025T</b>	9.5	M6×0.75	21.5	4.2	4.5	61°	T25	7.5	
	<b>RS8030T</b>	12	M8×0.75	25	5	5.6	61°	T30	10.0	
	<b>S1</b>	3.5	M2×0.4	5.5	2.2	1.5	92°	—	0.6	
	<b>S3</b>	4.5	M3×0.5	7.7	2.4	2	92°	—	1.5	
	<b>S4</b>	5.3	M4×0.7	8	1.8	2.5	62°	—	2.2	
	<b>S5</b>	6.8	M5×0.8	9	2.4	3	62°	—	3.3	
	<b>SD32</b>	12	M8×1.25	28	7.2	6	50°	—	9.5	
	<b>SD40</b>	12	M8×1.25	36	7.2	6	50°	—	9.5	
	<b>SD50</b>	16	M10×1.5	46	8.2	8	50°	—	1.0	
	<b>SD63</b>	16	M10×1.5	61	8.2	8	50°	—	1.0	
	<b>SETS51</b>	6.8	M5×0.8	14.8	1.5	3.4	—	T15	3.5	<b>MMTE</b> Type Holder (⊕G019) <b>MMTI</b> Type Boring Bar (⊕G026) <b>HSK</b> Tool Holder (⊕H001)
	<b>SETS61</b>	8	M6×1	20	1.8	3.9	—	T20	5.0	
	<b>SLCS105</b>	10	M5×0.8	25	6.3	4	90°	—	7.0	<b>WP</b> Type Holder (⊕C017)
	<b>SLCS106</b>	12	M6×1	32	6.2	4	90°	—	7.0	
	<b>SPS1</b>	8.5	M5×0.8	16	4	4.5	70°	T25	5.0	
	<b>SRS5</b>	6.7	M5×0.8	16	3.5	3.9	—	T20	5.0	
	<b>STS1</b>	6.8	M3×0.5	7	2.2	2.8	90°	T10	2.5	

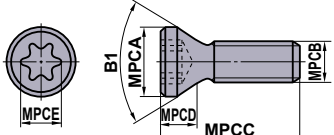
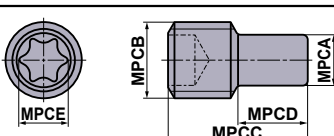
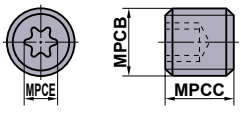
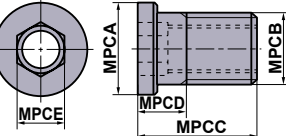
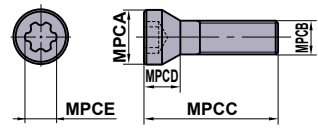
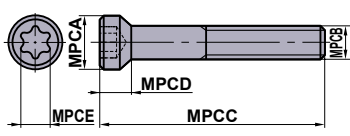
Geometry	Order Number	Dimensions (mm)					Angle	MPCDS	TQ (N·m)	Tool Holder
		MPCA	MPCB	MPCC	MPCD	MPCE				
	* TS16	2.5	M1.6×0.35	3.2	1.6	1.8	60°	T6	0.6	MICRO-DEX (☉E018)
	TS2	2.7	M2×0.4	4.6	1.4	1.8	60°	T6	0.6	
	* TS2A	2.7	M2×0.4	4.5	1.2	1.8	60°	T6	0.6	AQX (☉K172)
	TS2C	2.7	M2×0.4	3.8	1.4	1.8	60°	T6	0.6	
	☆ TS2D	3.8	M2×0.4	5.3	1.9	1.8	82°	T6	0.6	DIMPLE BAR (☉E007)
	TS21	2.7	M2×0.4	3.4	1.4	1.8	60°	T6	0.6	F Type Boring Bar (☉E029)
	* TS22	3.0	M2.2×0.45	5	1.2	1.8	60°	T6	0.6	S Type Boring Bar (☉E030)
	* TS25	3.3	M2.5×0.45	5.5	1.7	2.4	60°	T8	1.0	AQX (☉K172) AJX (☉K180)
	☆ TS25D	4.4	M2.5×0.45	6.2	2.2	2.4	82°	T8	1.0	MMTI Type Boring Bar (☉G026)
	* TS25H	3.6	M2.5×0.45	5.5	2	2.4	60°	T8	1.0	SRM2 (☉K220)
	TS202	2.7	M2×0.4	5.5	1.8	1.8	60°	T6	0.6	
	TS253	3.3	M2.5×0.45	4.5	1.7	2.4	60°	T8	1.0	Milling Tools Series (☉K001)
	TS254	3.3	M2.5×0.45	7	1.7	2.4	60°	T8	1.0	SMALL TOOLS (☉D001) PMF (☉K234)
	* TS255	3.5	M2.5×0.45	7.5	1.6	2.4	60°	T8	1.0	Profile Holder (☉C032)
		TS3	3.9	M3×0.5	6	2	2.4	60°	T8	1.0
TS304		3.9	M3×0.5	10.5	2.0	2.4	60°	T8	1.5	
TS3D		5.0	M3×0.5	6	2.3	2.8	82°	T10	2.5	DIMPLE BAR (☉E007)
* TS3SB		4.4	M3×0.5	8	2	2.4	80°	T8	1.5	AXD4000 (☉K155)
TS3SBS		4.4	M3×0.5	6.5	2	2.4	80°	T8	1.5	AXD4000 (☉K155)
☆ TS31D		4.8	M3×0.5	7.2	2.2	2.8	82°	T10	2.5	DIMPLE BAR (☉E007)
* TS32		3.9	M3×0.5	7.5	2	2.4	60°	T8	2.0	SRM2 (☉K220)
* TS33		3.9	M3×0.5	6.7	2	2.4	60°	T8	1.5	AQX (☉K172) AJX (☉K180)
TS35		4.8	M3.5×0.6	6.5	2.4	2.8	60°	T10	2.5	
* TS35D		5.3	M3.5×0.6	12	2.8	3.4	60°	T15	3.5	HSK Tool Holder (☉H001)
★ TS35R		5.7	M3.5×0.6	10	2.1	3.4	—	T15	3.5	AHX440S (☉K034) AHX475S (☉K038)
TS351		4.8	M3.5×0.6	7.2	2.4	2.8	60°	T10	2.5	AJX (☉K180) SRM2 (☉K220)
TS352		4.8	M3.5×0.6	10	3	2.8	60°	T10	2.5	VFX5 (☉K192)
TS4S		5.4	M4×0.7	7	2.4	3.4	80°	T15	3.5	
		* TS4SL	5.4	M4×0.7	8	2.4	3.4	80°	T15	4.0
	* TS4SB	5.8	M4×0.7	9	2.7	3.4	80°	T15	3.5	AXD7000 (☉K166)
	* TS4SBL	5.8	M4×0.7	10.5	2.7	3.4	80°	T15	3.5	GY SERIES (☉F004) AXD7000 (☉K166)
	TS4	5.4	M4×0.7	8	2.6	3.4	60°	T15	3.5	CE/CF/CGSP (☉K230) TSMP (☉K232)
	TS4D	5.6	M4×0.7	7.7	2.5	3.4	82°	T15	3.5	DIMPLE BAR (☉E007)
	TS42	5.4	M4×0.7	6	2.6	3.4	60°	T15	3.5	
	TS43	5.4	M4×0.7	10	2.6	3.4	60°	T15	3.5	AJX (☉K180) BRP (☉K190) SRM2 (☉K220)
	TS44	5.4	M4×0.7	12	2.6	3.4	60°	T15	3.5	
	TS406	5.4	M4×0.7	15.5	2.6	3.4	60°	T15	3.5	
	TS407	5.4	M4×0.7	9	2.6	3.4	60°	T15	3.5	AQX (☉K172) AJX (☉K180)
	TS450	5.9	M4.5×0.75	13	3.6	3.9	60°	T20	5.0	VFX6 (☉K196)
	TS5S	6.8	M5×0.8	9	2.9	4.5	80°	T25	7.5	
	* TS5SL	6.8	M5×0.8	12	2.9	4.5	80°	T25	7.5	
	TS5	6.8	M5×0.8	9	3.2	4.5	60°	T25	7.5	SP Holder (☉C024) CE/CF/CGSP (☉K230) TSMP (☉K232)
	TS5L	6.8	M5×0.8	15	2.9	4.5	80°	T25	7.5	
	★ TS5R	6.9	M5×0.8	12	3.5	3.9	—	T20	5.0	WWX400 (☉K056) WJX (☉K072)
	TS52	6.8	M5×0.8	8	3.2	4.5	60°	T25	7.5	CE/CF/CGSP (☉K230)
	TS53	6.8	M5×0.8	16	3.2	4.5	60°	T25	7.5	
	TS54	6.8	M5×0.8	12	3.2	4.5	60°	T25	7.5	AJX (☉K180)
	TS55	6.8	M5×0.8	10.5	3.2	4.5	60°	T25	7.5	GY SERIES (☉F004) AQX (☉K172) SPX (☉K203) SRM2 (☉K220)
	* TS6S	8.5	M6×1.0	13	4.4	5.6	60°	T30	10.0	AQX (☉K172) SRM2 (☉K220)
	* TS6	8.5	M6×1.0	16	4.4	5.6	60°	T30	10.0	SRM2 (☉K220)

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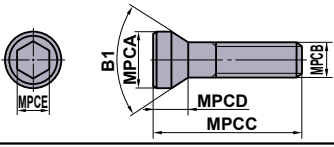
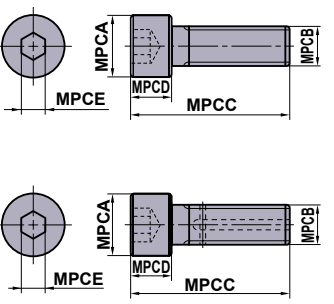
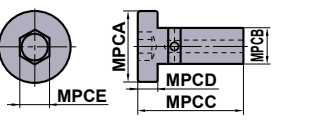
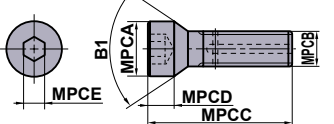
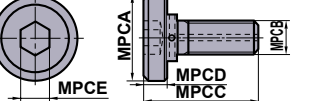
SPARE PARTS

# SPARE PARTS

## CLAMP SCREW

Geometry	Order Number	Dimensions (mm)					Angle B1	MPCDS	TQ (N·m)	Tool Holder
		MPCA	MPCB	MPCD	MPCD	MPCD				
	TPS20	2.7	M2×0.4	3.5	1.3	1.8	60°	6IP	0.5	
	TPS20-1	2.65	M2×0.4	4.7	2.4	1.8	60°	6IP	0.6	MVX (⊕M160)
	TPS22	3.0	M2.2×0.45	4.7	1.6	2.1	60°	7IP	0.5	
	TPS22S	3.0	M2.2×0.45	4.2	1.6	2.1	60°	7IP	0.5	
	TPS25	3.3	M2.5×0.45	5.5	1.7	2.1	60°	7IP	1.0	APX3000 (⊕K133) MVX (⊕M160)
	TPS25-1	3.3	M2.5×0.45	6.5	1.7	2.1	60°	7IP	1.0	APX3000 (⊕K133)
	TPS27F1	3.7	M2.7×0.35	6.5	1.8	2.1	60°	7IP	1.0	VPX200 (⊕K086)
	TPS27F2	3.7	M2.7×0.35	8.0	1.8	2.1	60°	7IP	1.0	VPX300 (⊕K100)
	TPS3	3.9	M3×0.5	6.7	1.4	2.82	60°	10IP	1.0	MVX (⊕M160)
	* TPS3R	4.6	M3×0.5	8.5	1.4	2.82	—	10IP	2.0	WJX09 (⊕K072)
	TPS3SB	4.4	M3×0.5	8	2.0	2.82	80°	10IP	3.0	AXD4000A (⊕K162)
	TPS35	5.3	M3.5×0.6	11.5	2.8	3.4	60°	15IP	3.5	ASX445 (⊕K026) ASX400 (⊕K068) PMR (⊕K236)
	TPS351	4.8	M3.5×0.6	7.2	1.4	2.82	60°	10IP	2.5	MVX (⊕M160)
	TPS351B	5.1	M3.5×0.6	7.2	1.4	2.82	60°	10IP	2.5	ARP (⊕K238)
	TPS4	5.3	M4×0.7	8	2.6	3.4	60°	15IP	3.5	APX4000 (⊕K140) ARP (⊕K238) MVX (⊕M160)
	TPS40F1	5.3	M4×0.5	10.5	2.8	3.4	60°	15IP	3.0	VPX300 (⊕K100)
TPS43	5.3	M4×0.7	10	2.6	3.4	60°	15IP	4.0	APX4000 (⊕K140) MVX (⊕M160)	
* TPS4R	6.4	M4×0.7	10.6	2.9	3.4	—	15IP	3.5	WSX445 (⊕K016)	
TPS54	6.8	M5×0.8	12	3.2	4.5	60°	25IP	7.5	MVX (⊕M160)	
	TSR05008S	3.5	M5×0.8	8	—	2.8	—	T10	—	
	TSR06011S	4	M6×1.0	11	—	3.9	—	T20	—	
	TSS04005	—	M4×0.7	5	—	2.4	—	T8	—	PMF (⊕K234)
	TSS04505S	—	M4.5×0.7	5	—	3.5	—	T10	3.5	FMAX (⊕K051)
	TSS05006	—	M5×0.8	6	—	2.8	—	T10	—	
	TSS06010	—	M6×1	10	—	3.9	—	T20	—	
	WCS503507H	6.3	M5×0.5	7	3.3	3.5	—	—	5.0	ASX445 (⊕K026) ASX400 (⊕K068) PMR (⊕K236)
	WCS604010H	7.8	M6×0.75	10	4.1	4.0	—	—	7.0	PMR (⊕K236)
	WS203107TPS	3.1	M2×0.25	7.3	1.7	1.8	60°	6IP	1.0	STAW (⊕M141)
	WS203108TPS	3.1	M2×0.25	8.3	1.9	1.8	60°	6IP	1.0	
	WS253909TPS	3.9	M2.5×0.35	9.5	2.4	2.4	60°	8IP	2.0	
	WS304912TPS	4.9	M3×0.35	12	3.25	2.82	60°	10IP	2.5	
	WS254012T	4	M2.5×0.45	11.5	2.2	2.4	80°	T8	2.0	TAW (⊕M150)
	WS254013T	4	M2.5×0.45	12.5	2.2	2.4	80°	T8	2.0	
	WS254014T	4	M2.5×0.45	13.5	2.2	2.4	80°	T8	2.0	
	WS254015T	4	M2.5×0.45	14.5	2.2	2.4	80°	T8	2.0	
	WS254016T	4	M2.5×0.45	15.5	2.2	2.4	80°	T8	2.0	
	WS304517T	4.5	M3×0.5	16.5	3.4	2.8	60°	T10	3.5	
	WS304518T	4.5	M3×0.5	17.5	3.4	2.8	60°	T10	3.5	
	WS355520T	5.5	M3.5×0.6	19.5	3.9	3.4	60°	T15	5.5	
	WS355521T	5.5	M3.5×0.6	20.5	3.9	3.4	60°	T15	5.5	
	WS406023T	6	M4×0.7	22.0	4.4	4.5	60°	T25	8.5	
	WS406024T	6	M4×0.7	23.0	4.4	4.5	60°	T25	8.5	
	WS508026T	8	M5×0.8	25.0	5.2	5.1	60°	T27	12.0	
WS508027T	8	M5×0.8	26.0	5.2	5.1	60°	T27	12.0		

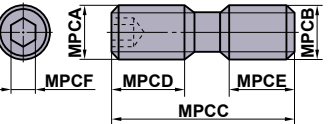
# SET BOLT

Geometry	Order Number	Dimensions (mm)					Angle	MPCDS	TQ (N·m)	Tool Holder
		MPCA	MPCB	MPCC	MPCD	MPCE				
	<b>BOES101</b>	15	M10×1.5	45	10	8	60°	—	10.0	
	* <b>HSC08025H</b>	13	M8×1.25	33	8	5	—	—	24	VPX200/300 (⊕K086,K100) ARP (⊕K238)
	<b>HSC05030</b>	8.5	M5×0.8	35	5	4	—	—	10	APX3000/4000 (⊕K133,K140)
	* <b>HSC08030H</b>	13	M8×1.25	38	8	5	—	—	24	WSX445 (⊕K016)
	<b>HSC08045</b>	13	M8×1.25	53	8	5	—	—	24	VPX200/300 (⊕K086,K100)
	<b>HSC08040</b>	13	M8×1.25	48	8	5	—	—	24	WSX445 (⊕K016)
	<b>HSC08050</b>	13	M8×1.25	58	8	5	—	—	24	VPX200/300 (⊕K086,K100)
	* <b>HSC10030H</b>	16	M10×1.5	40	10	6	—	—	40	APX3000/4000 (⊕K133,K140) AJX (⊕K180) WSX445 (⊕K016)
	<b>HSC10035</b>	16	M10×1.5	45	10	6	—	—	44	VFX5 (⊕K192) VFX6 (⊕K196)
	<b>HSC10050</b>	16	M10×1.5	60	10	8	—	—	44	APX3000/4000 (⊕K133,K140) VPX200/300 (⊕K086,K100)
	<b>HSC10055</b>	16	M10×1.5	65	10	8	—	—	44	VFX5 (⊕K192)
	<b>HSC10060</b>	16	M10×1.5	70	10	8	—	—	44	VPX200/300 (⊕K086,K100)
	<b>HSC10070</b>	16	M10×1.5	80	10	8	—	—	44	VPX200/300 (⊕K086,K100) ASPX (⊕K028)
	<b>HSC12035</b>	18	M12×1.75	47	12	10	—	—	80	WSX445 (⊕K016)
	* <b>HSC12035H</b>	18	M12×1.75	47	12	10	—	—	80	APX3000/4000 (⊕K133,K140) AJX (⊕K180)
	<b>HSC12040</b>	18	M12×1.75	52	12	10	—	—	80	
	<b>HSC12045</b>	18	M12×1.75	57	12	10	—	—	80	WSX445 (⊕K016)
	<b>HSC12060</b>	18	M12×1.75	72	12	10	—	—	80	VPX200/300 (⊕K086,K100)
	<b>HSC12070</b>	18	M12×1.75	82	12	10	—	—	80	APX3000/4000 (⊕K133,K140) AJX (⊕K180) WSX445 (⊕K016)
	<b>HSC16040</b>	24	M16×2	56	16	14	—	—	150	WSX445 (⊕K016)
	* <b>HSC16040H</b>	24	M16×2	56	16	14	—	—	150	APX3000/4000 (⊕K133,K140) AJX (⊕K180)
<b>HSC16055</b>	24	M16×2	71	16	14	—	—	150	VPX200/300 (⊕K086,K100)	
<b>HSC16065</b>	24	M16×2	81	16	14	—	—	150	VPX200/300 (⊕K086,K100)	
<b>HSC16080</b>	24	M16×2	96	16	14	—	—	150		
<b>HSC20040</b>	30	M20×2.5	60	20	17	—	—	320		
<b>HSC20090</b>	30	M20×2.5	110	20	17	—	—	320		
	<b>HSCX12030H</b>	24	M12×1.75	37	7	8	—	—	40	FMAX (⊕K051)
	<b>HSCX16035H</b>	30	M16×2	44	9	12	—	—	100	
	<b>HSCX20035H</b>	36	M20×2.5	46	11	14	—	—	180	
	<b>HFF08033H</b>	11	M8×1.25	33	5	5	90°	—	8.2	WJX09 (⊕K072)
	<b>HFF08043H</b>	11	M8×1.25	43	5	5	90°	—	8.2	AXD4000 (⊕K155)
	<b>MBA16033H</b>	40	M16×2	43	10	14	—	—	150	AHX640 (For φ100) (⊕K041) WSX445 (⊕K016)
	<b>MBA20040H</b>	50	M20×2.5	54	14	17	—	—	320	APX4000 (⊕K140) AHX475S (⊕K038) AHX640S (⊕K041) AXD4000 (⊕K155) AXD7000 (⊕K166) AJX (⊕K180)

\* With coolant hole.

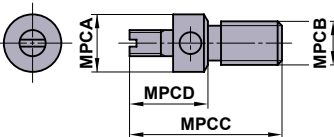
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SPARE PARTS

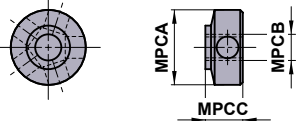
Geometry	Order Number	Dimensions (mm)						TQ (N·m)	Tool Holder
		MPCA	MPCB	MPCC	MPCD	MPCE	MPCF		
	<b>HDS08030</b>	M8×0.75	M8×1.25	30	13.5	11.5	4	8.2	BRP (⊕K190)
	<b>HDS10031</b>	M10×1.0	M10×1.5	31	14	12	5	9.0	PMF (⊕K234)

# SPARE PARTS

## LARGE ADJUSTMENT SCREW

Geometry	Order Number	Dimensions (mm)					Angle	MPCDS	TQ (N·m)	Tool Holder
		MPCA	MPCB	MPCC	MPCD	MPCE	B1			
	<b>KSS2</b>	6.6	M5×0.8	17.5	9	—	—	—	<b>FMAX</b> (K051)	

## MICRO ADJUSTMENT NUT

Geometry	Order Number	Dimensions (mm)					Angle	MPCDS	TQ (N·m)	Tool Holder
		MPCA	MPCB	MPCC	MPCD	MPCE	B1			
	<b>KSN3</b>	8.6	M3×0.35	4.3	—	—	—	—	<b>FMAX</b> (K051)	

# SHIM

Geometry	Order Number	Dimensions (mm)						Tool Holder
		MPCA	MPCB	MPCC	MPCD	MPCE	MPCF	
	CS32	9.52	3.18	0.8	0.8	1.2	1.2	
	CS42	12.70	3.18	0.8	0.8	1.2	1.6	
	CS43	12.70	4.76	0.8	0.8	1.2	1.6	
	* PS31	8.28	2.38	0.2	0.2	0.6	0.6	
	* PS42	11.46	3.18	0.2	0.2	0.6	1.0	
	CT22	6.35	3.18	0.4	0.8	1.2	—	F Type Boring Bar (E028)
	CT32	9.52	3.18	0.4	0.8	1.2	—	
	* PT21	5.11	2.38	0.2	0.2	0.6	—	
	* PT32	8.28	3.18	0.2	0.2	0.6	—	
	* PT42	10.85	3.18	0.3	0.3	0.7	—	
	DCSVN32	9.52	3.18	0.8	1.2	—	—	DOUBLE CLAMP Holder (C019) DOUBLE CLAMP DIMPLE BAR (E017)
	ESS42	12.70	3.18	0.8	0.8	1.2	1.6	
	EST32	9.52	3.18	0.4	0.8	1.2	—	
	EST43	12.70	4.76	0.4	0.8	1.2	—	
	LLSCN3T3	9.52	3.97	0.4	0.4	0.8	0.8	LL Type Holder (C008)
	LLSCN33	9.52	4.76	0.4	0.4	0.8	0.8	LL Type Holder (C008)
	LLSCN42	12.70	3.18	0.8	0.8	1.2	1.2	DOUBLE CLAMP DIMPLE BAR (E015)
	LLSCN53	15.87	4.76	1.2	1.2	1.6	1.6	P Type Boring Bar (E038)
	LLSCN63	19.05	4.76	1.2	1.2	1.6	1.6	HSK Tool Holder (H001)
	* LLSCP42	12.70	3.18	0.8	0.8	1.2	1.2	DOUBLE CLAMP DIMPLE BAR (E015)
	* LLSCP63	19.05	4.76	1.2	1.2	1.6	1.6	P Type Boring Bar (E038)
	LLSDN32	9.52	3.18	0.8	1.2	—	—	DOUBLE CLAMP Holder (C010)
	LLSDN42	12.70	3.18	0.8	1.2	—	—	LL Type Holder (C010)
	LLSDN43	12.70	4.76	0.8	1.2	—	—	DOUBLE CLAMP DIMPLE BAR (E015)
	LLSDN53	15.87	4.76	1.2	1.6	—	—	P Type Boring Bar (E038)
	* LLSDP42	12.70	3.18	0.8	1.2	—	—	DOUBLE CLAMP DIMPLE BAR (E015)
	LLSRN103	8.3	3.18	—	—	—	—	LL Type Holder (C026)
	LLSRN123	9.8	3.18	—	—	—	—	HSK Tool Holder (H001)
	LLSRN164	13.6	4.76	—	—	—	—	
	LLSRN204	17.3	4.76	—	—	—	—	
	LLSRN256	22.0	6.35	—	—	—	—	
	LLSRN326	28.0	6.35	—	—	—	—	
	LLSSN32	9.52	3.18	0.8	0.8	1.2	1.2	DOUBLE CLAMP DIMPLE BAR (E016)
	LLSSN33	9.52	4.76	0.8	0.8	1.2	1.2	P Type Boring Bar (E037)
	LLSSN42	12.70	3.18	0.8	0.8	1.2	1.6	
	LLSSN53	15.87	4.76	1.2	1.2	1.6	1.6	
	LLSSN63	19.05	4.76	1.2	1.2	1.6	2.0	
* LLSSP42	12.70	3.18	0.8	0.8	1.2	1.6	DOUBLE CLAMP DIMPLE BAR (E016)	

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SPARE PARTS

# SPARE PARTS

## SHIM

Geometry	Order Number	Dimensions (mm)						Tool Holder
		MPCA	MPCB	MPCC	MPCD	MPCE	MPCF	
	LLSTE32	7.6	3.18	0.4	0.4	0.4	—	LL Type Holder (☉C016) <b>DOUBLE CLAMP DIMPLE BAR</b> (☉E016) P Type Boring Bar (☉E037)
	LLSTN32	9.52	3.18	0.4	0.8	1.2	—	
	LLSTN33	9.52	4.76	0.4	0.8	1.2	—	
	LLSTN42	12.70	3.18	0.4	0.8	1.2	—	
	LLSTN53	15.87	4.76	0.8	1.2	1.6	—	
	* LLSTP32	9.52	3.18	0.4	0.8	1.2	—	
* LLSTP42	12.70	3.18	0.4	0.8	1.2	—		
	LLSWN32	9.52	3.18	0.4	0.8	1.2	—	LL Type Holder (☉C022) <b>DOUBLE CLAMP</b> Holder (☉C022) <b>DOUBLE CLAMP DIMPLE BAR</b> (☉E017)
	LLSWN3T3	9.52	3.97	0.4	0.8	1.2	—	
	LLSWN42	12.70	3.18	0.4	0.8	1.2	—	
	* LLSWP32	9.52	3.18	0.4	0.8	1.2	—	
	* LLSWP42	12.70	3.18	0.4	0.8	1.2	—	
	MHS532R/L	9.4	15.7	4.5	0.8	0.8	—	
	MHS533R/L	9.4	15.7	4.5	1.2	1.2	—	
	MHS534R/L	9.4	15.7	4.5	1.6	1.6	—	
	MHS543R/L	9.4	15.7	6.5	1.2	1.2	—	
<p>Hole position of this item is offset from centre.</p>	MLCP42	12.58	3.18	1.2	1.2	1.2	1.2	P Type Boring Bar (☉E038)
<p>Hole position of this item is offset from centre.</p>	MLDP42	12.56	3.18	1.2	1.2	—	—	P Type Boring Bar (☉E038)
<p>Hole position of this item is offset from centre.</p>	MLSP42	12.63	3.18	1.2	1.2	1.2	1.2	P Type Boring Bar (☉E037)
<p>Hole position of this item is offset from centre.</p>	MLTP32	9.50	3.18	1.2	1.2	1.2	—	P Type Boring Bar (☉E037)
	MSCN63	18.8	4.76	1.6	1.6	1.6	1.6	<b>DOUBLE CLAMP</b> Holder (☉C009) (For Heavy Cutting)
	MSSN63	18.8	4.76	1.6	1.6	1.6	1.6	<b>DOUBLE CLAMP</b> Holder (☉C012) (For Heavy Cutting)
	CT32T1	9.525	15.03	3.18	—	—	—	
	* PT32T1R	8.28	13.34	3.18	—	—	—	
	* PT32T2R	8.28	13.19	3.18	—	—	—	



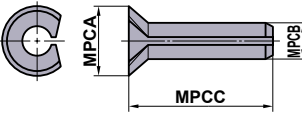
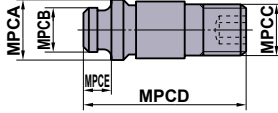
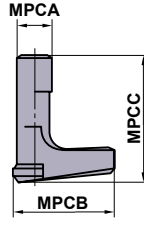
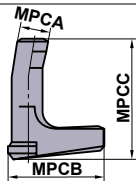
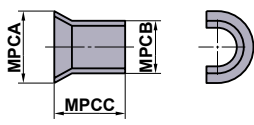
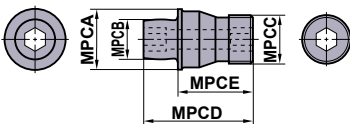
Geometry	Order Number	Dimensions (mm)						Tool Holder
		MPCA	MPCB	MPCC	MPCD	MPCE	MPCF	
	<b>PV321</b>	9.52	3.18	0.4	0.4	—	—	<b>MP</b> Type Holder (☉C019)
	<b>PV322</b>	9.52	3.18	0.8	0.8	—	—	
	<b>PV323</b>	9.52	3.18	1.2	1.2	—	—	
	<b>SPSVN32</b>	8.06	3.18	0.3	0.3	—	—	<b>SP</b> Type Holder (☉C030) <b>HSK</b> Tool Holder (☉H001)
	<b>STASX400N</b>	11.00	3.00	0.4	0.4	0.4	0.4	<b>ASX400</b> (☉K068)
	<b>STASX445N</b>	10.76	3.00	—	—	—	—	<b>ASX445</b> (☉K026)
	<b>STBS500N</b>	12.7	3.18	0.8	0.8	0.8	0.8	
	<b>WPSTN33</b>	9.3	4.76	0.8	0.4	1.2	—	<b>WP</b> Type Holder (☉C017)
	<b>WPSTN43</b>	12.50	4.76	0.8	0.4	1.2	—	
	* <b>WPSWC43</b>	12.50	4.76	0.4	0.8	1.2	—	<b>WP</b> Type Holder (☉C023)
	* <b>WPSWN43</b>	12.50	4.76	0.4	0.8	1.2	—	

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**SPARE PARTS**

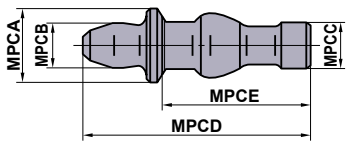
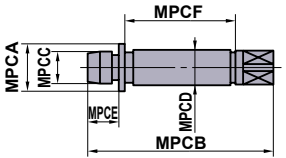
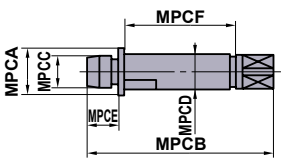
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## SHIM PIN AND CLAMP LEVER

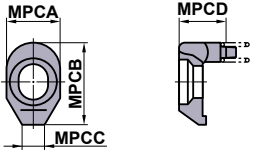
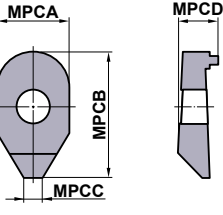
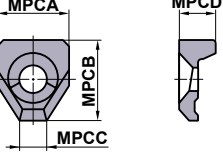
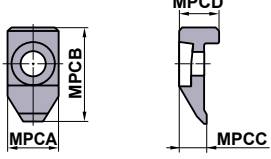
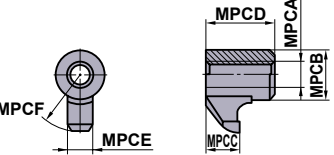
Geometry	Order Number	Dimensions (mm)					Tool Holder
		MPCA	MPCB	MPCC	MPCD	MPCE	
	<b>BCP141</b>	3.0	1.4	5.6	—	—	<b>SP</b> Type Holder (☉C030) <b>F</b> Type Boring Bar (☉E028) <b>HSK</b> Tool Holder (☉H013)
	<b>BCP201</b>	4.3	2	7.4	—	—	
	<b>BCP202</b>	4.3	2	6.4	—	—	
	<b>BCP251</b>	4.8	2.5	7.4	—	—	
	<b>BCP252</b>	4.8	2.5	6.4	—	—	
	<b>BCP301</b>	5.3	3	7.4	—	—	
	<b>CCP33</b>	6.5	3.66	M5×0.8	18.5	3	<b>WP</b> Holder (☉C017)
	<b>CCP34</b>	7.5	5.0	M6×1.0	18.5	3	
	<b>CCP44</b>	7.5	5.0	M5×0.8	14.2	3	
	<b>LLCL12S</b>	2.1	9.3	5.6	—	—	<b>LL</b> Type Holder (☉C016) <b>P</b> Type Boring Bar (☉E037) <b>HSK</b> Tool Holder (☉H001)
	<b>LLCL13</b>	3.6	10	12.5	—	—	
	<b>LLCL13S</b>	3.6	10	7.8	—	—	
	<b>LLCL14</b>	4.7	13.4	13.2	—	—	
	<b>LLCL14S</b>	4.7	13.6	12.2	—	—	
	<b>LLCL15</b>	6.0	19	17	—	—	
	<b>LLCL16</b>	7.5	20.8	21	—	—	
	<b>LLCL18</b>	8.6	25.4	25.2	—	—	
	<b>LLCL23</b>	3.6	12.0	11.5	—	—	
	<b>LLCL23S</b>	3.6	11.6	9.5	—	—	
	<b>LLCL24</b>	4.7	16.2	14.8	—	—	
	<b>LLCL25</b>	6.0	17.1	17	—	—	
		<b>LLCL110</b>	3.0	10.7	11.6	—	
<b>LLCL112</b>		3.5	13	13.5	—	—	
<b>LLCL116</b>		4.5	18.5	18	—	—	
<b>LLCL120</b>		5.6	20.3	19	—	—	
<b>LLCL125</b>		6	24	24	—	—	
<b>LLCL132</b>		8	30	27	—	—	
	<b>LLP13</b>	5.55	4.85	5.3	—	—	<b>LL</b> Type Holder (☉C008) <b>DOUBLE CLAMP</b> Holder (☉C008) <b>DOUBLE CLAMP DIMPLE BAR</b> (☉E015) <b>P</b> Type Boring Bar (☉E037) <b>HSK</b> Tool Holder (☉H001)
	<b>LLP14</b>	7.25	6.55	5.8	—	—	
	<b>LLP15</b>	8.8	8.05	8.6	—	—	
	<b>LLP16</b>	10.85	9.85	11.1	—	—	
	<b>LLP18</b>	15.35	13.05	12.0	—	—	
	<b>LLP23</b>	5.55	4.85	6.8	—	—	
	<b>LLP24</b>	7.25	6.55	9.1	—	—	
	<b>MP6</b>	11.9	7.8	M10×1	22.1	15	<b>DOUBLE CLAMP</b> Holder (☉C009) (For Heavy Cutting)

SPARE PARTS Z

## LOCK PIN

Geometry	Order Number	Dimensions (mm)						Tool Holder
		MPCA	MPCB	MPCC	MPCD	MPCE	MPCF	
	<b>P11S</b>	6	3.7	4	17	11.1	—	MP Type Holder (C019)
	<b>P21S</b>	7.5	4.9	4.5	17.2	11.5	—	
	<b>P221US</b>	4	18	2.11	3.5	3.3	7.7	
	<b>P333WS</b>	5.75	24	3.64	5.0	4.9	11.3	
	<b>P434W</b>	7.75	30	5.03	7.0	4.9	16.8	

## CLAMP BRIDGE

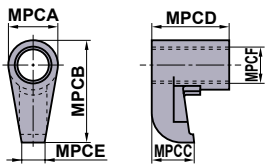
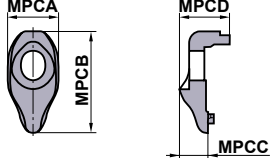
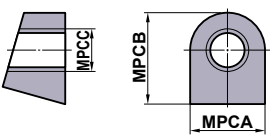
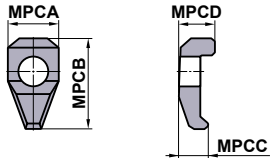
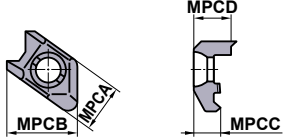
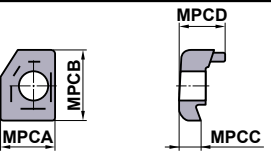
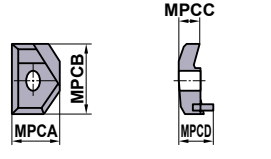
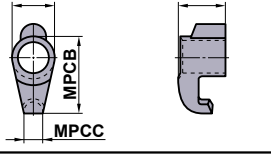
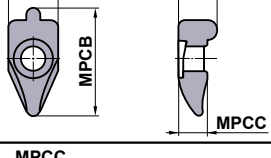
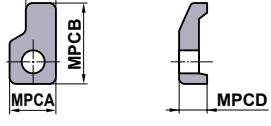
Geometry	Order Number	Dimensions (mm)						Tool Holder
		MPCA	MPCB	MPCC	MPCD	MPCE	MPCF	
	<b>AMS3</b>	7	12	3	3.3	—	—	Profile Holder (C032) AJX (K180)
	<b>AMS4</b>	9	13.5	3	3.8	—	—	
	<b>AMS5</b>	10	15	3.5	5	—	—	
	<b>CA142</b>	8	15	4	7	—	—	
	<b>CA150</b>	9	16	4.5	7	—	—	
	<b>CA151</b>	10	17	5	7	—	—	
	<b>CA152</b>	10	19	5	7	—	—	
	<b>CA153</b>	10	24	5	7	—	—	
	<b>CA161</b>	13	20	6	8	—	—	
	<b>CA162</b>	13	24	6	8	—	—	
	<b>CA163</b>	13	27	6	8	—	—	
	<b>CA181</b>	16	30	8	10	—	—	
<b>CA183</b>	16	37	8	10	—	—		
	<b>CCK13</b>	15	18.5	6	9	—	—	WP Type Holder (C017)
	<b>CCK14</b>	19	22	8	9.5	—	—	
	<b>CCTC1</b>	13	25	7	10.2	—	—	
	<b>CK231</b>	M6×1	8	4	7.5	4.5	9.5	
	<b>CK232</b>	M6×1	8	4.5	8	4.5	11.5	
	<b>CK341</b>	M8×1	11	5.5	13.5	6	13.5	
	<b>CK342</b>	M8×1	11	6	14	6	16.5	

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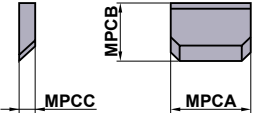
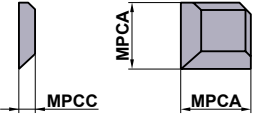
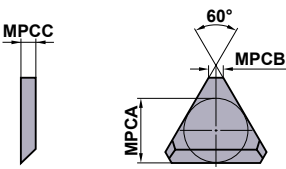
SPARE PARTS

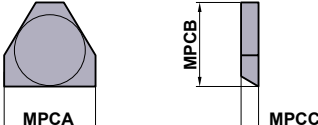
# SPARE PARTS

## CLAMP BRIDGE

Geometry	Order Number	Dimensions (mm)						Tool Holder
		MPCA	MPCB	MPCC	MPCD	MPCE	MPCF	
	<b>CKW6</b>	10.9	22.5	9.2	16.8	5	M8×1	<b>DOUBLE CLAMP</b> Holder (☉C009) (For Heavy Cutting)
	<b>DCK2211</b> <b>DCK2613</b> <b>DCK3113</b>	11 13 13	22 26.5 31	6.57 7.35 9	11.1 12.9 14.5	— — —	— — —	<b>DOUBLE CLAMP</b> Holder (☉C008) <b>DOUBLE CLAMP DIMPLE BAR</b> (☉E015) HSK Tool Holder (☉H001)
	<b>KGC1</b>	12.0	15.0	M7×0.75	—	—	—	
	<b>LK1</b>	8	14.3	4.5	5.9	—	—	
	<b>MHK5NR/L</b>	15.5	23.5	8.1	12.1	—	—	
	<b>MTK1R/L</b>	13	17.5	5	12	—	—	<b>MG</b> Type Holder (☉F124) <b>MT</b> Type Holder (☉G024) HSK Tool Holder (☉H001)
	<b>MTK2R/L</b>	18	28	7	14	—	—	
	<b>SETK51</b> <b>SETK61</b>	6.8 8.9	14.5 18.1	2.9 4.1	8 8.6	— —	— —	<b>MMTE</b> Type Holder (☉G019) <b>MMTI</b> Type Holder (☉G026) HSK Tool Holder (☉H001)
	<b>SRK1R</b>	9.4	21	5.5	7.5	—	—	
	<b>UCR</b>	12	24	8	7	—	—	

## BREAKER PIECE

Geometry	Order Number	Dimensions (mm)					Tool Holder
		MPCA	MPCB	MPCC	IC	LBB	
	<b>CBS3</b>	9.4	8.0	1.5	9.525	1.5	
	<b>CBS4</b>	12.6	9.2	2.5	12.70	3.5	
	<b>CBS4N</b>	12.6	10.2	2.5	12.70	2.5	
	<b>CBS4F</b>	12.6	11.2	2.5	12.70	1.5	
	<b>CBS6</b>	18.9	14.6	2.5	19.05	4.5	
	<b>CBS6F</b>	18.9	17.6	2.5	19.05	1.5	
	<b>CBS3D</b>	8.0	—	1.5	9.525	1.5	
	<b>CBS4D</b>	10.2	—	2.5	12.70	2.5	
	<b>CBT2N</b>	5.67	1.4	1.5	6.35	1.0	<b>F</b> Type Boring Bar (E028) *For positive inserts, the breaker width is 0.5mm larger than the figures in the list.
	<b>CBT3</b>	7.20	1.4	2.5	9.525	3.5	
	<b>CBT3N</b>	7.87	1.4	2.5	9.525	2.5	
	<b>CBT3F</b>	8.53	1.4	2.5	9.525	1.5	
	<b>CBT4N</b>	11.07	1.4	2.5	12.70	2.5	
	<b>CBT4F</b>	11.73	1.4	2.5	12.70	1.5	

Geometry	Order Number	Dimensions (mm)			MPCD (mm)	Tool Holder
		MPCA	MPCB	MPCC		
	<b>CBT3106</b>	11.5	10.6	2.0	2.5—3.0	
	<b>CBT3113</b>	11.5	11.3	2.0	1.5—2.0	
	<b>CBT3120</b>	11.5	12	2.0	0.75—1.25	

**N**

SPARE PARTS

# ANTI SEIZE LUBRICANT

## ANTI SEIZE LUBRICANT

Shape	Order Number	Stock	Volume (g)
	MK1K	★	20
	MK1KS	★	3

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# ISO13399 COMPLIANCE

## List of Property Symbols Complying with ISO13399

Alphabetical

Source: ISO13399 standard

URL : <https://www.iso.org/search/x/query/13399>

ISO13399 Property Symbols	Content
<b>ADJLX</b>	Adjustment limit maximum
<b>ADJRG</b>	Adjustment range
<b>ALF</b>	Clearance angle radial
<b>ALP</b>	Clearance angle axial
<b>AN</b>	Clearance angle major
<b>ANN</b>	Clearance angle minor
<b>APMX</b>	Depth of cut maximum
<b>AS</b>	Clearance angle wiper edge
<b>ASP</b>	Adjusting screw protrusion
<b>AZ</b>	Plunge depth maximum
<b>B</b>	Shank width
<b>BBD</b>	Balanced by design
<b>BCH</b>	Corner chamfer length
<b>BD</b>	Body diameter
<b>BDX</b>	Body diameter maximum
<b>BHCC</b>	Bolt hole circle count
<b>BHTA</b>	Body half taper angle
<b>BMC</b>	Body material code
<b>BS</b>	Wiper edge length
<b>BSR</b>	Wiper edge radius
<b>CASC</b>	Cartridge size code
<b>CB</b>	Chipbreaker face count
<b>CBDP</b>	Connection bore depth
<b>CBMD</b>	Chipbreaker manufacturers designation
<b>CBP</b>	Chipbreaker property
<b>CCMS</b>	Connection code machine side
<b>CCWS</b>	Connection code workpiece side
<b>CCP</b>	Chamfer corner property
<b>CDI</b>	Insert cutting diameter
<b>CDX</b>	Cutting depth maximum
<b>CEATC</b>	Tool cutting edge angle type code
<b>CECC</b>	Cutting edge condition code
<b>CEDC</b>	Cutting edge count
<b>CF</b>	Spot chamfer
<b>CHW</b>	Corner chamfer width
<b>CICT</b>	Cutting item count
<b>CNC</b>	Corner count
<b>CND</b>	Coolant entry diameter
<b>CNSC</b>	Coolant entry style code
<b>CNT</b>	Coolant entry thread size
<b>CP</b>	Coolant pressure
<b>CRE</b>	Spot radius
<b>CRKS</b>	Connection retention knob thread size
<b>CSP</b>	Coolant supply property
<b>CTP</b>	Coating property
<b>CTX</b>	Cutting point translation X-direction
<b>CTY</b>	Cutting point translation Y-direction
<b>CUTDIA</b>	Work piece parting diameter maximum
<b>CUB</b>	Connection unit basis
<b>CW</b>	Cutting width
<b>CWX</b>	Cutting width maximum
<b>CXD</b>	Coolant exit diameter



ISO13399 Property Symbols	Content
<b>CXSC</b>	Coolant exit style code
<b>CZC</b>	Connection size code
<b>D1</b>	Fixing hole diameter
<b>DAH</b>	Diameter access hole
<b>DAXN</b>	Axial groove outside diameter minimum
<b>DAXX</b>	Axial groove outside diameter maximum
<b>DBC</b>	Diameter bolt circle
<b>DC</b>	Cutting diameter
<b>DCB</b>	Connection bore diameter
<b>DCBN</b>	Connection bore diameter minimum
<b>DCBX</b>	Connection bore diameter maximum
<b>DCC</b>	Design configuration style code
<b>DCCB</b>	Counterbore diameter connection bore
<b>DCIN</b>	Cutting diameter internal
<b>DCINN</b>	Cutting diameter internal minimum
<b>DCINX</b>	Cutting diameter internal maximum
<b>DCN</b>	Cutting diameter minimum
<b>DCON</b>	Connection diameter
<b>DCONMS</b>	Connection diameter machine side
<b>DCONWS</b>	Connection diameter workpiece side
<b>DCSC</b>	Cutting diameter size code
<b>DCSFMS</b>	Contact surface diameter machine side
<b>DCX</b>	Cutting diameter maximum
<b>DF</b>	Flange diameter
<b>DHUB</b>	Hub diameter
<b>DMIN</b>	Minimum bore diameter
<b>DMM</b>	Shank diameter
<b>DN</b>	Neck diameter
<b>DRVA</b>	Drive angle
<b>EPSR</b>	Insert included angle
<b>FHA</b>	Flute helix angle
<b>FHCSA</b>	Fixing hole countersunk angle
<b>FHCSD</b>	Fixing hole countersunk diameter
<b>FLGT</b>	Flange thickness
<b>FMT</b>	Form type
<b>FXHLP</b>	Fixing hole property
<b>GAMF</b>	Rake angle radial
<b>GAMN</b>	Rake angle normal
<b>GAMO</b>	Rake angle orthogonal
<b>GAMP</b>	Rake angle axial
<b>GAN</b>	Insert rake angle
<b>H</b>	Shank height
<b>HA</b>	Thread height theoretical
<b>HAND</b>	Hand
<b>HBH</b>	Head bottom offset height
<b>HBKL</b>	Head back offset length
<b>HBKW</b>	Head back offset width
<b>HBL</b>	Head bottom offset length
<b>HC</b>	Thread height actual
<b>HF</b>	Functional height
<b>HHUB</b>	Hub height
<b>HTB</b>	Body height
<b>IC</b>	Inscribed circle diameter
<b>IFS</b>	Insert mounting style code
<b>IIC</b>	Insert interface code
<b>INSL</b>	Insert length
<b>KAPR</b>	Tool cutting edge angle
<b>KCH</b>	Corner chamfer angle

# TECHNICAL DATA

ISO13399 Property Symbols	Content
<b>KRINS</b>	Cutting edge angle major
<b>KWW</b>	Keyway width
<b>KYP</b>	Keyway property
<b>L</b>	Cutting edge length
<b>LAMS</b>	Inclination angle
<b>LB</b>	Body length
<b>LBB</b>	Chipbreaker width
<b>LBX</b>	Body length maximum
<b>LCCB</b>	Counterbore depth connection bore
<b>LCF</b>	Length chip flute
<b>LDRED</b>	Reduced body diameter length
<b>LE</b>	Cutting edge effective length
<b>LF</b>	Functional length
<b>LFA</b>	a dimension on lf
<b>LH</b>	Head length
<b>LPR</b>	Protruding length
<b>LS</b>	Shank length
<b>LSC</b>	Clamping length
<b>LSCN</b>	Clamping length minimum
<b>LSCX</b>	Clamping length maximum
<b>LTA</b>	LTA length (length from MCS to CRP)
<b>LU</b>	Usable length
<b>LUX</b>	Usable length maximum
<b>M</b>	m-dimension
<b>M2</b>	Distance between the nominal inscribed circle and the corner of an insert that has the secondary included angle
<b>MHA</b>	Mounting hole angle
<b>MHD</b>	Mounting hole distance
<b>MHH</b>	Mounting hole height
<b>MIID</b>	Master insert identification
<b>MTP</b>	Clamping type code
<b>NCE</b>	Cutting end count
<b>NOF</b>	Flute count
<b>NOI</b>	Insert index count
<b>NT</b>	Tooth count
<b>OAH</b>	Overall height
<b>OAL</b>	Overall length
<b>OAW</b>	Overall width
<b>PDPT</b>	Profile depth insert
<b>PDX</b>	Profile distance ex
<b>PDY</b>	Profile distance ey
<b>PFS</b>	Profile style code
<b>PL</b>	Point length
<b>PNA</b>	Profile included angle
<b>PRFRAD</b>	Profile radius
<b>PSIR</b>	Tool lead angle
<b>PSIRL</b>	Cutting edge angle major left hand
<b>PSIRR</b>	Cutting edge angle major right hand
<b>RAL</b>	Relief angle left hand
<b>RAR</b>	Relief angle right hand
<b>RCP</b>	Rounded corner property
<b>RE</b>	Corner radius
<b>REL</b>	Corner radius left hand
<b>RER</b>	Corner radius right hand
<b>RMPX</b>	Ramping angle maximum
<b>RPMX</b>	Rotational speed maximum
<b>S</b>	Insert thickness
<b>S1</b>	Insert thickness total
<b>SC</b>	Insert shape code
<b>SDL</b>	Step diameter length
<b>SIG</b>	Point angle

ISO13399 Property Symbols	Content
<b>SSC</b>	Insert seat size code
<b>SX</b>	Shank cross section shape code
<b>TC</b>	Tolerance class insert
<b>TCE</b>	Tipped cutting edge code
<b>TCTR</b>	Thread tolerance class
<b>TD</b>	Thread diameter
<b>THFT</b>	Thread form type
<b>THL</b>	Threading length
<b>THLGTH</b>	Thread length
<b>THSC</b>	Tool holder shape code
<b>THUB</b>	Hub thickness
<b>TP</b>	Thread pitch
<b>TPI</b>	Threads per inch
<b>TPIN</b>	Threads per inch minimum
<b>TPIX</b>	Threads per inch maximum
<b>TPN</b>	Thread pitch minimum
<b>TPT</b>	Thread profile type
<b>TPX</b>	Thread pitch maximum
<b>TQ</b>	Torque
<b>TSYC</b>	Tool style code
<b>TTP</b>	Thread type
<b>ULDR</b>	Usable length diameter ratio
<b>UST</b>	Unit system
<b>W1</b>	Insert width
<b>WEP</b>	Wiper edge property
<b>WF</b>	Functional width
<b>WF2</b>	Distance between the cutting reference point and the front seating surface of a turning tool
<b>WFS</b>	Functional width secondary
<b>WT</b>	Weight of item
<b>ZEFF</b>	Face effective cutting edge count
<b>ZEFP</b>	Peripheral effective cutting edge count
<b>ZNC</b>	Cutting edge center count
<b>ZNF</b>	Face mounted insert count
<b>ZNP</b>	Peripheral mounted insert count

## List of Reference Symbols Complying with ISO13399

ISO13399 Reference Symbols	Content
<b>CIP</b>	Coordinate system In Process
<b>CRP</b>	Cutting Reference Point
<b>CSW</b>	Coordinate System Workpiece side
<b>MCS</b>	Mounting Coordinate System
<b>PCS</b>	Primary Coordinate System

# TROUBLE SHOOTING FOR TURNING

Trouble		Solution	Insert Grade Selection				Cutting Conditions				Style and Design of the Tool					Machine, Installation of Tool						
			Select a harder grade	Select a tougher grade	Select a grade with better thermal shock resistance	Select a grade with better adhesion resistance	Cutting speed	Feed	Depth of cut	Coolant		Select chipbreaker	Rake	Corner radius	Lead angle	Honing strengthens the cutting edge	Class of insert	Improve tool holder rigidity	Increase clamping rigidity of the tool and workpiece	Decrease holder overhang	Decrease power and machine backlash	
										Do not use water-soluble cutting fluid	Determine dry or wet cutting											Up ↗
Deterioration of Tool Life	Insert wear quickly generated	Improper tool grade	●																			
		Improper cutting edge geometry									●	↗	↗	↗	●	↘						
		Improper cutting speed					↘	↗			●	Wet										
	Chipping or fracturing of cutting edge	Improper tool grade		●																		
		Improper cutting conditions						↘	↘													
		Lack of cutting edge strength.									●		↗		↗							
		Thermal crack occurs			●		↘	↘	↘	●	●	Dry										
Build-up edge occurs					●	↗	↗		●	●	Wet											
Lack of rigidity															●	●	●	●				
Out of Tolerance	Dimensions are not constant	Poor insert accuracy													●							
		Large cutting resistance and cutting edge flank									●	●	↘	↘	↘	●	●	●	●			
	Necessary to adjust often because of over-size	Improper tool grade	●																			
Deterioration of Surface Finish	Poor finished surface	Improper cutting conditions					↘	↗														
		Welding occurs					↗			●	●	Wet										
		Improper cutting edge geometry									●		↗									
Generation of Heat	Workpiece over heating can cause poor accuracy and short life of insert	Chattering					↘	↘	↘						●	●	●	●				
		Improper cutting conditions					↘	↘	↘													
		Improper cutting edge geometry								●	↗			↘								

Trouble		Solution	Insert Grade Selection				Cutting Conditions				Style and Design of the Tool					Machine, Installation of Tool				
			Select a harder grade	Select a tougher grade	Select a grade with better thermal shock resistance	Select a grade with better adhesion resistance	Cutting speed	Feed	Depth of cut	Coolant	Chipbreaker	Rake	Corner radius	Lead angle	Honing strengthens the cutting edge	Class of insert	Improve tool holder rigidity	Increase clamping rigidity of the tool and workpiece	Decrease holder overhang	Decrease power and machine backlash
Factors						Up ↗	Down ↘		Do not use water-soluble cutting fluid	Determine dry or wet cutting	Up ↗	Down ↘								
Burrs, Chipping etc.	Burrs (Steel, Aluminium)	Notch wear	●																	
		Improper cutting conditions					↘ ●	↗ ●			● Wet									
		Improper cutting edge geometry										●	↗ ●	↘ ●	↘ ●	↘ ●				
	Workpiece chipping (Cast iron)	Improper cutting conditions					↘ ●	↘ ●				●	↗ ●	↗ ●	↗ ●	↘ ●				
		Improper cutting edge geometry										●	↗ ●	↗ ●	↗ ●	↘ ●				
		Vibration occurs														●	●	●	●	
	Burrs (Mild steel)	Improper tool grade			●															
		Improper cutting conditions					↗ ●			●	● Wet									
		Improper cutting edge geometry										●	↗ ●		↘ ●					
		Vibration occurs														●	●	●	●	
	Poor Chip Dispersal	Long chips	Improper cutting conditions				↘ ●	↗ ●	↗ ●		● Wet									
			Large chip control range									●								
Improper cutting edge geometry													↘ ●	↘ ●						
Chips are short and scattered		Improper cutting conditions					↘ ●	↘ ●			● Dry									
		Small chip control range										●								
		Improper cutting edge geometry											↗ ●	↗ ●						



TECHNICAL DATA

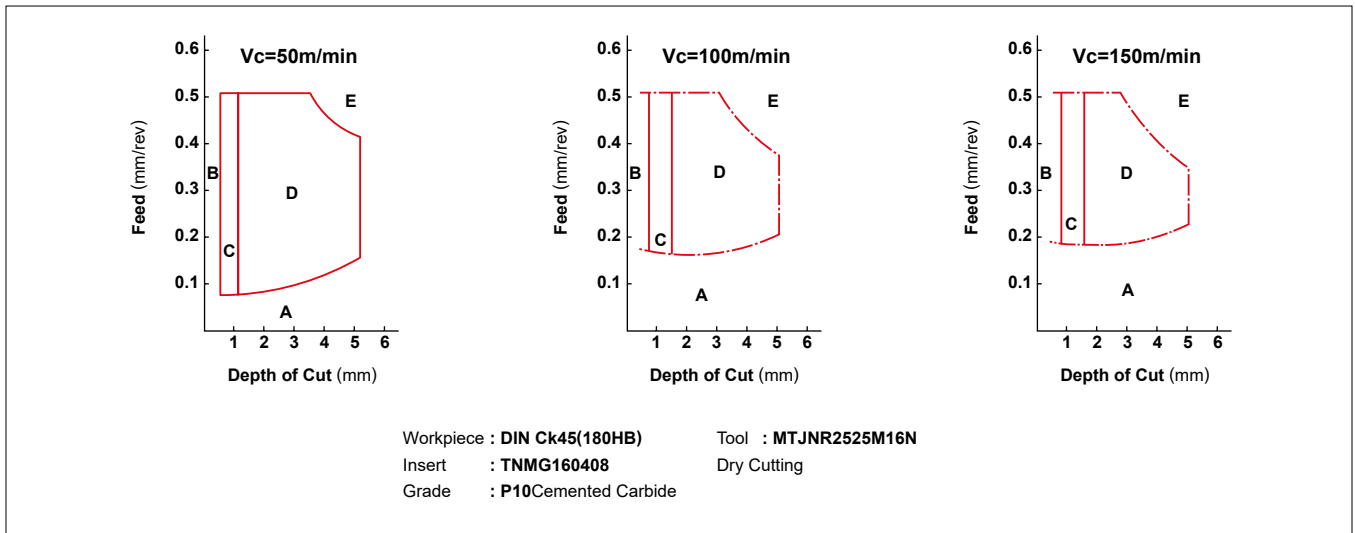
# CHIP CONTROL FOR TURNING

## CHIP BREAKING CONDITIONS IN STEEL TURNING

Type	A Type	B Type	C Type	D Type	E Type
Small Depth of Cut $d < 7\text{mm}$					
Large Depth of Cut $d = 7 - 15\text{mm}$					
Curl Length $l$	No curl	$l \geq 50\text{mm}$	$l \leq 50\text{mm}$ 1-5 Curl	$\cong 1$ Curl	Less Than 1 Curl Half a Curl
Note	<ul style="list-style-type: none"> <li>● Irregular continuous shape</li> <li>● Tangle around tool and workpiece</li> </ul>	<ul style="list-style-type: none"> <li>● Regular continuous shape</li> <li>● Long chips</li> </ul>	Good	Good	<ul style="list-style-type: none"> <li>● Chip scattering</li> <li>● Chattering</li> <li>● Poor finished surface</li> <li>● Maximum</li> </ul>

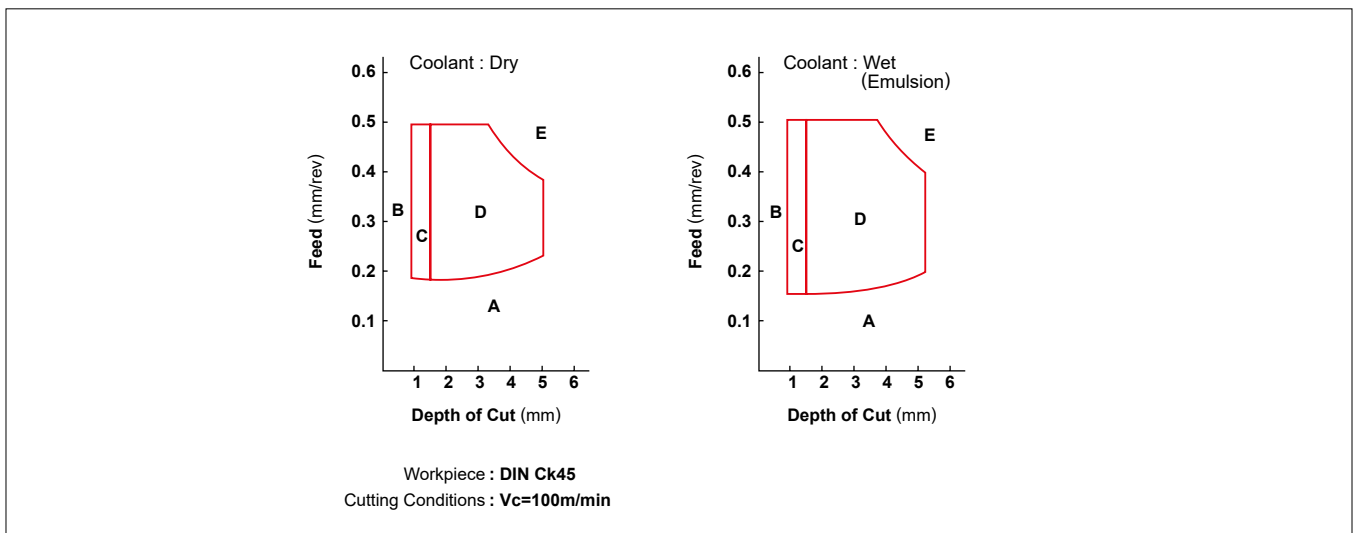
### ● Cutting speed and chip control range of chipbreaker

In general, when cutting speed increases, the chip control range tends to become narrower.



### ● Effects of coolant on the chip control range of a chipbreaker

If the cutting speed is the same, the range of chip control differs according to whether coolant is used or not.



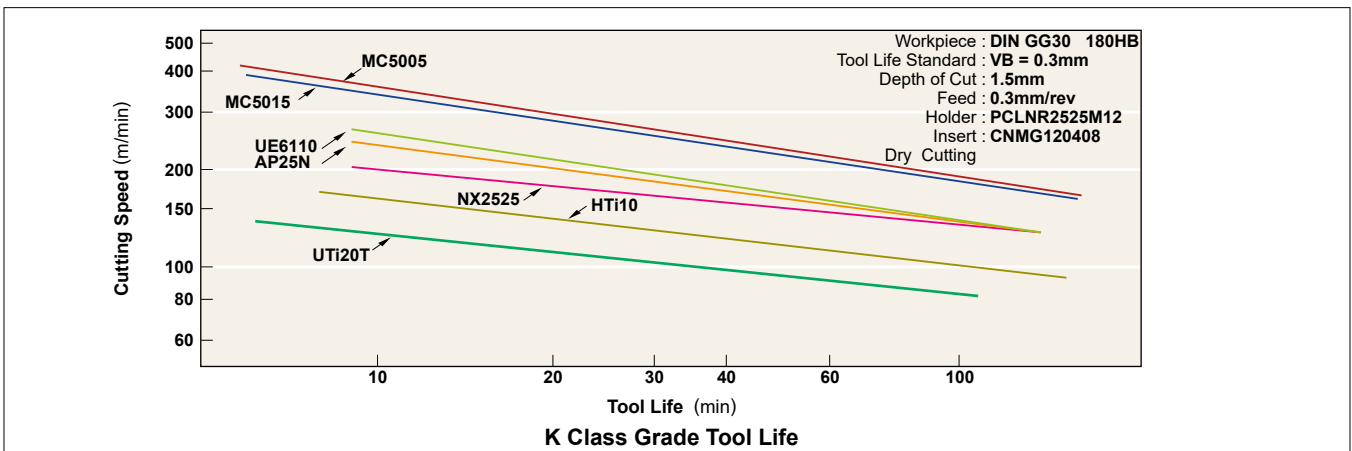
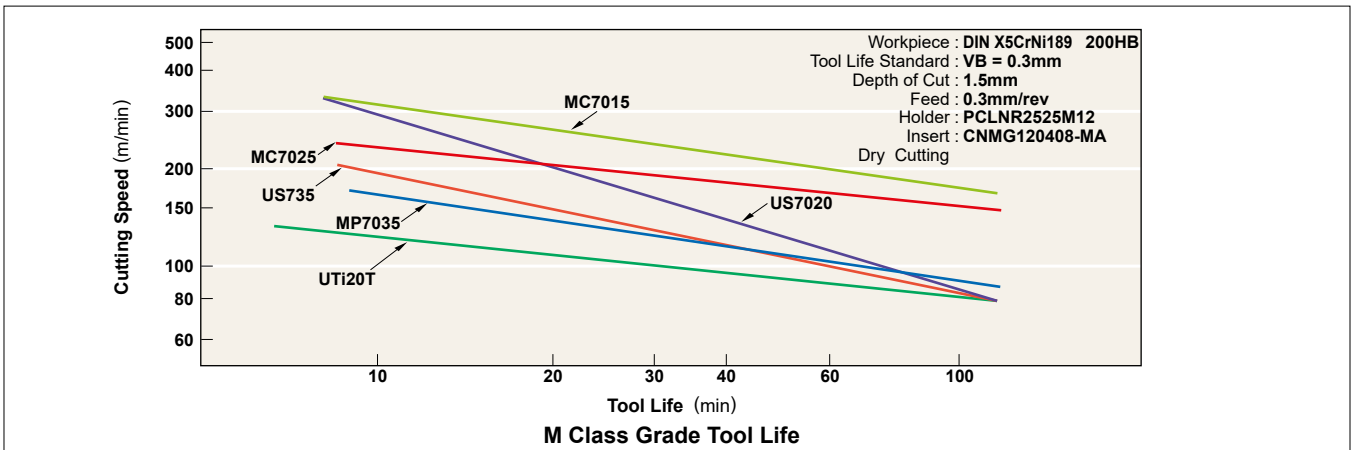
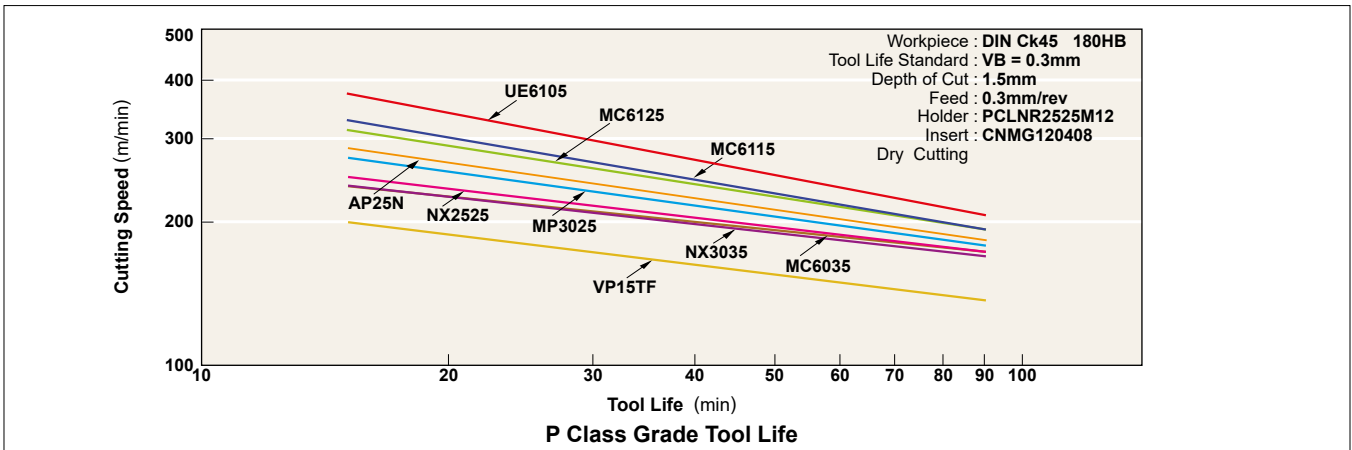
# EFFECTS OF CUTTING CONDITIONS FOR TURNING

## ■ EFFECTS OF CUTTING CONDITIONS

Ideal conditions for cutting are short cutting time, long tool life and high cutting accuracy. In order to obtain these conditions, a selection of efficient cutting conditions and tools, based on work material, hardness, shape and machine capability is necessary.

## ■ CUTTING SPEED

Cutting speed has severe impact on tool life. Increasing cutting speed increases cutting temperature and results in a shortened tool life. Cutting speed varies depending on the type and hardness of the work material. Selecting a tool grade suitable for the cutting speed is necessary.



## ● Effects of Cutting Speed

1. Increasing cutting speed by 20% decreases tool life by 50%. Increasing cutting speed by 50% decreases tool life by 80%.
2. Cutting at low cutting speed (20–40m/min) tends to cause chattering. Thus, tool life is shortened.

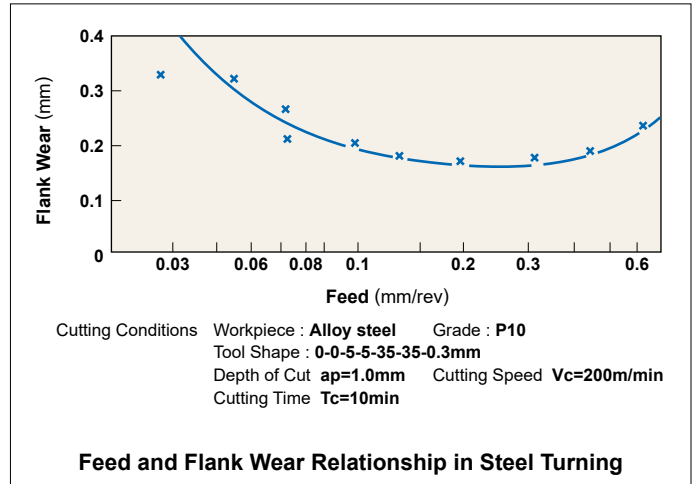
# EFFECTS OF CUTTING CONDITIONS FOR TURNING

## ■ FEED

When cutting with a general holder, feed is the distance a holder moves per workpiece revolution. In milling, feed is the distance a machine table moves per cutter revolution divided by the number of inserts. Thus, it is indicated as feed per tooth. Feed rate relates to finished surface roughness.

### ● Effects of Feed

1. Decreasing feed rate results in flank wear and shortens tool life.
2. Increasing feed rate increases cutting temperature and flank wear. However, effects on the tool life is minimal compared to cutting speed.
3. Increasing feed rate improves machining efficiency.

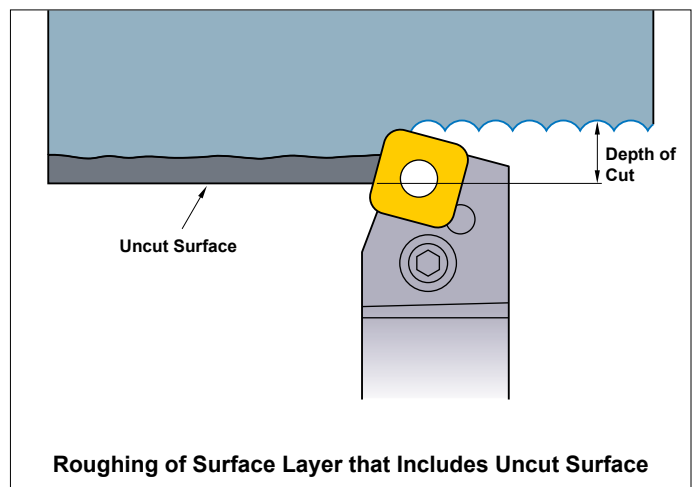
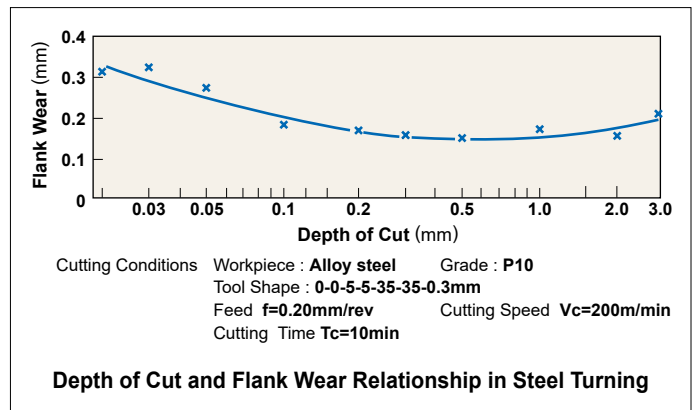


## ■ DEPTH OF CUT

Depth of cut is determined according to the required stock removal, shape of workpiece, power and rigidity of the machine and tool rigidity.

### ● Effects of Depth of Cut

1. Changing depth of cut doesn't effect tool life greatly.
2. Small depths of cut result in friction when cutting the hardened layer of a workpiece. Thus tool life is shortened.
3. When cutting uncut surfaces or cast iron surfaces, the depth of cut needs to be increased as much as the machine power allows in order to avoid cutting the impure hard surface layer with the tip of cutting edge and therefore prevent chipping and abnormal wear.

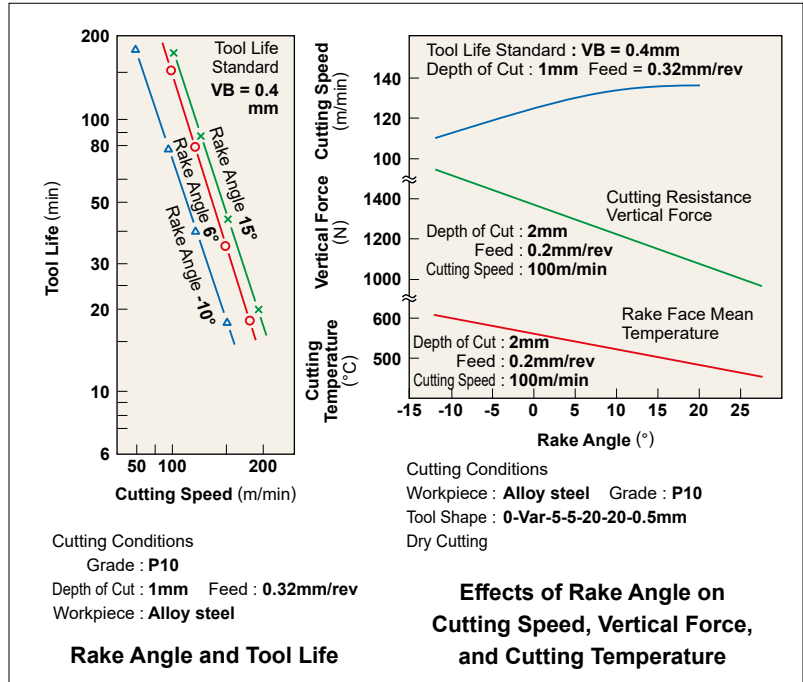
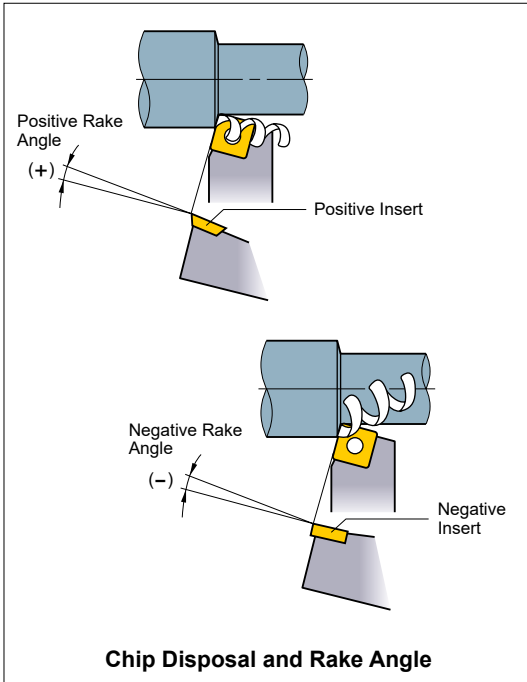




# FUNCTION OF TOOL FEATURES FOR TURNING

## RAKE ANGLE

Rake angle is the cutting edge angle that has a large effect on cutting resistance, chip disposal, cutting temperature and tool life.



### Effects of Rake Angle

1. Increasing rake angle in the positive (+) direction improves sharpness.
2. Increasing rake angle by 1° in the positive (+) direction decreases cutting power by about 1%.
3. Increasing rake angle in the positive (+) direction lowers cutting edge strength and in the negative (-) direction increases cutting resistance.

### When to Increase Rake Angle in the Negative (-) Direction

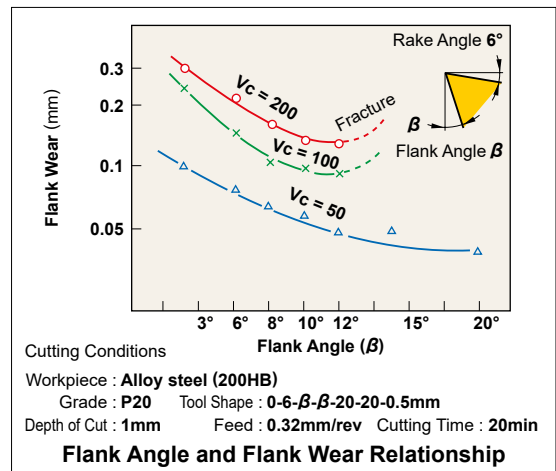
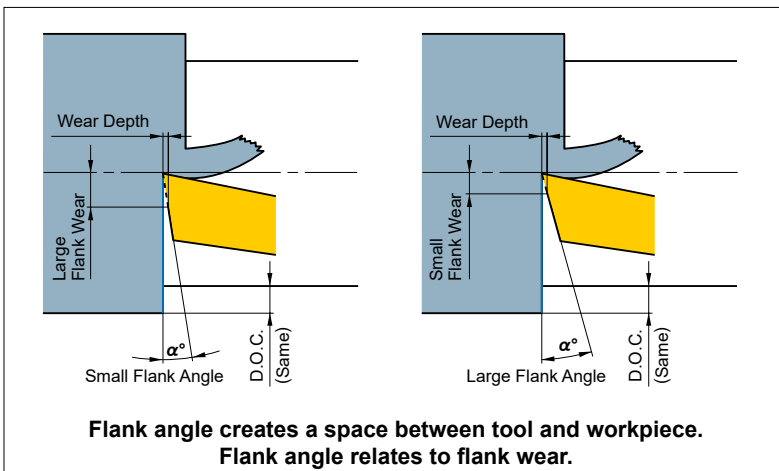
- Hard workpiece.
- When cutting edge strength is required such as in interrupted cutting and uncut surface cutting.

### When to Increase Rake Angle in the Positive (+) Direction

- Soft workpiece.
- Workpiece is easily machined.
- When the workpiece or the machine have poor rigidity.

## FLANK ANGLE

Flank angle prevents friction between the flank face and workpiece resulting in a smooth feed.



### Effects of Flank Angle

1. Increasing flank angle decreases flank wear occurrence.
2. Increasing flank angle lowers cutting edge strength.

### When to Decrease Flank Angle

- Hard workpieces.
- When cutting edge strength is required.

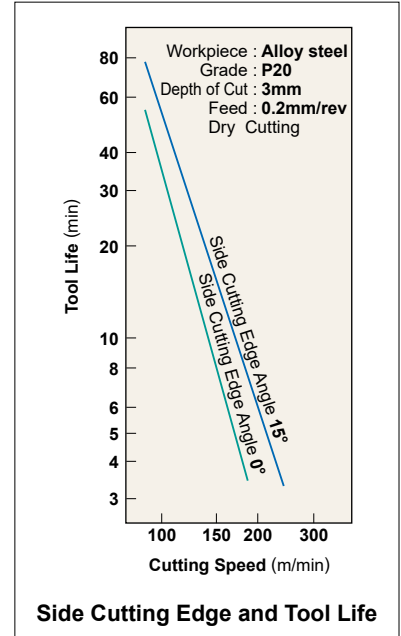
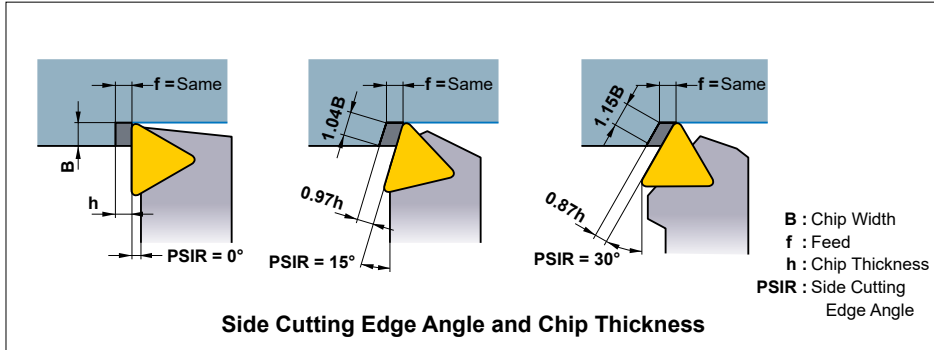
### When to Increase Flank Angle

- Soft workpieces.
- Workpieces suffer easily from work hardening.

# FUNCTION OF TOOL FEATURES FOR TURNING

## ■ SIDE CUTTING EDGE ANGLE (LEAD ANGLE)

Side cutting edge angle and corner angle lower impact load and effect feed force, back force and chip thickness.



### ● Effects of Side Cutting Edge Angle (Lead Angle)

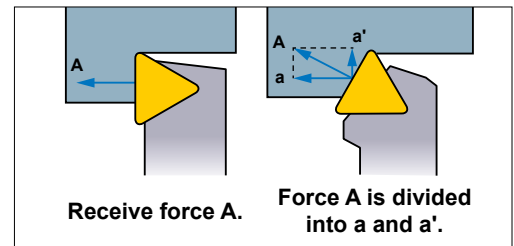
1. At the same feed rate, increasing the side cutting edge angle increases the chip contact length and decreases chip thickness. As a result, the cutting force is dispersed on a longer cutting edge and tool life is prolonged. (Refer to the chart.)
2. Increasing the side cutting edge angle increases force  $a'$ . Thus, thin, long workpieces can suffer from bending.
3. Increasing the side cutting edge angle decreases chip control.
4. Increasing the side cutting edge angle decreases the chip thickness and increases chip width. Thus, breaking the chips is difficult.

**When to Decrease Lead Angle**

- Finishing with a small depth of cut.
- Thin, long workpieces.
- When the machine has poor rigidity.

**When to Increase Lead Angle**

- Hard workpieces which produce high cutting temperature.
- When roughing a large diameter workpiece.
- When the machine has high rigidity.

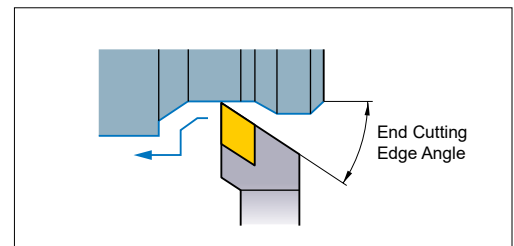


## ■ END CUTTING EDGE ANGLE

The end cutting edge angle avoids interference between the machined surface and the tool (end cutting edge). Usually  $5^\circ - 15^\circ$ .

### ● Effects of End Cutting Edge Angle

1. Decreasing the end cutting edge angle increases cutting edge strength, but it also increases cutting edge temperature.
2. Decreasing the end cutting edge angle increases the back force and can result in chattering and vibration while machining.
3. Small end cutting edge angle for roughing and a large angle when finishing are recommended.

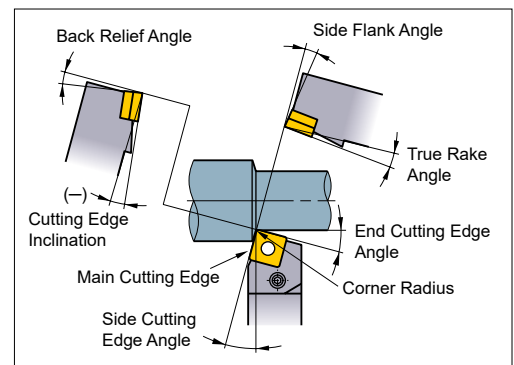


## ■ CUTTING EDGE INCLINATION

Cutting edge inclination indicates inclination of the rake face. When heavy cutting, the cutting edge receives an extremely large shock at the beginning of cutting. Cutting edge inclination keeps the cutting edge from receiving this shock and prevents fracturing.  $3^\circ - 5^\circ$  in turning and  $10^\circ - 15^\circ$  in milling are recommended.

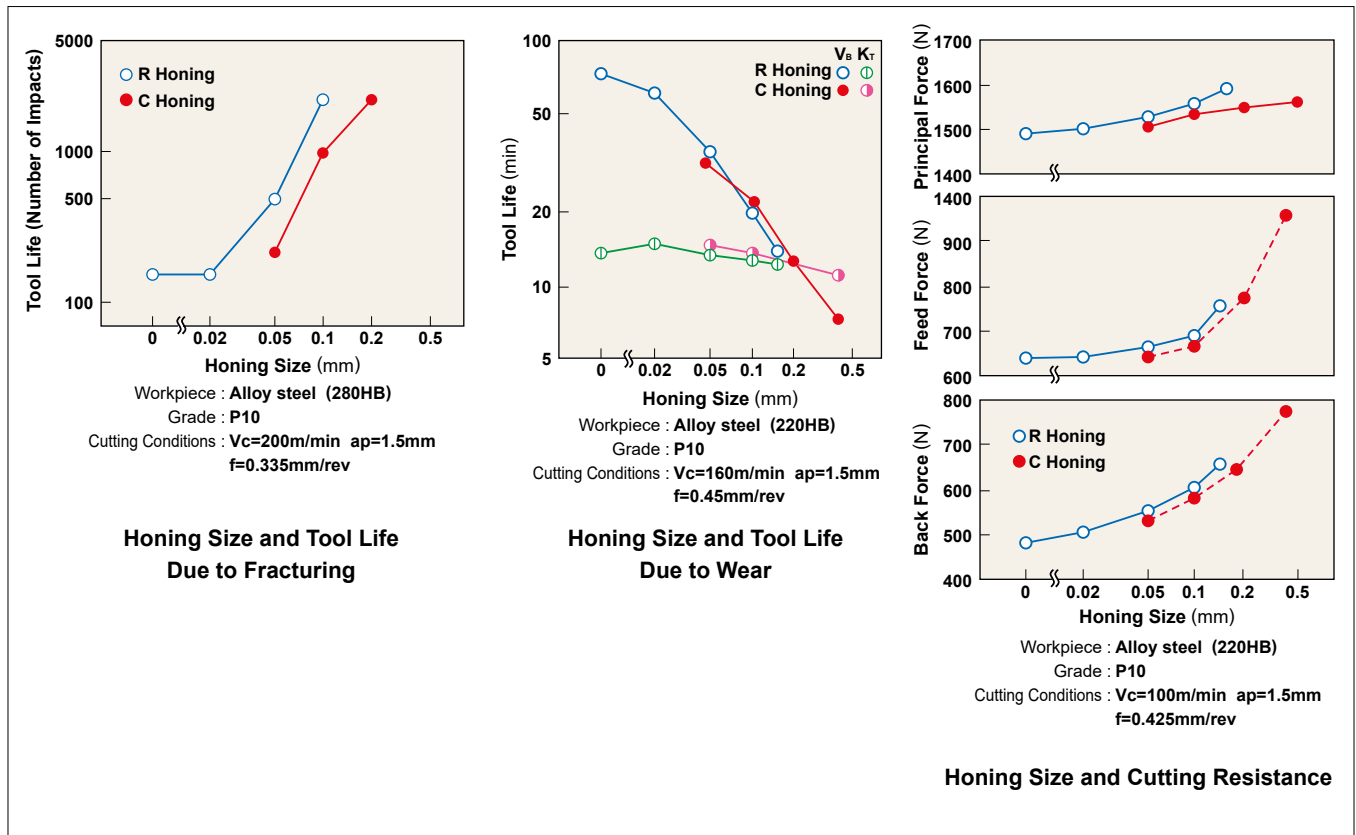
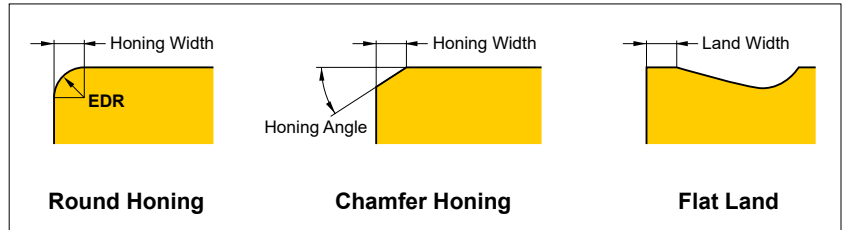
### ● Effects of Cutting Edge Inclination

1. Negative (-) cutting edge inclination disposes chips in the workpiece direction, and positive (+) disposes chips in the opposite direction.
2. Negative (-) cutting edge inclination increases cutting edge strength, but it also increases back force of cutting resistance. Thus, chattering easily occurs.



## ■ HONING AND LAND

Honing and land are cutting edge shapes that maintain cutting edge strength. Honing can be round or chamfer type. The optimal honing width is approximately 1/2 of the feed. Land is the narrow flat area on the rake or flank face.



## ● Effects of Honing

1. Enlarging the honing increases cutting edge strength, tool life and reduces fracturing.
2. Enlarging the honing increases flank wear occurrence and shortens tool life. Honing size doesn't affect rake wear.
3. Enlarging the honing increases cutting resistance and chattering.

### When to Decrease Honing Size

- When finishing with a small depth of cut and small feed.
- Soft workpieces.
- When the workpiece and the machine have poor rigidity.

### When to Increase Honing Size

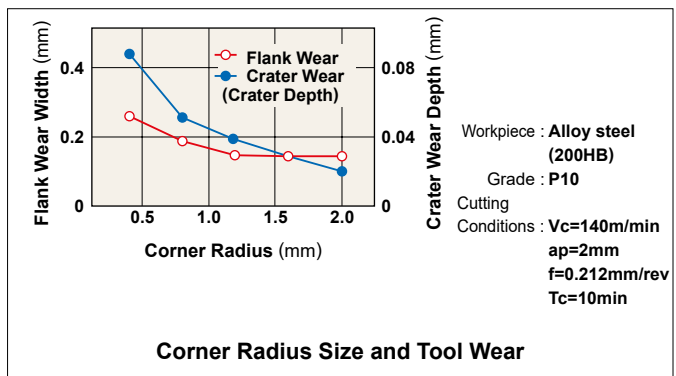
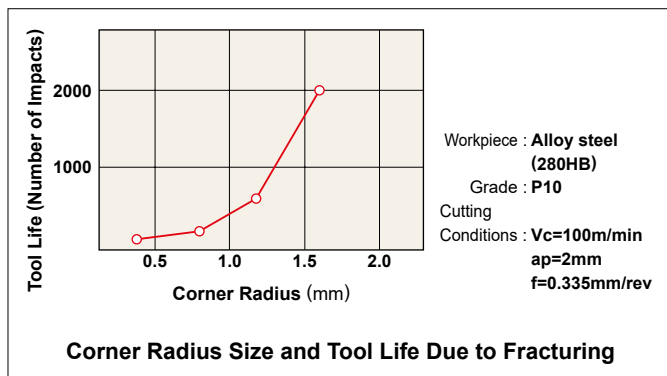
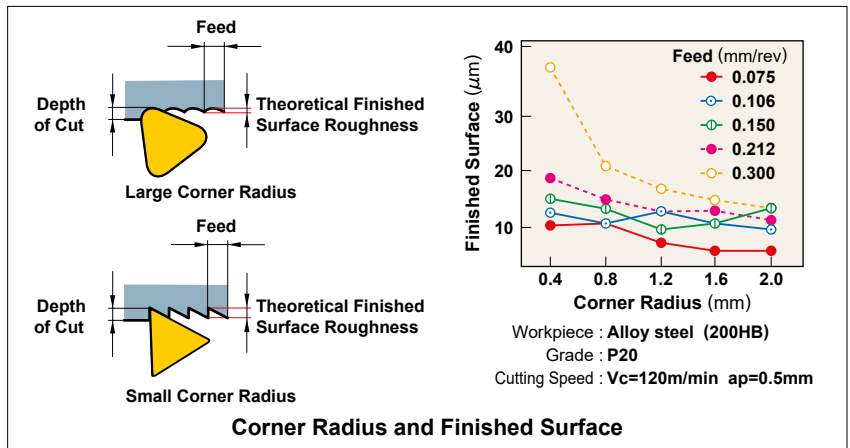
- Hard workpieces.
- When cutting edge strength is required for uncut surfaces and interrupted cutting.
- When the machine has high rigidity.

Note 1) Cemented carbide, UTi, coated diamond and indexable cermet inserts have round honing as standard already.

# FUNCTION OF TOOL FEATURES FOR TURNING

## ■ RADIUS

Radius effects the cutting edge strength and finished surface. In general, a corner radius 2–3 times the feed is recommended.



## ● Effects of Corner Radius

1. Increasing the corner radius improves the surface finish.
2. Increasing the corner radius improves cutting edge strength.
3. Increasing the corner radius too much increases the cutting resistance and causes chattering.
4. Increasing the corner radius decreases flank and rake wear.
5. Increasing the corner radius too much results in poor chip control.

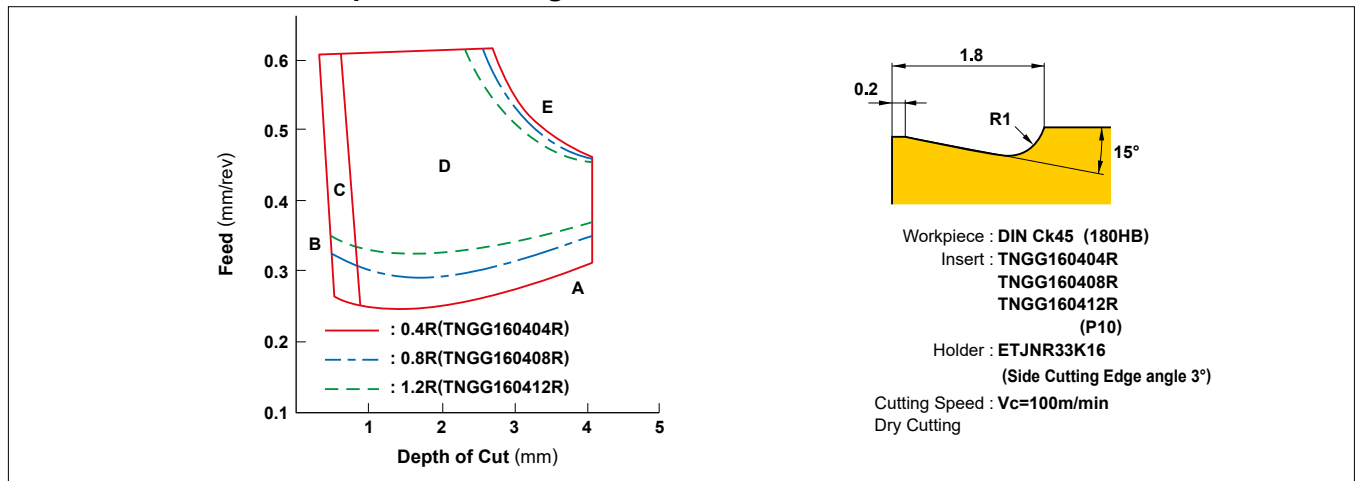
### When to Decrease Corner Radius

- Finishing with small depth of cut.
- Thin, long workpieces.
- When the machine has poor rigidity.

### When to Increase Corner Radius

- When cutting edge strength is required for interrupted cutting and uncut surface cutting.
- When roughing a workpiece with a large diameter.
- When the machine has high rigidity.

## ● Corner Radius and Chip Control Range



Note 1) Please refer to page P008 for chip shapes (A, B, C, D, E).

# FORMULAE FOR CUTTING POWER

## ■ CUTTING POWER (Pc)

$$P_c = \frac{a_p \cdot f \cdot V_c \cdot K_c}{60 \times 10^3 \times \eta} \text{ (kW)}$$

**P<sub>c</sub> (kW)** : Actual Cutting Power  
**f (mm/rev)** : Feed per Revolution  
**K<sub>c</sub> (MPa)** : Specific Cutting Force

**a<sub>p</sub> (mm)** : Depth of Cut  
**V<sub>c</sub> (m/min)** : Cutting Speed  
**η** : (Machine Coefficient)

(Example) What is the cutting power required for machining mild steel at cutting speed 120m/min with depth of cut 3mm and feed 0.2mm/rev (Machine coefficient 80%) ? (Answer) Substitute the specific cutting force K<sub>c</sub>=3100MPa into the formula.

$$P_c = \frac{3 \times 0.2 \times 120 \times 3100}{60 \times 10^3 \times 0.8} = 4.65 \text{ (kW)}$$

### ● K<sub>c</sub>

Work Material	Tensile Strength(MPa) and Hardness	Specific Cutting Force K <sub>c</sub> (MPa)				
		0.1 (mm/rev)	0.2 (mm/rev)	0.3 (mm/rev)	0.4 (mm/rev)	0.6 (mm/rev)
Mild Steel	520	3610	3100	2720	2500	2280
Medium Steel	620	3080	2700	2570	2450	2300
Hard Steel	720	4050	3600	3250	2950	2640
Tool Steel	670	3040	2800	2630	2500	2400
Tool Steel	770	3150	2850	2620	2450	2340
Chrome Manganese Steel	770	3830	3250	2900	2650	2400
Chrome Manganese Steel	630	4510	3900	3240	2900	2630
Chrome Molybdenum Steel	730	4500	3900	3400	3150	2850
Chrome Molybdenum Steel	600	3610	3200	2880	2700	2500
Nickel Chrome Molybdenum Steel	900	3070	2650	2350	2200	1980
Nickel Chrome Molybdenum Steel	352HB	3310	2900	2580	2400	2200
Hard Cast Iron	46HRC	3190	2800	2600	2450	2270
Meehanite Cast Iron	360	2300	1930	1730	1600	1450
Grey Cast Iron	200HB	2110	1800	1600	1400	1330

## ■ CUTTING SPEED (V<sub>c</sub>)

$$V_c = \frac{\pi \cdot D_m \cdot n}{1000} \text{ (m/min)}$$

**V<sub>c</sub> (m/min)** : Cutting Speed  
**D<sub>m</sub> (mm)** : Workpiece Diameter  
**π (3.14)** : Pi  
**n (min<sup>-1</sup>)** : Main Axis Spindle Speed

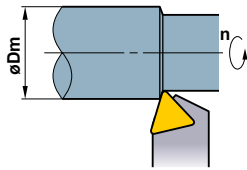
\*Divide by 1000 to change to m from mm.

(Example) What is the cutting speed when main axis spindle speed is 700min<sup>-1</sup> and external diameter is φ50 ?

(Answer) Substitute π=3.14, D<sub>m</sub>=50, n=700 into the formula.

$$V_c = \frac{\pi \cdot D_m \cdot n}{1000} = \frac{3.14 \times 50 \times 700}{1000} = 110 \text{ m/min}$$

Cutting speed is 110m/min.



## ■ FEED (f)

$$f = \frac{l}{n} \text{ (mm/rev)}$$

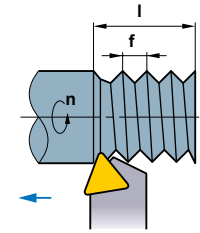
**f (mm/rev)** : Feed per Revolution  
**l (mm/min)** : Cutting Length per Min.  
**n (min<sup>-1</sup>)** : Main Axis Spindle Speed

(Example) What is the feed per revolution when main axis spindle speed is 500min<sup>-1</sup> and cutting length per minute is 120mm/min ?

(Answer) Substitute n=500, l=120 into the formula.

$$f = \frac{l}{n} = \frac{120}{500} = 0.24 \text{ mm/rev}$$

The answer is 0.24mm/rev.



## ■ CUTTING TIME (T<sub>c</sub>)

$$T_c = \frac{l_m}{l} \text{ (min)}$$

**T<sub>c</sub> (min)** : Cutting Time  
**l<sub>m</sub> (mm)** : Workpiece Length  
**l (mm/min)** : Cutting Length per Min.

(Example) What is the cutting time when 100mm workpiece is machined at 1000min<sup>-1</sup> with feed = 0.2mm/rev ?

(Answer) First, calculate the cutting length per min. from the feed and spindle speed.

$$l = f \cdot n = 0.2 \times 1000 = 200 \text{ mm/min}$$

Substitute the answer above into the formula.

$$T_c = \frac{l_m}{l} = \frac{100}{200} = 0.5 \text{ min}$$

0.5 x 60=30 (sec.) The answer is 30 sec.

## ■ THEORETICAL FINISHED SURFACE ROUGHNESS (h)

$$h = \frac{f^2}{8RE} \times 1000 \text{ (}\mu\text{m)}$$

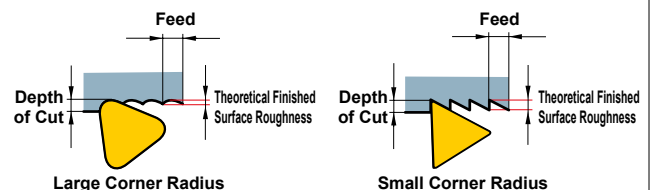
**h (μm)** : Finished Surface Roughness  
**f (mm/rev)** : Feed per Revolution  
**RE (mm)** : Insert Corner Radius

(Example) What is the theoretical finished surface roughness when the insert corner radius is 0.8mm and feed is 0.2mm/rev ?

(Answer) Substitute f=0.2mm/rev, RE=0.8 into the formula.

$$h = \frac{0.2^2}{8 \times 0.8} \times 1000 = 6.25 \mu\text{m}$$

The theoretical finished surface roughness is 6μm.

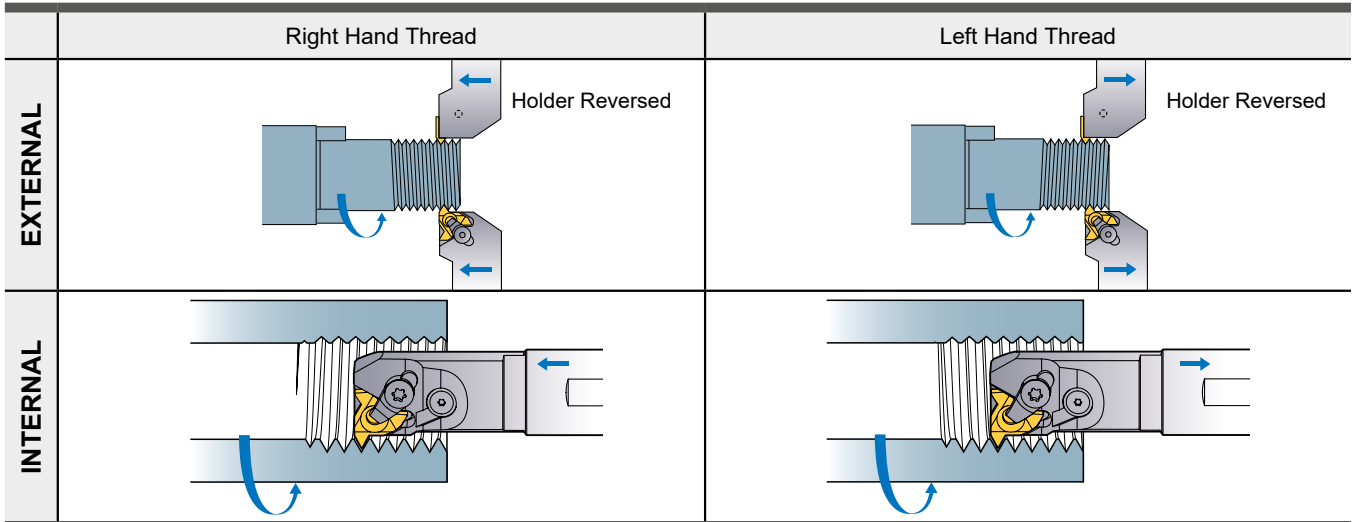


# TROUBLE SHOOTING FOR THREADING

Problems	Observation	Causes	Solutions	
Low thread precision.	Threads do not mesh with each other.	Incorrect tool installation.	Set the insert centre height at 0mm.	
			Check holder inclination (Lateral).	
	Shallow thread.	Incorrect depth of cut.	Modify the depth of cut.	
		Lack of insert wear or plastic deformation resistance.	Refer to "Quickly generated flank wear." and "Large plastic deformation." below.	
Poor surface finish.	Surface damage.	Chips wrap around or clog the work pieces.	Change to flank infeed and control the chip discharge direction. Change to an M-class insert with a 3-D chipbreaker.	
		The side of the insert cutting edge interferes with the workpiece.	Check the lead angle and select an appropriate shim.	
		Surface tears.	Built-up edge (Welding).	Increase cutting speed. Increase coolant pressure and volume.
	Cutting resistance too high.		Decrease depth of cut per pass.	
	Surface vibrations.	Cutting speed too high.	Decrease the cutting speed.	
		Insufficient work piece or tool clamping.	Re-check work piece and tool clamping. (Chuck pressure, clamping allowance)	
		Incorrect tool installation.	Set the insert centre height at 0 mm.	
	Short tool life.	Flank wear quickly generated.	Cutting speed too high.	Decrease the cutting speed.
			Too many passes causes abrasive wear.	Reduce the number of passes.
			Small depth of cut for the finishing pass.	Do not re-cut at 0mm depth of cut, larger than 0.05mm depth of cut is recommended.
Non-uniform wear of the right and left sides of the cutting edge.		The work piece lead angle and the tool lead angle do not match.	Check the work piece lead angle and select an appropriate shim.	
Chipping and fracture.		Cutting speed too low.	Cutting resistance too high.	Increase cutting speed.
				Increase the number of passes and decrease the cutting resistance per pass.
		Unstable clamping.	Chip packing.	Check work piece deflection. Shorten tool overhang. Re-check work piece and tool clamping. (Chuck pressure, clamping allowance)
				Increase coolant pressure to blow away chips. Change the tool pass to control chips. (Lengthen each pass to allow the coolant to clear the chips.) Change from standard internal cutting to back turning to prevent chip jamming.
				Non-chamfered work pieces causes high resistance at the start of each pass.
		Large plastic deformation.	High cutting speed and large heat generation.	Decrease the cutting speed.
			Lack of coolant supply.	Check coolant supply is sufficient. Increase coolant pressure and volume.
Cutting resistance too high.				Increase the number of passes and decrease the cutting resistance per pass.

# THREADING METHODS

## THREADING METHODS



## INSERT TYPES

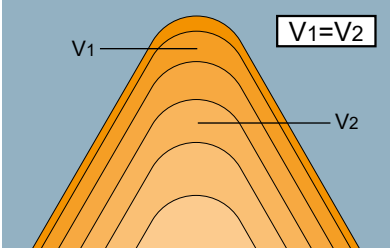
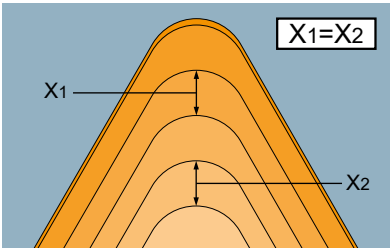
Partial Form	Full Form	Semi-Full Form (Trapezoidal threads only)
<ul style="list-style-type: none"> <li>● The same insert can be used for a range of pitches.</li> <li>● Shorter tool life because the nose radius of the insert is smaller than that of the full form insert.</li> <li>● Finishing with another operation is necessary.</li> </ul>	<ul style="list-style-type: none"> <li>● No deburring needed after threading.</li> <li>● Requires different threading inserts.</li> </ul>	<ul style="list-style-type: none"> <li>● No deburring needed after threading.</li> <li>● Requires different threading inserts.</li> <li>● Finishing with another operation is necessary.</li> </ul>
<p>Crest Radius (Additional turning necessary to finish the thread crest.)</p> <p>Pre-finished Surface</p> <p>Finished Surface</p> <p>Feed Direction</p> <p>Insert</p>	<p>Crest Radius (Wiped/finished surface.)</p> <p>Pre-finished Surface</p> <p>Finished Surface</p> <p>Finishing allowance</p> <p>Feed Direction</p> <p>Insert</p>	<p>Crest Radius (Additional turning necessary to finish the thread crest.)</p> <p>Pre-finished Surface</p> <p>Finished Surface</p> <p>Feed Direction</p> <p>Insert</p>

## INFEEED METHODS

	Radial Infeed	Flank Infeed	Modified Flank Infeed	Incremental Infeed
Features	<p>Radial Infeed</p>	<p>Flank Infeed</p>	<p>Modified Flank Infeed</p>	<p>Incremental Infeed</p>
Advantages	<ul style="list-style-type: none"> <li>● Easiest to use. (Standard programme for threading)</li> <li>● Wide application. (Cutting conditions easy to change.)</li> <li>● Uniform wear of the right and left sides of the cutting edge.</li> </ul>	<ul style="list-style-type: none"> <li>● Relatively easy to use. (Semi-standard programme for threading.)</li> <li>● Reduced cutting force.</li> <li>● Suitable for large pitch threads or materials that peel easily.</li> <li>● Good chip discharge.</li> </ul>	<ul style="list-style-type: none"> <li>● Preventing flank wear on the right side of the cutting edge.</li> <li>● Reduced cutting force.</li> <li>● Suitable for large pitch threads or materials that peel easily.</li> <li>● Good chip discharge.</li> </ul>	<ul style="list-style-type: none"> <li>● Uniform flank wear of the right and left sides of the cutting edge.</li> <li>● Reduced cutting force.</li> <li>● Suitable for large pitch threads or materials that peel easily.</li> </ul>
Disadvantages	<ul style="list-style-type: none"> <li>● Difficult chip control.</li> <li>● Subject to vibration in the later in stages of cutting.</li> <li>● Ineffective for large pitch threading.</li> <li>● Heavy load on the nose radius.</li> </ul>	<ul style="list-style-type: none"> <li>● Large flank wear on the right side of the cutting edge.</li> <li>● Relatively difficult to change cutting depth. (Re-programming necessary)</li> </ul>	<ul style="list-style-type: none"> <li>● Complex machining programming.</li> <li>● Difficult to change cutting depth. (Re-programming necessary)</li> </ul>	<ul style="list-style-type: none"> <li>● Complex machining programming.</li> <li>● Difficult to change cutting depth. (Re-programming necessary)</li> <li>● Difficult chip control.</li> </ul>

# THREADING METHODS

## THREADING DEPTH

		Features	
		Advantages	Disadvantages
 <p>Fixed cut area</p>	<ul style="list-style-type: none"> <li>● Easy to use. (Standard programme for threading.)</li> <li>● Superior resistance to vibration. (Constant cutting force.)</li> </ul>	<ul style="list-style-type: none"> <li>● Long chips generated during the final pass.</li> <li>● Complex calculation of cutting depth when changing the number of passes.</li> </ul>	
 <p>Fixed cutting depth</p>	<ul style="list-style-type: none"> <li>● Reduced load on nose radius during the first half of the passes.</li> <li>● Easy chip control. (Optional setting of chip thickness)</li> <li>● Easy to calculate cutting depth when changing the number of passes.</li> <li>● Good chip control.</li> </ul>	<ul style="list-style-type: none"> <li>● Subject to vibration in the later stages of cutting. (Increased cutting force)</li> <li>● In some cases, changing the NC programme is necessary.</li> </ul>	

Note 1) It is recommended to set the depth of cut of the final pass to 0.05mm–0.025mm. Large cutting depths can cause vibration, leading to a poor surface finish.

## FORMULAE

### ● Formulae to calculate infeed for each pass in a reduced series.

$\Delta ap_n = \frac{ap}{\sqrt{n_{ap}-1}} \times \sqrt{b}$	<p>(Example) External threading (ISO Metric) Pitch : 1.0mm ap : 0.6mm n<sub>ap</sub> : 5 passes</p> <p>1st Pass <math>\Delta ap_1 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{0.3} = 0.16 \rightarrow \mathbf{0.16} (\Delta ap_1)</math></p> <p>2nd Pass <math>\Delta ap_2 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{2-1} = 0.3 \rightarrow \mathbf{0.14} (\Delta ap_2 - \Delta ap_1)</math></p> <p>3rd Pass <math>\Delta ap_3 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{3-1} = 0.42 \rightarrow \mathbf{0.12} (\Delta ap_3 - \Delta ap_2)</math></p> <p>4th Pass <math>\Delta ap_4 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{4-1} = 0.52 \rightarrow \mathbf{0.1} (\Delta ap_4 - \Delta ap_3)</math></p> <p>5th Pass <math>\Delta ap_5 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{5-1} = 0.6 \rightarrow \mathbf{0.08} (\Delta ap_5 - \Delta ap_4)</math></p>
--	--

- $\Delta ap_n$  : Depth of cut
- n : Actual pass
- ap : Total depth of cut
- n<sub>ap</sub> : Number of passes
- b : 1st pass 0.3
- 2nd pass 2-1 = 1
- 3rd pass 3-1 = 2
- 
- 
- nth pass n-1

## NC PROGRAMME FOR MODIFIED FLANK INFEEED

### ● Example: M12×1.0 5 passes modified 5°

External Threading	Internal Threading
G00 Z = 5.0 X = 14.0	G00 Z = 5.0 X = 10.0
G92 U-4.34 Z-13.0 F1.0	G92 U4.34 Z-13.0 F1.0
G00 W-0.07	G00 W-0.07
G92 U-4.64 Z-13.0 F1.0	G92 U4.64 Z-13.0 F1.0
G00 W-0.06	G00 W-0.05
G92 U-4.88 Z-13.0 F1.0	G92 U4.84 Z-13.0 F1.0
G00 W-0.05	G00 W-0.04
G92 U-5.08 Z-13.0 F1.0	G92 U5.02 Z-13.0 F1.0
G00 W-0.03	G00 W-0.03
G92 U-5.20 Z-13.0 F1.0	G92 U5.14 Z-13.0 F1.0
G00	G00



## SELECTING CUTTING CONDITIONS

		Priority					
		Tool Life	Cutting Force	Surface Finish	Precision of Thread	Chips Discharge	Efficiency (Reduced Passes)
Threading Methods	Radial	○		○	○		○
	Flank	(△ : Modified)	○	(△ : Modified)		○	
Cutting Depth	Fixed Cutting Depth					○	
	Fixed Cut Area	○	○	○	○		○

Note 1) Tool life and surface finish accuracy can be increased by changing the threading method from flank infeed to modified flank infeed. Chip control can be improved by increasing the cutting depth in the later half of passes.

## CUTTING DEPTH AND THE NUMBER OF PASSES

### ● Selection of the appropriate cutting depth and the right number of passes is vital for threading.

- For most threading, use a "threading cycle program," which has originally been installed on machines, and specify "total cutting depth" and "cutting depth in the first or final pass."
- Cutting depth and the number of passes are easy to change for the radial infeed method, thus making it easy to determine the appropriate cutting conditions.

## FEATURES AND BENEFITS OF MITSUBISHI PRODUCTS

- Insert grades with high wear and plastic deformation resistance, specially produced for threading tools, ensure highly efficient cutting by enabling high-speed machining and a reduced number of passes.



**Machining Cost Reduction**

## ADVICE ON IMPROVED THREADING

### ● Increasing tool life

- To prevent damage to the nose radius - Recommended method - Modified flank infeed
- To have uniform flank wear on both sides of a cutting edge - Recommended method - Radial infeed
- To prevent crater wear - Recommended method - Flank infeed

### ● Preventing chip problems

- Change to flank or modified infeed.
- During radial infeed cutting, use an inverted holder and change the coolant supply to a downward direction.
- When using the radial infeed method, set the minimum cutting depth at around 0.2mm to make the chips thicker.

### ● To achieve highly efficient machining

- Increase cutting speed. (Dependant on the maximum revolution and rigidity of the machine.)
- Reduce the number of passes. (Reduce by 30-40%.)
- A reduced number of passes can improve chip discharge because of the thicker chips generated.

### ● Preventing vibration

- Change to flank or modified infeed.
- When using radial infeed, reduce cutting depth in the later half of passes and lower the cutting speed.

### ● Increased surface finish accuracy

- A final wiping pass should be performed at the same depth of cut as the last regular pass.
- When using the flank infeed method, change to radial infeed only during the final pass.

# TECHNICAL DATA

## METALLIC MATERIALS CROSS REFERENCE LIST

### ■ CARBON STEEL

Germany		U.K.		France	Italy	Spain	Sweden	Japan	USA	China
W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	JIS	AISI/SAE	GB
1.0038	RSt.37-2	4360 40 C	–	E 24-2 Ne	–	–	1311	STKM 12A STKM 12C	A570.36	15
1.0401	C15	080M15	–	CC12	C15, C16	F.111	1350	–	1015	15
1.0402	C22	050A20	2C	CC20	C20, C21	F.112	1450	–	1020	20
1.0715	9SMn28	230M07	1A	S250	CF9SMn28	F.2111 11SMn28	1912	SUM22	1213	Y15
1.0718	9SMnPb28	–	–	S250Pb	CF9SMnPb28	11SMnPb28	1914	SUM22L	12L13	–
1.0722	10SPb20	–	–	10PbF2	CF10Pb20	10SPb20	–	–	–	–
1.0736	9SMn36	240M07	1B	S300	CF9SMn36	12SMn35	–	–	1215	Y13
1.0737	9SMnPb36	–	–	S300Pb	CF9SMnPb36	12SMnP35	1926	–	12L14	–
1.1141	Ck15	080M15	32C	XC12	C16	C15K	1370	S15C	1015	15
1.1158	Ck25	–	–	–	–	–	–	S25C	1025	25
1.8900	StE380	4360 55 E	–	–	FeE390KG	–	2145	–	A572-60	–
1.0501	C35	060A35	–	CC35	C35	F.113	1550	–	1035	35
1.0503	C45	080M46	–	CC45	C45	F.114	1650	–	1045	45
1.0726	35S20	212M36	8M	35MF4	–	F210G	1957	–	1140	–
1.1157	40Mn4	150M36	15	35M5	–	–	–	–	1039	40Mn
1.1167	36Mn5	–	–	40M5	–	36Mn5	2120	SMn438(H)	1335	35Mn2
1.1170	28Mn6	150M28	14A	20M5	C28Mn	–	–	SCMn1	1330	30Mn
1.1183	Cf35	060A35	–	XC38TS	C36	–	1572	S35C	1035	35Mn
1.1191	Ck45	080M46	–	XC42	C45	C45K	1672	S45C	1045	Ck45
1.1213	Cf53	060A52	–	XC48TS	C53	–	1674	S50C	1050	50
1.0535	C55	070M55	9	–	C55	–	1655	–	1055	55
1.0601	C60	080A62	43D	CC55	C60	–	–	–	1060	60
1.1203	Ck55	070M55	–	XC55	C50	C55K	–	S55C	1055	55
1.1221	Ck60	080A62	43D	XC60	C60	–	1678	S58C	1060	60Mn
1.1274	Ck101	060A96	–	XC100	–	F.5117	1870	–	1095	–
1.1545	C105W1	BW1A	–	Y105	C36KU	F.5118	1880	SK3	W1	–
1.1545	C105W1	BW2	–	Y120	C120KU	F.515	2900	SUP4	W210	–

### ■ ALLOY STEEL

Germany		U.K.		France	Italy	Spain	Sweden	Japan	USA	China
W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	JIS	AISI/SAE	GB
1.0144	St.44.2	4360 43 C	–	E28-3	–	–	1412	SM400A, SM400B SM400C	A573-81	–
1.0570	St52-3	4360 50 B	–	E36-3	Fe52BFN Fe52CFN	–	2132	SM490A, SM490B SM490C	–	–
1.0841	St52-3	150M19	–	20MC5	Fe52	F.431	2172	–	5120	–
1.0904	55Si7	250A53	45	55S7	55Si8	56Si7	2085	–	9255	55Si2Mn
1.0961	60SiCr7	–	–	60SC7	60SiCr8	60SiCr8	–	–	9262	–
1.3505	100Cr6	534A99	31	100C6	100Cr6	F.131	2258	SUJ2	ASTM 52100	Gr15, 45G
1.5415	15Mo3	1501-240	–	15D3	16Mo3KW	16Mo3	2912	–	ASTM A204Gr.A	–
1.5423	16Mo5	1503-245-420	–	–	16Mo5	16Mo5	–	–	4520	–
1.5622	14Ni6	–	–	16N6	14Ni6	15Ni6	–	–	ASTM A350LF5	–
1.5662	X8Ni9	1501-509-510	–	–	X10Ni9	XBNI09	–	–	ASTM A353	–
1.5710	36NiCr6	640A35	111A	35NC6	–	–	–	SNC236	3135	–
1.5732	14NiCr10	–	–	14NC11	16NiCr11	15NiCr11	–	SNC415(H)	3415	–
1.5752	14NiCr14	655M13	36A	12NC15	–	–	–	SNC815(H)	3415, 3310	–
1.6523	21NiCrMo2	805M20	362	20NCD2	20NiCrMo2	20NiCrMo2	2506	SNCM220(H)	8620	–
1.6546	40NiCrMo22	311-Type 7	–	–	40NiCrMo2(KB)	40NiCrMo2	–	SNCM240	8740	–
1.6587	17CrNiMo6	820A16	–	18NCD6	–	14NiCrMo13	–	–	–	–
1.7015	15Cr3	523M15	–	12C3	–	–	–	SCr415(H)	5015	15Cr

Germany		U.K.		France	Italy	Spain	Sweden	Japan	USA	China
W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	JIS	AISI/SAE	GB
1.7045	42Cr4	–	–	–	–	42Cr4	2245	SCr440	5140	40Cr
1.7176	55Cr3	527A60	48	55C3	–	–	–	SUP9(A)	5155	20CrMn
1.7262	15CrMo5	–	–	12CD4	–	12CrMo4	2216	SCM415(H)	–	–
1.7335	13CrMo4 4	1501-620Gr27	–	15CD3.5 15CD4.5	14CrMo45	14CrMo45	–	–	ASTM A182 F11, F12	–
1.7380	10CrMo910	1501-622 Gr31, 45	–	12CD9 12CD10	12CrMo9 12CrMo10	TU.H	2218	–	ASTM A182 F.22	–
1.7715	14MoV63	1503-660-440	–	–	–	13MoCrV6	–	–	–	–
1.8523	39CrMoV13 9	897M39	40C	–	36CrMoV12	–	–	–	–	–
1.6511	36CrNiMo4	816M40	110	40NCD3	38NiCrMo4(KB)	35NiCrMo4	–	–	9840	–
1.6582	34CrNiMo6	817M40	24	35NCD6	35NiCrMo6(KB)	–	2541	–	4340	40CrNiMoA
1.7033	34Cr4	530A32	18B	32C4	34Cr4(KB)	35Cr4	–	SCr430(H)	5132	35Cr
1.7035	41Cr4	530M40	18	42C4	41Cr4	42Cr4	–	SCr440(H)	5140	40Cr
1.7131	16MnCr5	(527M20)	–	16MC5	16MnCr5	16MnCr5	2511	–	5115	18CrMn
1.7218	25CrMo4	1717CDS110 708M20	–	25CD4	25CrMo4(KB)	55Cr3	2225	SCM420 SCM430	4130	30CrMn
1.7220	34CrMo4	708A37	19B	35CD4	35CrMo4	34CrMo4	2234	SCM432 SCCRM3	4137 4135	35CrMo
1.7223	41CrMo4	708M40	19A	42CD4TS	41CrMo4	42CrMo4	2244	SCM 440	4140 4142	40CrMoA
1.7225	42CrMo4	708M40	19A	42CD4	42CrMo4	42CrMo4	2244	SCM440(H)	4140	42CrMo 42CrMnMo
1.7361	32CrMo12	722M24	40B	30CD12	32CrMo12	F.124.A	2240	–	–	–
1.8159	50CrV4	735A50	47	50CV4	50CrV4	51CrV4	2230	SUP10	6150	50CrVA
1.8509	41CrAlMo7	905M39	41B	40CAD6 40CAD2	41CrAlMo7	41CrAlMo7	2940	–	–	–
1.2067	100Cr6	BL3	–	Y100C6	–	100Cr6	–	–	L3	CrV, 9SiCr
1.2419	105WCr6	–	–	105WC13	100WCr6 107WCr5KU	105WCr5	2140	SKS31 SKS2, SKS3	–	CrWMo
1.2713	55NiCrMoV6	BH224/5	–	55NCDV7	–	F.520.S	–	SKT4	L6	5CrNiMo
1.5662	X8Ni9	1501-509	–	–	X10Ni9	XBNI09	–	–	ASTM A353	–
1.5680	12Ni19	–	–	Z18N5	–	–	–	–	2515	–
1.6657	14NiCrMo134	832M13	36C	–	15NiCrMo13	14NiCrMo131	–	–	–	–
1.2080	X210Cr12	BD3	–	Z200C12	X210Cr13KU X250Cr12KU	X210Cr12	–	SKD1	D3 ASTM D3	Cr12
1.2601	X153CrMoV12	BD2	–	–	X160CrMoV12	–	–	SKD11	D2	Cr12MoV
1.2363	X100CrMoV5	BA2	–	Z100CDV5	X100CrMoV5	F.5227	2260	SKD12	A2	Cr5Mo1V
1.2344	X40CrMoV51 X40CrMoV51	BH13	–	Z40CDV5	X35CrMoV05KU X40CrMoV51KU	X40CrMoV5	2242	SKD61	H13 ASTM H13	40CrMoV5
1.2436	X210CrW12	–	–	–	X215CrW121KU	X210CrW12	2312	SKD2	–	–
1.2542	45WCrV7	BS1	–	–	45WCrV8KU	45WCrSi8	2710	–	S1	–
1.2581	X30WCrV93	BH21	–	Z30WCV9	X28W09KU	X30WCrV9	–	SKD5	H21	30WCrV9
1.2601	X165CrMoV12	–	–	–	X165CrMoV12KU	X160CrMoV12	2310	–	–	–
1.2833	100V1	BW2	–	Y1105V	–	–	–	SKS43	W210	V
1.3255	S 18-1-2-5	BT4	–	Z80WKCV	X78WCo1805KU	HS18-1-1-5	–	SKH3	T4	W18Cr4VCo5
1.3355	S 18-0-1	BT1	–	Z80WCV	X75W18KU	HS18-0-1	–	SKH2	T1	–
1.3401	G-X120Mn12	Z120M12	–	Z120M12	XG120Mn12	X120MN12	–	SCMnH/1	–	–
1.4718	X45CrSi93	401S45	52	Z45CS9	X45CrSi8	F.322	–	SUH1	HW3	X45CrSi93
1.3343	S6-5-2	4959BA2	–	Z40CSD10	15NiCrMo13	–	2715	SUH3	D3	–
1.3343	S6/5/2	BM2	–	Z85WDCV	HS6-5-2-2	F.5603	2722	SKH9, SKH51	M2	–
1.3348	S 2-9-2	–	–	–	HS2-9-2	HS2-9-2	2782	–	M7	–
1.3243	S6/5/2/5	BM35	–	6-5-2-5	HS6-5-2-5	F.5613	2723	SKH55	M35	–

# TECHNICAL DATA

## METALLIC MATERIALS CROSS REFERENCE LIST

### ■ STAINLESS STEEL (FERRITIC, MARTENSITIC)

Germany		U.K.		France	Italy	Spain	Sweden	Japan	USA	China
W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	JIS	AISI/SAE	GB
1.4000	X7Cr13	403S17	–	Z6C13	X6Cr13	F.3110	2301	SUS403	403	OCr13 1Cr12
1.4001	X7Cr14	–	–	–	–	F.8401	–	–	–	–
1.4005	X12CrS13	416S21	–	Z11CF13	X12CrS13	F.3411	2380	SUS416	416	–
1.4006	X10Cr13	410S21	56A	Z10C14	X12Cr13	F.3401	2302	SUS410	410	1Cr13
1.4016	X8Cr17	430S15	60	Z8C17	X8Cr17	F.3113	2320	SUS430	430	1Cr17
1.4027	G-X20Cr14	420C29	56B	Z20C13M	–	–	–	SCS2	–	–
1.4034	X46Cr13	420S45	56D	Z40CM Z38C13M	X40Cr14	F.3405	2304	SUS420J2	–	4Cr13
1.4003	–	405S17	–	Z8CA12	X6CrAl13	–	–	–	405	–
1.4021	–	420S37	–	Z8CA12	X20Cr13	–	2303	–	420	–
1.4057	X22CrNi17	431S29	57	Z15CNi6.02	X16CrNi16	F.3427	2321	SUS431	431	1Cr17Ni2
1.4104	X12CrMoS17	–	–	Z10CF17	X10CrS17	F.3117	2383	SUS430F	430F	Y1Cr17
1.4113	X6CrMo17	434S17	–	Z8CD17.01	X8CrMo17	–	2325	SUS434	434	1Cr17Mo
1.4313	X5CrNi134	425C11	–	Z4CND13.4M	(G)X6CrNi304	–	2385	SCS5	CA6-NM	–
1.4724	X10CrA113	403S17	–	Z10C13	X10CrA112	F.311	–	SUS405	405	OCr13Al
1.4742	X10CrA118	430S15	60	Z10CAS18	X8Cr17	F.3113	–	SUS430	430	Cr17
1.4747	X80CrNiSi20	443S65	59	Z80CSN20.02	X80CrSiNi20	F.320B	–	SUH4	HNV6	–
1.4762	X10CrA124	–	–	Z10CAS24	X16Cr26	–	2322	SUH446	446	2Cr25N
1.4871	X53CrMnNiN219	349S54	–	Z52CMN21.09	X53CrMnNiN219	–	–	SUH35	EV8	5Cr2Mn9Ni4N
1.4521	X1CrMoTi182	–	–	–	–	–	2326	–	S44400	–
1.4922	X20CrMoV12-1	–	–	–	X20CrMoNi1201	–	2317	–	–	–
1.4542	–	–	–	Z7CNU17-04	–	–	–	–	630	–

### ■ STAINLESS STEEL (AUSTENITIC)

Germany		U.K.		France	Italy	Spain	Sweden	Japan	USA	China
W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	JIS	AISI/SAE	GB
1.4306	X2CrNi1911	304S11	–	Z2CN18.10	X2CrNi18.11	–	2352	SUS304L	304L	OCr19Ni10
1.4350	X5CrNi189	304S11	58E	Z6CN18.09	X5CrNi1810	F.3551 F.3541 F.3504	2332	SUS304	304	OCr18Ni9
1.4305	X12CrNiS188	303S21	58M	Z10CNF18.09	X10CrNiS18.09	F.3508	2346	SUS303	303	1Cr18Ni9MoZr
–	–	304C12	–	Z3CN19.10	–	–	2333	SUS304L	–	–
1.4306	X2CrNi189	304S12	–	Z2CrNi1810	X2CrNi18.11	F.3503	2352	SCS19	304L	–
1.4310	X12CrNi177	–	–	Z12CN17.07	X12CrNi1707	F.3517	2331	SUS301	301	Cr17Ni7
1.4311	X2CrNiN1810	304S62	–	Z2CN18.10	–	–	2371	SUS304LN	304LN	–
1.4401	X5CrNiMo1810	316S16	58J	Z6CND17.11	X5CrNiMo1712	F.3543	2347	SUS316	316	OCr17Ni11Mo2
1.4308	G-X6CrNi189	304C15	–	Z6CN18.10M	–	–	–	SCS13	–	–
1.4408	G-X6CrNiMo1810	316C16	–	–	–	F.8414	–	SCS14	–	–
1.4581	G-X5CrNiMoNb1810	318C17	–	Z4CNDNb1812M	XG8CrNiMo1811	–	–	SCS22	–	–
1.4429	X2CrNiMoN1813	–	–	Z2CND17.13	–	–	2375	SUS316LN	316LN	OCr17Ni13Mo
1.4404	–	316S13	–	Z2CND17.12	X2CrNiMo1712	–	2348	–	316L	–
1.4435	X2CrNiMo1812	316S13	–	Z2CND17.12	X2CrNiMo1712	–	2353	SCS16 SUS316L	316L	OCr27Ni12Mo3
1.4436	–	316S13	–	Z6CND18-12-03	X8CrNiMo1713	–	2343, 2347	–	316	–
1.4438	X2CrNiMo1816	317S12	–	Z2CND19.15	X2CrNiMo1816	–	2367	SUS317L	317L	OCr19Ni13Mo
1.4539	X1NiCrMo	–	–	Z6CNT18.10	–	–	2562	–	UNS V 0890A	–
1.4541	X10CrNiTi189	321S12	58B	Z6CNT18.10	X6CrNiTi1811	F.3553 F.3523	2337	SUS321	321	1Cr18Ni9Ti
1.4550	X10CrNiNb189	347S17	58F	Z6CNNb18.10	X6CrNiNb1811	F.3552 F.3524	2338	SUS347	347	1Cr18Ni11Nb
1.4571	X10CrNiMoTi1810	320S17	58J	Z6CNDT17.12	X6CrNiMoTi1712	F.3535	2350	–	316Ti	Cr18Ni12Mo2T
1.4583	X10CrNiMoNb1812	–	–	Z6CNDNb1713B	X6CrNiMoNb1713	–	–	–	318	Cr17Ni12Mo3Mb

Germany		U.K.		France	Italy	Spain	Sweden	Japan	USA	China
W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	JIS	AISI/SAE	GB
1.4828	X15CrNiSi2012	309S24	–	Z15CNS20.12	X6CrNi2520	–	–	SUH309	309	1Cr23Ni13
1.4845	X12CrNi2521	310S24	–	Z12CN2520	X6CrNi2520	F.331	2361	SUH310	310S	OCr25Ni20
1.4406	X10CrNi18.08	–	58C	Z1NCDU25.20	–	F.8414	2370	SCS17	308	–
1.4418	X4CrNiMo165	–	–	Z6CND16-04-01	–	–	–	–	–	–
1.4568	–	316S111	–	Z8CNA17-07	X2CrNiMo1712	–	–	–	17-7PH	–
1.4504	–	–	–	–	–	–	–	–	–	–
1.4563	–	–	–	Z1NCDU31-27-03 Z1CNDU20-18-06AZ	–	–	2584 2378	–	NO8028 S31254	–
1.4878	X12CrNiTi189	321S32	58B, 58C	Z6CNT18.12B	X6CrNiTi18.11	F.3523	–	SUS321	321	1Cr18Ni9Ti

## HEAT RESISTANT STEELS

Germany		U.K.		France	Italy	Spain	Sweden	Japan	USA	China
W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	JIS	AISI/SAE	GB
1.4864	X12NiCrSi3616	–	–	Z12NCS35.16	–	–	–	SUH330	330	–
1.4865	G-X40NiCrSi3818	330C11	–	–	XG50NiCr3919	–	–	SCH15	HT, HT 50	–

## GRAY CAST IRON

Germany		U.K.		France	Italy	Spain	Sweden	Japan	USA	China
W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	JIS	AISI/SAE	GB
–	–	–	–	–	–	–	0100	–	–	–
–	GG 10	–	–	Ft 10 D	–	–	0110	FC100	No 20 B	–
0.6015	GG 15	Grade 150	–	Ft 15 D	G15	FG15	0115	FC150	No 25 B	HT150
0.6020	GG 20	Grade 220	–	Ft 20 D	G20	–	0120	FC200	No 30 B	HT200
0.6025	GG 25	Grade 260	–	Ft 25 D	G25	FG25	0125	FC250	No 35 B	HT250
–	–	–	–	–	–	–	–	–	No 40 B	–
0.6030	GG 30	Grade 300	–	Ft 30 D	G30	FG30	0130	FC300	No 45 B	HT300
0.6035	GG 35	Grade 350	–	Ft 35 D	G35	FG35	0135	FC350	No 50 B	HT350
0.6040	GG 40	Grade 400	–	Ft 40 D	–	–	0140	–	No 55 B	HT400
0.6660	GGL NiCr202	L-NiCuCr202	–	L-NC 202	–	–	0523	–	A436 Type 2	–

## DUCTILE CAST IRON

Germany		U.K.		France	Italy	Spain	Sweden	Japan	USA	China
W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	JIS	AISI/SAE	GB
0.7040	GGG 40	SNG 420/12	–	FCS 400-12	GS 370-17	FGE 38-17	07 17-02	FCD400	60-40-18	QT400-18
–	GGG 40.3	SNG 370/17	–	FGS 370-17	–	–	07 17-12	–	–	–
0.7033	GGG 35.3	–	–	–	–	–	07 17-15	–	–	–
0.7050	GGG 50	SNG 500/7	–	FGS 500-7	GS 500	FGE 50-7	07 27-02	FCD500	80-55-06	QT500-7
0.7660	GGG NiCr202	Grade S6	–	S-NC202	–	–	07 76	–	A43D2	–
–	GGG NiMn137	L-NiMn 137	–	L-MN 137	–	–	07 72	–	–	–
–	GGG 60	SNG 600/3	–	FGS 600-3	–	–	07 32-03	FCD600	–	QT600-3
0.7070	GGG 70	SNG 700/2	–	FGS 700-2	GS 700-2	FGS 70-2	07 37-01	FCD700	100-70-03	QT700-18

## MALLEABLE CAST IRON

Germany		U.K.		France	Italy	Spain	Sweden	Japan	USA	China
W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	JIS	AISI/SAE	GB
–	–	8 290/6	–	MN 32-8	–	–	08 14	FCMB310	–	–
–	GTS-35	B 340/12	–	MN 35-10	–	–	08 15	FCMW330	32510	–
0.8145	GTS-45	P 440/7	–	Mn 450	GMN45	–	08 52	FCMW370	40010	–
0.8155	GTS-55	P 510/4	–	MP 50-5	GMN55	–	08 54	FCMP490	50005	–
–	GTS-65	P 570/3	–	MP 60-3	–	–	08 58	FCMP540	70003	–
0.8165	GTS-65-02	P 570/3	–	Mn 650-3	GMN 65	–	08 56	FCMP590	A220-70003	–
–	GTS-70-02	P 690/2	–	Mn 700-2	GMN 70	–	08 62	FCMP690	A220-80002	–

# SURFACE ROUGHNESS

## SURFACE ROUGHNESS

(From JIS B 0601-1994)

Type	Code	Determination	Determination Example (Figure)
Arithmetical Mean Roughness	Ra	<p>Ra means the value obtained by the following formula and expressed in micrometer (<math>\mu\text{m}</math>) when sampling only the reference length from the roughness curve in the direction of the mean line, taking X-axis in the direction of mean line and Y-axis in the direction of longitudinal magnification of this sampled part and the roughness curve is expressed by <math>y=f(x)</math>:</p> $Ra = \frac{1}{l} \int_0^l  f(x)  dx$	
Maximum Height	Rz	<p>Rz shall be that only when the reference length is sampled from the roughness curve in the direction of the mean line, the distance between the top profile peak line and the bottom profile valley line on this sampled portion is measured in the longitudinal magnification direction of roughness curve and the obtained value is expressed in micrometer (<math>\mu\text{m}</math>).</p> <p>Note: When finding Rz, a portion without an exceptionally high peak or low valley, which may be regarded as a flaw, is selected as the sampling length.</p> $Rz = R_p + R_v$	
Ten-Point Mean Roughness	RzJIS	<p>RzJIS shall be that only when the reference length is sampled from the roughness curve in the direction of its mean line, the sum of the average value of absolute values of the heights of five highest profile peaks (<math>Y_p</math>) and the depths of five deepest profile valleys (<math>Y_v</math>) measured in the vertical magnification direction from the mean line of this sampled portion and this sum is expressed in micrometer (<math>\mu\text{m}</math>).</p> $Rz_{JIS} = \frac{(Y_{p1} + Y_{p2} + Y_{p3} + Y_{p4} + Y_{p5}) + (Y_{v1} + Y_{v2} + Y_{v3} + Y_{v4} + Y_{v5})}{5}$	<p><math>Y_{p1}, Y_{p2}, Y_{p3}, Y_{p4}, Y_{p5}</math> : altitudes of the five highest profile peaks of the sampled portion corresponding to the reference length <math>l</math>.</p> <p><math>Y_{v1}, Y_{v2}, Y_{v3}, Y_{v4}, Y_{v5}</math> : altitudes of the five deepest profile valleys of the sampled portion corresponding to the reference length <math>l</math>.</p>

### RELATIONSHIP BETWEEN ARITHMETICAL MEAN (Ra) AND CONVENTIONAL DESIGNATION (REFERENCE DATA)

Arithmetical Mean Roughness Ra		Max. Height Rz	Ten-Point Mean Roughness RzJIS	Sampling Length for Rz • RzJIS l (mm)	Conventional Finish Mark
Standard Series	Cutoff Value $\lambda_c$ (mm)	Standard Series			
0.012 a	0.08	0.05s	0.05z	0.08	▽▽▽▽
0.025 a		0.1 s	0.1 z		
0.05 a	0.25	0.2 s	0.2 z	0.25	
0.1 a		0.4 s	0.4 z		
0.2 a		0.8 s	0.8 z		
0.4 a	0.8	1.6 s	1.6 z	0.8	▽▽▽
0.8 a		3.2 s	3.2 z		
1.6 a		6.3 s	6.3 z		
3.2 a		12.5 s	12.5 z		
6.3 a	2.5	25 s	25 z	2.5	▽▽
12.5 a		50 s	50 z		
25 a	8	100 s	100 z	8	▽
50 a		200 s	200 z		
100 a		400 s	400 z		

Note 1) The correlation among the three is shown for convenience and is not exact.

Note 2) Ra: The evaluation length of Rz and RzJIS is the cutoff value and sampling length multiplied by 5, respectively.

# HARDNESS COMPARISON TABLE

## HARDNESS CONVERSION NUMBERS OF STEEL

Brinell Hardness (HB), 10mm Ball, Load: 3000kgf		Vickers Hardness	Rockwell Hardness				Shore Hardness	Tensile Strength (Approx.) MPa	Brinell Hardness (HB), 10mm Ball, Load: 3000kgf		Vickers Hardness	Rockwell Hardness				Shore Hardness	Tensile Strength (Approx.) MPa
Standard Ball	Tungsten Carbide Ball		A Scale, Load: 60kgf, Diamond Point	B Scale, Load: 100kgf, 1/16" Ball	C Scale, Load: 150kgf, Diamond Point	D Scale, Load: 100kgf, Diamond Point			Standard Ball	Tungsten Carbide Ball		A Scale, Load: 60kgf, Diamond Point	B Scale, Load: 100kgf, 1/16" Ball	C Scale, Load: 150kgf, Diamond Point	D Scale, Load: 100kgf, Diamond Point		
		(HV)	(HRA)	(HRB)	(HRC)	(HRD)	(HS)			(HV)	(HRA)	(HRB)	(HRC)	(HRD)	(HS)	MPa	
—	—	940	85.6	—	68.0	76.9	97	—	429	429	455	73.4	—	45.7	59.7	61	1510
—	—	920	85.3	—	67.5	76.5	96	—	415	415	440	72.8	—	44.5	58.8	59	1460
—	—	900	85.0	—	67.0	76.1	95	—	401	401	425	72.0	—	43.1	57.8	58	1390
—	(767)	880	84.7	—	66.4	75.7	93	—	388	388	410	71.4	—	41.8	56.8	56	1330
—	(757)	860	84.4	—	65.9	75.3	92	—	375	375	396	70.6	—	40.4	55.7	54	1270
—	(745)	840	84.1	—	65.3	74.8	91	—	363	363	383	70.0	—	39.1	54.6	52	1220
—	(733)	820	83.8	—	64.7	74.3	90	—	352	352	372	69.3	(110.0)	37.9	53.8	51	1180
—	(722)	800	83.4	—	64.0	73.8	88	—	341	341	360	68.7	(109.0)	36.6	52.8	50	1130
—	(712)	—	—	—	—	—	—	—	331	331	350	68.1	(108.5)	35.5	51.9	48	1095
—	(710)	780	83.0	—	63.3	73.3	87	—	321	321	339	67.5	(108.0)	34.3	51.0	47	1060
—	(698)	760	82.6	—	62.5	72.6	86	—	—	—	—	—	—	—	—	—	—
—	(684)	740	82.2	—	61.8	72.1	—	—	311	311	328	66.9	(107.5)	33.1	50.0	46	1025
—	(682)	737	82.2	—	61.7	72.0	84	—	302	302	319	66.3	(107.0)	32.1	49.3	45	1005
—	(670)	720	81.8	—	61.0	71.5	83	—	293	293	309	65.7	(106.0)	30.9	48.3	43	970
—	(656)	700	81.3	—	60.1	70.8	—	—	285	285	301	65.3	(105.5)	29.9	47.6	—	950
—	(653)	697	81.2	—	60.0	70.7	81	—	277	277	292	64.6	(104.5)	28.8	46.7	41	925
—	(647)	690	81.1	—	59.7	70.5	—	—	269	269	284	64.1	(104.0)	27.6	45.9	40	895
—	(638)	680	80.8	—	59.2	70.1	80	—	262	262	276	63.6	(103.0)	26.6	45.0	39	875
—	630	670	80.6	—	58.8	69.8	—	—	255	255	269	63.0	(102.0)	25.4	44.2	38	850
—	627	667	80.5	—	58.7	69.7	79	—	248	248	261	62.5	(101.0)	24.2	43.2	37	825
—	—	677	80.7	—	59.1	70.0	—	—	241	241	253	61.8	100	22.8	42.0	36	800
—	601	640	79.8	—	57.3	68.7	77	—	235	235	247	61.4	99.0	21.7	41.4	35	785
—	—	640	79.8	—	57.3	68.7	—	—	229	229	241	60.8	98.2	20.5	40.5	34	765
—	578	615	79.1	—	56.0	67.7	75	—	223	223	234	—	97.3	(18.8)	—	—	—
—	—	607	78.8	—	55.6	67.4	—	—	217	217	228	—	96.4	(17.5)	—	33	725
—	555	591	78.4	—	54.7	66.7	73	2055	212	212	222	—	95.5	(16.0)	—	—	705
—	—	579	78.0	—	54.0	66.1	—	2015	207	207	218	—	94.6	(15.2)	—	32	690
—	534	569	77.8	—	53.5	65.8	71	1985	201	201	212	—	93.8	(13.8)	—	31	675
—	—	533	77.1	—	52.5	65.0	—	1915	197	197	207	—	92.8	(12.7)	—	30	655
—	514	547	76.9	—	52.1	64.7	70	1890	192	192	202	—	91.9	(11.5)	—	29	640
(495)	—	539	76.7	—	51.6	64.3	—	1855	187	187	196	—	90.7	(10.0)	—	—	620
—	495	528	76.3	—	51.0	63.8	68	1820	183	183	192	—	90.0	(9.0)	—	28	615
(477)	—	516	75.9	—	50.3	63.2	—	1780	179	179	188	—	89.0	(8.0)	—	27	600
—	—	508	75.6	—	49.6	62.7	—	1740	174	174	182	—	87.8	(6.4)	—	—	585
—	477	508	75.6	—	49.6	62.7	66	1740	170	170	178	—	86.8	(5.4)	—	26	570
(461)	—	495	75.1	—	48.8	61.9	—	1680	167	167	175	—	86.0	(4.4)	—	—	560
—	—	491	74.9	—	48.5	61.7	—	1670	163	163	171	—	85.0	(3.3)	—	25	545
—	461	491	74.9	—	48.5	61.7	65	1670	156	156	163	—	82.9	(0.9)	—	—	525
—	—	474	74.3	—	47.2	61.0	—	1595	149	149	156	—	80.8	—	—	23	505
—	—	472	74.2	—	47.1	60.8	—	1585	143	143	150	—	78.7	—	—	22	490
—	444	472	74.2	—	47.1	60.8	63	1585	137	137	143	—	76.4	—	—	21	460
—	—	474	74.3	—	47.2	61.0	—	1595	131	131	137	—	74.0	—	—	—	450
—	—	472	74.2	—	47.1	60.8	—	1585	126	126	132	—	72.0	—	—	20	435
—	444	472	74.2	—	47.1	60.8	63	1585	121	121	127	—	69.8	—	—	19	415
—	—	472	74.2	—	47.1	60.8	—	1585	116	116	122	—	67.6	—	—	18	400
—	—	472	74.2	—	47.1	60.8	63	1585	111	111	117	—	65.7	—	—	15	385

Note 1) The above list is the same as that of AMS Metals Hand book with tensile strength in approximate metric value and Brinell hardness over a recommended range.

Note 2) 1MPa=1N/mm<sup>2</sup>

Note 3) Figures in ( ) are rarely used and are included for reference. This list has been taken from JIS Handbook Steel I.

# FIT TOLERANCE TABLE (HOLE)

Classification of Standard Dimensions (mm)		Class of Geometrical Tolerance Zone of Holes															
>	≤	B10	C9	C10	D8	D9	D10	E7	E8	E9	F6	F7	F8	G6	G7	H6	H7
—	3	+180	+85	+100	+34	+45	+60	+24	+28	+39	+12	+16	+20	+8	+12	+6	+10
		+140	+60	+60	+20	+20	+20	+14	+14	+14	+6	+6	+6	+2	+2	0	0
3	6	+188	+100	+118	+48	+60	+78	+32	+38	+50	+18	+22	+28	+12	+16	+8	+12
		+140	+70	+70	+30	+30	+30	+20	+20	+20	+10	+10	+10	+4	+4	0	0
6	10	+208	+116	+138	+62	+76	+98	+40	+47	+61	+22	+28	+35	+14	+20	+9	+15
		+150	+80	+80	+40	+40	+40	+25	+25	+25	+13	+13	+13	+5	+5	0	0
10	14	+220	+138	+165	+77	+93	+120	+50	+59	+75	+27	+34	+43	+17	+24	+11	+18
		+150	+95	+95	+50	+50	+50	+32	+32	+32	+16	+16	+16	+6	+6	0	0
14	18	+244	+162	+194	+98	+117	+149	+61	+73	+92	+33	+41	+53	+20	+28	+13	+21
		+160	+110	+110	+65	+65	+65	+40	+40	+40	+20	+20	+20	+7	+7	0	0
18	24	+270	+182	+220	+119	+142	+180	+75	+89	+112	+41	+50	+64	+25	+34	+16	+25
		+170	+120	+120	+80	+80	+80	+50	+50	+50	+25	+25	+25	+9	+9	0	0
30	40	+280	+192	+230	+146	+174	+220	+90	+106	+134	+49	+60	+76	+29	+40	+19	+30
		+180	+130	+130	+100	+100	+100	+60	+60	+60	+30	+30	+30	+10	+10	0	0
40	50	+310	+214	+260	+174	+207	+260	+107	+126	+159	+58	+71	+90	+34	+47	+22	+35
		+190	+140	+140	+120	+120	+120	+72	+72	+72	+36	+36	+36	+12	+12	0	0
50	65	+320	+224	+270	+208	+245	+305	+125	+148	+185	+68	+83	+106	+39	+54	+25	+40
		+200	+150	+150	+145	+145	+145	+85	+85	+85	+43	+43	+43	+14	+14	0	0
65	80	+470	+330	+390	+242	+285	+355	+146	+172	+215	+79	+96	+122	+44	+61	+29	+46
		+310	+230	+230	+170	+170	+170	+100	+100	+100	+50	+50	+50	+15	+15	0	0
80	100	+525	+355	+425	+271	+320	+400	+162	+191	+240	+88	+108	+137	+49	+69	+32	+52
		+340	+240	+240	+190	+190	+190	+110	+110	+110	+56	+56	+56	+17	+17	0	0
100	120	+565	+375	+445	+299	+350	+440	+182	+214	+265	+98	+119	+151	+54	+75	+36	+57
		+380	+260	+260	+210	+210	+210	+125	+125	+125	+62	+62	+62	+18	+18	0	0
120	140	+605	+395	+465	+327	+385	+480	+198	+232	+290	+108	+131	+165	+60	+83	+40	+63
		+420	+280	+280	+230	+230	+230	+135	+135	+135	+68	+68	+68	+20	+20	0	0
140	160	+690	+430	+510	+355	+445	+555	+215	+255	+315	+115	+145	+185	+65	+95	+45	+75
		+480	+300	+300	+240	+240	+240	+150	+150	+150	+75	+75	+75	+25	+25	0	0
160	180	+750	+460	+540	+327	+385	+480	+198	+232	+290	+108	+131	+165	+60	+83	+40	+63
		+540	+330	+330	+230	+230	+230	+135	+135	+135	+68	+68	+68	+20	+20	0	0
180	200	+830	+500	+590	+327	+385	+480	+198	+232	+290	+108	+131	+165	+60	+83	+40	+63
		+600	+360	+360	+230	+230	+230	+135	+135	+135	+68	+68	+68	+20	+20	0	0
200	225	+910	+540	+630	+327	+385	+480	+198	+232	+290	+108	+131	+165	+60	+83	+40	+63
		+680	+400	+400	+230	+230	+230	+135	+135	+135	+68	+68	+68	+20	+20	0	0
225	250	+1010	+595	+690	+327	+385	+480	+198	+232	+290	+108	+131	+165	+60	+83	+40	+63
		+760	+440	+440	+230	+230	+230	+135	+135	+135	+68	+68	+68	+20	+20	0	0
250	280	+1090	+635	+730	+327	+385	+480	+198	+232	+290	+108	+131	+165	+60	+83	+40	+63
		+840	+480	+480	+230	+230	+230	+135	+135	+135	+68	+68	+68	+20	+20	0	0
280	315	+1100	+645	+740	+327	+385	+480	+198	+232	+290	+108	+131	+165	+60	+83	+40	+63
		+840	+480	+480	+230	+230	+230	+135	+135	+135	+68	+68	+68	+20	+20	0	0
315	355	+1100	+645	+740	+327	+385	+480	+198	+232	+290	+108	+131	+165	+60	+83	+40	+63
		+840	+480	+480	+230	+230	+230	+135	+135	+135	+68	+68	+68	+20	+20	0	0
355	400	+1100	+645	+740	+327	+385	+480	+198	+232	+290	+108	+131	+165	+60	+83	+40	+63
		+840	+480	+480	+230	+230	+230	+135	+135	+135	+68	+68	+68	+20	+20	0	0
400	450	+1100	+645	+740	+327	+385	+480	+198	+232	+290	+108	+131	+165	+60	+83	+40	+63
		+840	+480	+480	+230	+230	+230	+135	+135	+135	+68	+68	+68	+20	+20	0	0
450	500	+1100	+645	+740	+327	+385	+480	+198	+232	+290	+108	+131	+165	+60	+83	+40	+63
		+840	+480	+480	+230	+230	+230	+135	+135	+135	+68	+68	+68	+20	+20	0	0

Note 1) Values shown in the upper portion of the respective boxes are the upper dimensional tolerance, while values shown in the lower portion are the lower dimensional tolerance.



## Class of Geometrical Tolerance Zone of Holes

H8	H9	H10	JS6	JS7	K6	K7	M6	M7	N6	N7	P6	P7	R7	S7	T7	U7	X7
+14 0	+25 0	+40 0	$\pm 3$	$\pm 5$	0 -6	0 -10	-2 -8	-2 -12	-4 -10	-4 -14	-6 -12	-6 -16	-10 -20	-14 -24	-	-18 -28	-20 -30
+18 0	+30 0	+48 0	$\pm 4$	$\pm 6$	+2 -6	+3 -9	-1 -9	0 -12	-5 -13	-4 -16	-9 -17	-8 -20	-11 -23	-15 -27	-	-19 -31	-24 -36
+22 0	+36 0	+58 0	$\pm 4.5$	$\pm 7$	+2 -7	+5 -10	-3 -12	0 -15	-7 -16	-4 -19	-12 -21	-9 -24	-13 -28	-17 -32	-	-22 -37	-28 -43
+27 0	+43 0	+70 0	$\pm 5.5$	$\pm 9$	+2 -9	+6 -12	-4 -15	0 -18	-9 -20	-5 -23	-15 -26	-11 -29	-16 -34	-21 -39	-	-26 -44	-33 -51 -56
+33 0	+52 0	+84 0	$\pm 6.5$	$\pm 10$	+2 -11	+6 -15	-4 -17	0 -21	-11 -24	-7 -28	-18 -31	-14 -35	-20 -41	-27 -48	-	-33 -54	-46 -67 -77
+39 0	+62 0	+100 0	$\pm 8$	$\pm 12$	+3 -13	+7 -18	-4 -20	0 -25	-12 -28	-8 -33	-21 -37	-17 -42	-25 -50	-34 -59	-39 -64 -70	-51 -76 -86	-
+46 0	+74 0	+120 0	$\pm 9.5$	$\pm 15$	+4 -15	+9 -21	-5 -24	0 -30	-14 -33	-9 -39	-26 -45	-21 -51	-30 -60 -62	-42 -72 -78	-55 -85 -94	-76 -106 -121	-
+54 0	+87 0	+140 0	$\pm 11$	$\pm 17$	+4 -18	+10 -25	-6 -28	0 -35	-16 -38	-10 -45	-30 -52	-24 -59	-38 -73 -81	-58 -93 -101	-78 -113 -126	-111 -146 -166	-
+63 0	+100 0	+160 0	$\pm 12.5$	$\pm 20$	+4 -21	+12 -28	-8 -33	0 -40	-20 -45	-12 -52	-36 -61	-28 -68	-48 -88 -90 -93	-77 -117 -125 -133	-107 -147 -159 -171	-	-
+72 0	+115 0	+185 0	$\pm 14.5$	$\pm 23$	+5 -24	+13 -33	-8 -37	0 -46	-22 -51	-14 -60	-41 -70	-33 -79	-60 -106 -109 -113	-113 -159 -123 -169	-	-	-
+81 0	+130 0	+210 0	$\pm 16$	$\pm 26$	+5 -27	+16 -36	-9 -41	0 -52	-25 -57	-14 -66	-47 -79	-36 -88	-74 -126 -78 -130	-	-	-	-
+89 0	+140 0	+230 0	$\pm 18$	$\pm 28$	+7 -29	+17 -40	-10 -46	0 -57	-26 -62	-16 -73	-51 -87	-41 -98	-87 -144 -93 -150	-	-	-	-
+97 0	+155 0	+250 0	$\pm 20$	$\pm 31$	+8 -32	+18 -45	-10 -50	0 -63	-27 -67	-17 -80	-55 -95	-45 -108	-103 -166 -109 -172	-	-	-	-

# FIT TOLERANCE TABLE (SHAFT)

Classification of Standard Dimensions (mm)		Class of Geometrical Tolerance Zone of Shafts														
>	≤	b9	c9	d8	d9	e7	e8	e9	f6	f7	f8	g5	g6	h5	h6	h7
-	3	-140	-60	-20	-20	-14	-14	-14	-6	-6	-6	-2	-2	0	0	0
		-165	-85	-34	-45	-24	-28	-39	-12	-16	-20	-6	-8	-4	-6	-10
3	6	-140	-70	-30	-30	-20	-20	-20	-10	-10	-10	-4	-4	0	0	0
		-170	-100	-48	-60	-32	-38	-50	-18	-22	-28	-9	-12	-5	-8	-12
6	10	-150	-80	-40	-40	-25	-25	-25	-13	-13	-13	-5	-5	0	0	0
		-186	-116	-62	-76	-40	-47	-61	-22	-28	-35	-11	-14	-6	-9	-15
10	14	-150	-95	-50	-50	-32	-32	-32	-16	-16	-16	-6	-6	0	0	0
		-193	-138	-77	-93	-50	-59	-75	-27	-34	-43	-14	-17	-8	-11	-18
14	18	-150	-95	-50	-50	-32	-32	-32	-16	-16	-16	-6	-6	0	0	0
		-193	-138	-77	-93	-50	-59	-75	-27	-34	-43	-14	-17	-8	-11	-18
18	24	-160	-110	-65	-65	-40	-40	-40	-20	-20	-20	-7	-7	0	0	0
		-212	-162	-98	-117	-61	-73	-92	-33	-41	-53	-16	-20	-9	-13	-21
24	30	-160	-110	-65	-65	-40	-40	-40	-20	-20	-20	-7	-7	0	0	0
		-212	-162	-98	-117	-61	-73	-92	-33	-41	-53	-16	-20	-9	-13	-21
30	40	-170	-120	-80	-80	-50	-50	-50	-25	-25	-25	-9	-9	0	0	0
		-232	-182	-119	-142	-75	-89	-112	-41	-50	-64	-20	-25	-11	-16	-25
40	50	-180	-130	-119	-142	-75	-89	-112	-41	-50	-64	-20	-25	-11	-16	-25
		-242	-192	-119	-142	-75	-89	-112	-41	-50	-64	-20	-25	-11	-16	-25
50	65	-190	-140	-100	-100	-60	-60	-60	-30	-30	-30	-10	-10	0	0	0
		-264	-214	-100	-100	-60	-60	-60	-30	-30	-30	-10	-10	0	0	0
65	80	-200	-150	-146	-174	-90	-106	-134	-49	-60	-76	-23	-29	-13	-19	-30
		-274	-224	-146	-174	-90	-106	-134	-49	-60	-76	-23	-29	-13	-19	-30
80	100	-220	-170	-120	-120	-72	-72	-72	-36	-36	-36	-12	-12	0	0	0
		-307	-257	-120	-120	-72	-72	-72	-36	-36	-36	-12	-12	0	0	0
100	120	-240	-180	-174	-207	-107	-126	-159	-58	-71	-90	-27	-34	-15	-22	-35
		-327	-267	-174	-207	-107	-126	-159	-58	-71	-90	-27	-34	-15	-22	-35
120	140	-260	-200	-145	-145	-85	-85	-85	-43	-43	-43	-14	-14	0	0	0
		-360	-300	-145	-145	-85	-85	-85	-43	-43	-43	-14	-14	0	0	0
140	160	-280	-210	-208	-245	-125	-148	-185	-68	-83	-106	-32	-39	-18	-25	-40
		-380	-310	-208	-245	-125	-148	-185	-68	-83	-106	-32	-39	-18	-25	-40
160	180	-310	-230	-208	-245	-125	-148	-185	-68	-83	-106	-32	-39	-18	-25	-40
		-410	-330	-208	-245	-125	-148	-185	-68	-83	-106	-32	-39	-18	-25	-40
180	200	-340	-240	-170	-170	-100	-100	-100	-50	-50	-50	-15	-15	0	0	0
		-455	-355	-170	-170	-100	-100	-100	-50	-50	-50	-15	-15	0	0	0
200	225	-380	-260	-242	-285	-146	-172	-215	-79	-96	-122	-35	-44	-20	-29	-46
		-495	-375	-242	-285	-146	-172	-215	-79	-96	-122	-35	-44	-20	-29	-46
225	250	-420	-280	-242	-285	-146	-172	-215	-79	-96	-122	-35	-44	-20	-29	-46
		-535	-395	-242	-285	-146	-172	-215	-79	-96	-122	-35	-44	-20	-29	-46
250	280	-480	-300	-190	-190	-110	-110	-110	-56	-56	-56	-17	-17	0	0	0
		-610	-430	-190	-190	-110	-110	-110	-56	-56	-56	-17	-17	0	0	0
280	315	-540	-330	-271	-320	-162	-191	-240	-88	-108	-137	-40	-49	-23	-32	-52
		-670	-460	-271	-320	-162	-191	-240	-88	-108	-137	-40	-49	-23	-32	-52
315	355	-600	-360	-210	-210	-125	-125	-125	-62	-62	-62	-18	-18	0	0	0
		-740	-500	-210	-210	-125	-125	-125	-62	-62	-62	-18	-18	0	0	0
355	400	-680	-400	-299	-350	-182	-214	-265	-98	-119	-151	-43	-54	-25	-36	-57
		-820	-540	-299	-350	-182	-214	-265	-98	-119	-151	-43	-54	-25	-36	-57
400	450	-760	-440	-230	-230	-135	-135	-135	-68	-68	-68	-20	-20	0	0	0
		-915	-595	-230	-230	-135	-135	-135	-68	-68	-68	-20	-20	0	0	0
450	500	-840	-480	-327	-385	-198	-232	-290	-108	-131	-165	-47	-60	-27	-40	-63
		-995	-635	-327	-385	-198	-232	-290	-108	-131	-165	-47	-60	-27	-40	-63

Note 1) Values shown in the upper portion of the respective boxes are the upper dimensional tolerance, while values shown in the lower portion are the lower dimensional tolerance.

## Class of Geometrical Tolerance Zone of Shafts

h8	h9	js5	js6	js7	k5	k6	m5	m6	n6	p6	r6	s6	t6	u6	x6
0 -14	0 -25	$\pm 2$	$\pm 3$	$\pm 5$	+4 0	+6 0	+6 +2	+8 +2	+10 +4	+12 +6	+16 +10	+20 +14	—	+24 +18	+26 +20
0 -18	0 -30	$\pm 2.5$	$\pm 4$	$\pm 6$	+6 +1	+9 +1	+9 +4	+12 +4	+16 +8	+20 +12	+23 +15	+27 +19	—	+31 +23	+36 +28
0 -22	0 -36	$\pm 3$	$\pm 4.5$	$\pm 7$	+7 +1	+10 +1	+12 +6	+15 +6	+19 +10	+24 +15	+28 +19	+32 +23	—	+37 +28	+43 +34
0 -27	0 -43	$\pm 4$	$\pm 5.5$	$\pm 9$	+9 +1	+12 +1	+15 +7	+18 +7	+23 +12	+29 +18	+34 +23	+39 +28	—	+44 +33	+51 +40 +56 +45
0 -33	0 -52	$\pm 4.5$	$\pm 6.5$	$\pm 10$	+11 +2	+15 +2	+17 +8	+21 +8	+28 +15	+35 +22	+41 +28	+48 +35	—	+54 +41	+67 +54 +77 +64
0 -39	0 -62	$\pm 5.5$	$\pm 8$	$\pm 12$	+13 +2	+18 +2	+20 +9	+25 +9	+33 +17	+42 +26	+50 +34	+59 +43	+64 +48 +70 +54	+76 +60 +86 +70	—
0 -46	0 -74	$\pm 6.5$	$\pm 9.5$	$\pm 15$	+15 +2	+21 +2	+24 +11	+30 +11	+39 +20	+51 +32	+60 +41 +62 +43	+72 +53 +78 +59	+85 +66 +94 +75	+106 +87 +121 +102	—
0 -54	0 -87	$\pm 7.5$	$\pm 11$	$\pm 17$	+18 +3	+25 +3	+28 +13	+35 +13	+45 +23	+59 +37	+73 +51 +76 +54	+93 +71 +101 +79	+113 +91 +126 +104	+146 +124 +166 +144	—
0 -63	0 -100	$\pm 9$	$\pm 12.5$	$\pm 20$	+21 +3	+28 +3	+33 +15	+40 +15	+52 +27	+68 +43	+88 +63 +90 +65 +93 +68	+117 +92 +125 +100 +133 +108	+147 +122 +159 +134 +171 +146	—	—
0 -72	0 -115	$\pm 10$	$\pm 14.5$	$\pm 23$	+24 +4	+33 +4	+37 +17	+46 +17	+60 +31	+79 +50	+106 +77 +109 +80 +113 +84	+151 +122 +159 +130 +169 +140	—	—	—
0 -81	0 -130	$\pm 11.5$	$\pm 16$	$\pm 26$	+27 +4	+36 +4	+43 +20	+52 +20	+66 +34	+88 +56	+126 +94 +130 +98	—	—	—	—
0 -89	0 -140	$\pm 12.5$	$\pm 18$	$\pm 28$	+29 +4	+40 +4	+46 +21	+57 +21	+73 +37	+98 +62	+144 +108 +150 +114	—	—	—	—
0 -97	0 -155	$\pm 13.5$	$\pm 20$	$\pm 31$	+32 +5	+45 +5	+50 +23	+63 +23	+80 +40	+108 +68	+166 +126 +172 +132	—	—	—	—

# INTERNATIONAL SYSTEM OF UNITS

**UNIT CONVERSION TABLE for EASIER CHANGE into SI UNITS**  
(Bold type Indicates SI unit)

● **Pressure**

Pa	kPa	MPa	bar	kgf/cm <sup>2</sup>	atm	mmH <sub>2</sub> O	mmHg or Torr
1	1×10 <sup>-3</sup>	1×10 <sup>-6</sup>	1×10 <sup>-5</sup>	1.01972×10 <sup>-5</sup>	9.86923×10 <sup>-6</sup>	1.01972×10 <sup>-1</sup>	7.50062×10 <sup>-3</sup>
1×10 <sup>3</sup>	1	1×10 <sup>-3</sup>	1×10 <sup>-2</sup>	1.01972×10 <sup>-2</sup>	9.86923×10 <sup>-3</sup>	1.01972×10 <sup>2</sup>	7.50062
1×10 <sup>6</sup>	1×10 <sup>3</sup>	1	1×10	1.01972×10	9.86923	1.01972×10 <sup>5</sup>	7.50062×10 <sup>3</sup>
1×10 <sup>5</sup>	1×10 <sup>2</sup>	1×10 <sup>-1</sup>	1	1.01972	9.86923×10 <sup>-1</sup>	1.01972×10 <sup>4</sup>	7.50062×10 <sup>2</sup>
9.80665×10 <sup>4</sup>	9.80665×10	9.80665×10 <sup>-2</sup>	9.80665×10 <sup>-1</sup>	1	9.67841×10 <sup>-1</sup>	1×10 <sup>4</sup>	7.35559×10 <sup>2</sup>
1.01325×10 <sup>5</sup>	1.01325×10 <sup>2</sup>	1.01325×10 <sup>-1</sup>	1.01325	1.03323	1	1.03323×10 <sup>4</sup>	7.60000×10 <sup>2</sup>
9.80665	9.80665×10 <sup>-3</sup>	9.80665×10 <sup>-6</sup>	9.80665×10 <sup>-5</sup>	1×10 <sup>-4</sup>	9.67841×10 <sup>-5</sup>	1	7.35559×10 <sup>-2</sup>
1.33322×10 <sup>2</sup>	1.33322×10 <sup>-1</sup>	1.33322×10 <sup>-4</sup>	1.33322×10 <sup>-3</sup>	1.35951×10 <sup>-3</sup>	1.31579×10 <sup>-3</sup>	1.35951×10	1

Note 1) 1Pa=1N/m<sup>2</sup>

● **Force**

N	dyn	kgf
1	1×10 <sup>5</sup>	1.01972×10 <sup>-1</sup>
1×10 <sup>-5</sup>	1	1.01972×10 <sup>-6</sup>
9.80665	9.80665×10 <sup>5</sup>	1

● **Stress**

Pa	MPa or N/mm <sup>2</sup>	kgf/mm <sup>2</sup>	kgf/cm <sup>2</sup>
1	1×10 <sup>-6</sup>	1.01972×10 <sup>-7</sup>	1.01972×10 <sup>-5</sup>
1×10 <sup>6</sup>	1	1.01972×10 <sup>-1</sup>	1.01972×10
9.80665×10 <sup>6</sup>	9.80665	1	1×10 <sup>2</sup>
9.80665×10 <sup>4</sup>	9.80665×10 <sup>-2</sup>	1×10 <sup>-2</sup>	1

Note 1) 1Pa=1N/m<sup>2</sup>

● **Work / Energy / Quantity of Heat**

J	kW·h	kgf·m	kcal
1	2.77778×10 <sup>-7</sup>	1.01972×10 <sup>-1</sup>	2.38889×10 <sup>-4</sup>
3.600 ×10 <sup>6</sup>	1	3.67098×10 <sup>5</sup>	8.6000 ×10 <sup>2</sup>
9.80665	2.72407×10 <sup>-6</sup>	1	2.34270×10 <sup>-3</sup>
4.18605×10 <sup>3</sup>	1.16279×10 <sup>-3</sup>	4.26858×10 <sup>2</sup>	1

Note 1) 1J=1W·s, 1J=1N·m

1cal=4.18605J

(By the law of weights and measures)

● **Power (Rate of Production / Motive Power) /Heat Flow Rate**

W	kgf·m/s	PS	kcal/h
1	1.01972×10 <sup>-1</sup>	1.35962×10 <sup>-3</sup>	8.6000 ×10 <sup>-1</sup>
9.80665	1	1.33333×10 <sup>-2</sup>	8.43371
7.355 ×10 <sup>2</sup>	7.5 ×10	1	6.32529×10 <sup>2</sup>
1.16279	1.18572×10 <sup>-1</sup>	1.58095×10 <sup>-3</sup>	1

Note 1) 1W=1J/s, PS:French horse power

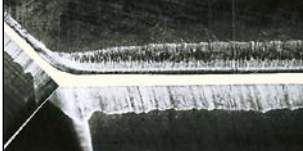
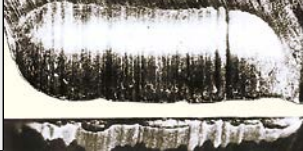




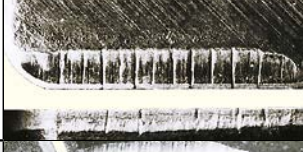




1PS=0.7355kW

1cal=4.18605J

(By the law of weights and measures)

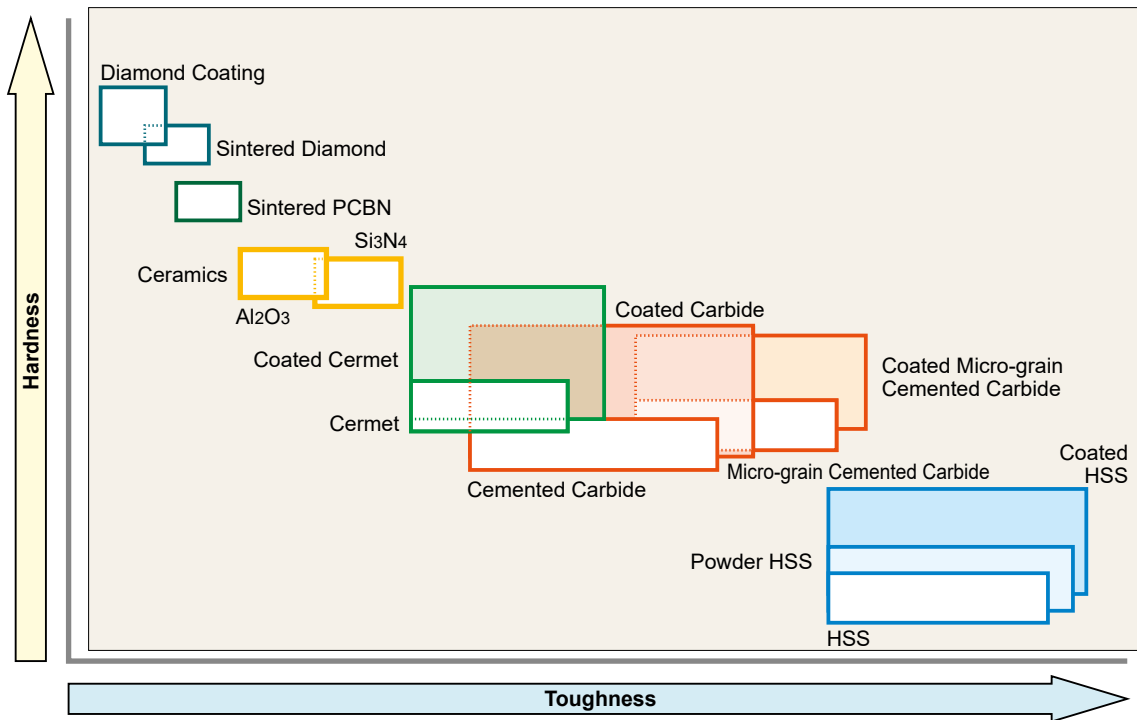
# TOOL WEAR AND DAMAGE

## CAUSES AND COUNTERMEASURES

Tool Damage Form	Cause	Countermeasure
<b>Flank Wear</b> 	<ul style="list-style-type: none"> <li>• Tool grade is too soft.</li> <li>• Cutting speed is too high.</li> <li>• Flank angle is too small.</li> <li>• Feed rate is extremely low.</li> </ul>	<ul style="list-style-type: none"> <li>• Tool grade with high wear resistance.</li> <li>• Lower cutting speed.</li> <li>• Increase flank angle.</li> <li>• Increase feed rate.</li> </ul>
<b>Crater Wear</b> 	<ul style="list-style-type: none"> <li>• Tool grade is too soft.</li> <li>• Cutting speed is too high.</li> <li>• Feed rate is too high.</li> </ul>	<ul style="list-style-type: none"> <li>• Tool grade with high wear resistance.</li> <li>• Lower cutting speed.</li> <li>• Lower feed rate.</li> </ul>
<b>Chipping</b> 	<ul style="list-style-type: none"> <li>• Tool grade is too hard.</li> <li>• Feed rate is too high.</li> <li>• Lack of cutting edge strength.</li> <li>• Lack of shank or holder rigidity.</li> </ul>	<ul style="list-style-type: none"> <li>• Tool grade with high toughness.</li> <li>• Lower feed rate.</li> <li>• Increase honing size. (Round honing is to be changed to chamfer honing.)</li> <li>• Use a large tool shank size.</li> </ul>
<b>Fracture</b> 	<ul style="list-style-type: none"> <li>• Tool grade is too hard.</li> <li>• Feed rate is too high.</li> <li>• Lack of cutting edge strength.</li> <li>• Lack of shank or holder rigidity.</li> </ul>	<ul style="list-style-type: none"> <li>• Tool grade with high toughness.</li> <li>• Lower feed rate.</li> <li>• Increase honing. (Round honing is to be changed to chamfer honing.)</li> <li>• Use large shank size.</li> </ul>
<b>Plastic Deformation</b> 	<ul style="list-style-type: none"> <li>• Tool grade is too soft.</li> <li>• Cutting speed is too high.</li> <li>• Depth of cut and feed rate are too large.</li> <li>• Cutting temperature is high.</li> </ul>	<ul style="list-style-type: none"> <li>• Tool grade with high wear resistance.</li> <li>• Lower cutting speed.</li> <li>• Decrease depth of cut and feed rate.</li> <li>• Tool grade with high thermal conductivity.</li> </ul>
<b>Welding</b> 	<ul style="list-style-type: none"> <li>• Cutting speed is low.</li> <li>• Poor sharpness.</li> <li>• Unsuitable grade.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase cutting speed. (For DIN Ck45, cutting speed 80m/min.)</li> <li>• Increase rake angle.</li> <li>• Tool grade with low affinity. (Coated grade, cermet grade)</li> </ul>
<b>Thermal Cracks</b> 	<ul style="list-style-type: none"> <li>• Expansion or shrinkage due to cutting heat.</li> <li>• Tool grade is too hard.</li> <li>• *Especially in milling.</li> </ul>	<ul style="list-style-type: none"> <li>• Dry cutting. (For wet cutting, flood workpiece with cutting fluid)</li> <li>• Tool grade with high toughness.</li> </ul>
<b>Notching</b> 	<ul style="list-style-type: none"> <li>• Hard surfaces such as uncut surfaces, chilled parts and machining hardened layers.</li> <li>• Friction caused by jagged shape chips. (Caused by small vibration)</li> </ul>	<ul style="list-style-type: none"> <li>• Tool grade with high wear resistance.</li> <li>• Increase rake angle to improve sharpness.</li> </ul>
<b>Flaking</b> 	<ul style="list-style-type: none"> <li>• Cutting edge welding and adhesion.</li> <li>• Poor chip disposal.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase rake angle to improve sharpness.</li> <li>• Enlarge chip pocket.</li> </ul>
<b>Flank Wear Fracture</b> *Damage for polycrystallines 	<ul style="list-style-type: none"> <li>• Damage due to the lack of strength of a curved cutting edge.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase honing.</li> <li>• Tool grade with high toughness.</li> </ul>
<b>Crater Wear Fracture</b> *Damage for polycrystallines 	<ul style="list-style-type: none"> <li>• Tool grade is too soft.</li> <li>• Cutting resistance is too high and causes high cutting heat.</li> </ul>	<ul style="list-style-type: none"> <li>• Decrease honing.</li> <li>• Tool grade with high wear resistance.</li> </ul>

# CUTTING TOOL MATERIALS

Cemented carbide (WC-Co) was developed in 1923 and was later improved by adding TiC and TaC. In 1969, CVD coating technology was developed and coated carbide has since been widely used. TiC-TiN based cermet was developed in 1974. Today, "Coated carbide grades for roughing and cermet for finishing" is a well established method.



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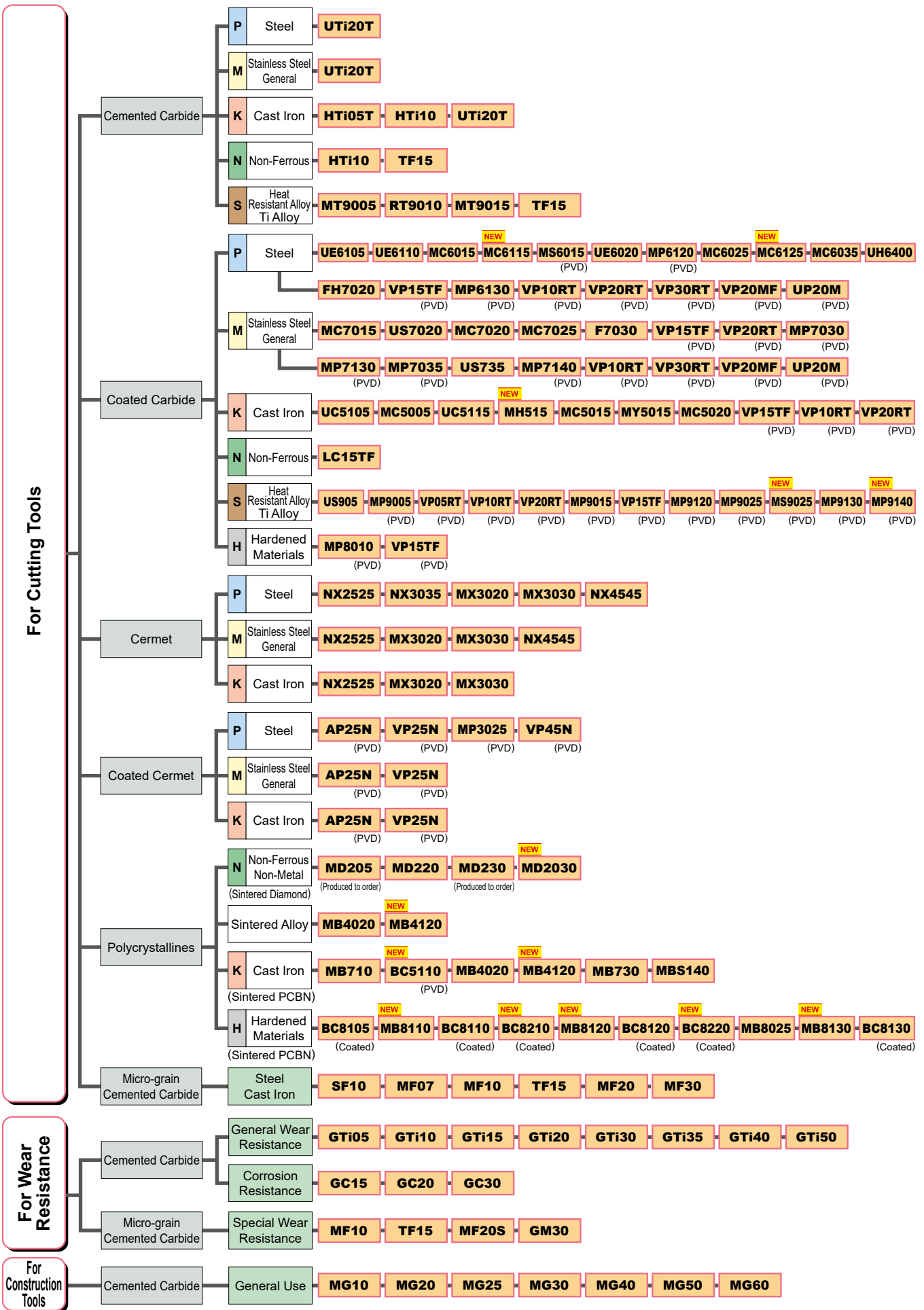
## GRADE CHARACTERISTICS

Hard Materials	Hardness (HV)	Energy Formation (kcal/g·atom)	Solubility in Iron (%.1250°C)	Thermal Conductivity (W/m·k)	Thermal * Expansion (x 10 <sup>-6</sup> /k)	Tool Material
Diamond	>9000	–	Highly Soluble	2100	3.1	Sintered Diamond
PCBN	>4500	–	–	1300	4.7	Sintered PCBN
Si <sub>3</sub> N <sub>4</sub>	1600	–	–	100	3.4	Ceramics
Al <sub>2</sub> O <sub>3</sub>	2100	-100	≠0	29	7.8	Ceramics Cemented Carbide
TiC	3200	-35	< 0.5	21	7.4	Cermet Coated Carbide
TiN	2500	-50	–	29	9.4	Cermet Coated Carbide
TaC	1800	-40	0.5	21	6.3	Cemented Carbide
WC	2100	-10	7	121	5.2	Cemented Carbide

\*1W/m·K=2.39×10<sup>-3</sup>cal/cm·sec·°C

TECHNICAL DATA

# GRADE CHAIN



TECHNICAL DATA

# GRADES COMPARISON TABLE

## CEMENTED CARBIDE

Classification	ISO	Mitsubishi Materials	Sandvik	Kennametal	Seco Tools	Iscar	Sumitomo Electric	Tungaloy	Kyocera	Dijet	MOLDINO	
	Symbol											
Turning	P	P01										
		P10				IC70	ST10P	TH10			WS10	
		P20	UTi20T				IC70 IC50M	ST20E	KS20			EX35
		P30	UTi20T				IC50M IC54	A30 A30N	UX30 KS15F			EX35
		P40					IC54	ST40E	TX40			EX35
	M	M10			KU10 K313 K68	890	IC07	EH510	TH10			WA10B
		M20	UTi20T		KU10 K313 K68	HX 883	IC07 IC08 IC20	EH520	KS20			EX35
		M30	UTi20T				IC08 IC20 IC28	A30 A30N	UX30			EX35
		M40					IC28		TU40			
	K	K01	HTi05T		KU10 K313 K68			H1 H2	KS05F			WH01 WH05
		K10	HTi10		KU10 K313 K68	890	IC20	EH510	TH10	KW10 GW15	KT9	WH10
		K20	UTi20T	H13A	KU10 K313 K68	HX	IC20	G10E H10E EH520	KS15F KS20	GW25	KT9	WH20
		K30	UTi20T			883		G10E H10E				
	N	N01		H10				H1 H2	KS05F	GW05 KW10		
		N10	HTi10	H10 HBA	KU10 K313 K68	890	IC08 IC20	EH510	TH10	KW10 GW15	KT9	WH10
		N20		H10 HBA	KU10 K313 K68	HX KX	IC08 IC20	G10E EH520	KS15F		KT9	WH20
		N30				883						
	S	S01	MT9005							SW05		
		S10	MT9005 RT9010 MT9015	H10A H10F H13A	KU10 K313 K68	HX 883	IC07 IC08	EH510	KS05F TH10	SW10		WH13S
		S20	RT9010 TF15		KU10 K313 K68	883	IC07 IC08	EH520	KS15F KS20	SW25		
S30		TF15										
Milling	P	P10										
		P20	UTi20T		K125M		IC50M IC28	A30N			EX35	
		P30	UTi20T	SM30	GX		IC50M IC28	A30N	UX30		EX35	
		P40					IC28				EX35	
	M	M10										
		M20	UTi20T				IC08 IC20	A30N				EX35
		M30	UTi20T	SM30			IC08 IC28	A30N				EX35
		M40					IC28					
	K	K01	HTi05T		K115M,K313							
		K10	HTi10		K115M K313		IC20	G10E	TH10	KW10 GW25	KT9	WH10
		K20	UTi20T	H13A		HX	IC20	G10E		GW25	FZ15	WH20
		K30	UTi20T									

Note 1) The tables above are based on published data and not authorized by each manufacturer.

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TECHNICAL DATA



## MICRO GRAIN

Classification	ISO	Mitsubishi	Sandvik	Kennametal	Seco	Sumitomo	Tungaloy	Kyocera	Dijet	MOLDINO	
	Symbol	Materials			Tools	Electric					
Cutting Tools	Z	Z01	SF10 MF07 MF10	PN90 6UF,H3F 8UF,H6F			F0	F MD05F MD1508		FZ05 FB05 FB10	NM08
		Z10	HTi10 MF20	H10F		890	XF1 F1 AFU	MD10 MD0508 MD07F	FW30	FZ10 FZ15 FB15	NM10 NM12 NM15
		Z20	TF15 MF30	H15F		890 883	AF0 SF2 AF1	EM10 MD20 G1F		FZ15 FB15 FB20	BRM20 EF20N
		Z30				883	A1 CC			FZ20 FB20	NM25 NM40

## CERMET

Classification	ISO	Mitsubishi	Sandvik	Kennametal	Seco	Iscar	Sumitomo	Tungaloy	Kyocera	Dijet	MOLDINO	
	Symbol	Materials			Tools		Electric					
Turning	P	P01	AP25N* VP25N*				IC20N IC520N*	T1000A	NS520 GT720*	CCX* TN610 PV710* PV30*		
		P10	NX2525 AP25N* VP25N*	CT5015 GC1525*	KT315 KT125	TP1020 TP1030* CM CMP*	IC20N IC520N* IC530N*	T1500A T1500Z*	NS520 NS9530 GT9530* AT9530*	CCX* TN60 TN610 PV710* TN620 PV720*	CX75	CZ25*
		P20	NX2525 AP25N* VP25N* NX3035 MP3025*	GC1525*	KT325 KT1120 KT5020*	TP1020 TP1030*	IC20N IC520N* IC30N IC530N* IC75T	T1500A T1500Z* T2500A T2500Z* T3000Z*	NS9530 GT9530* AT9530*	TN60 TN620 PV720* TN6020	CX75 PX90*	CH550
		P30	MP3025* VP45N*				IC75T	T3000Z*		PV730* PV90*	PX90*	
	M	M10	NX2525 AP25N* VP25N*	GC1525*	KT125	TP1020 TP1030* CM CMP*		T1000A T1500Z*		TN60 TN620 PV720* TN6020		CZ25*
		M20	NX2525 AP25N* VP25N*					T1500A T1500Z*		TN90 TN6020 TN620 PV720* PV90*		CH550
		M30								PV730*		
	K	K01	NX2525 AP25N*					T1000A	NS520 GT720*	CCX* PV7005*		
		K10	NX2525 AP25N*	CT5015	KT325 KT125				NS520 NS9530 GT9530*	CCX* PV7005* TN60		CZ25*
		K20	NX2525 AP25N*									CH550
	Milling	P	P10	NX2525		C15M	IC30N			TN620M TN60	CX75	MZ1000*
			P20	MX3020 NX2525	CT530	KT530M HT7 KT605M	C15M MP1020	IC30N	T250A T2500A		TN100M TN620M TN60	CX75 CX90
P30			MX3030 NX4545				IC30N	T4500A	NS740		CX90	CH7035
M		M10	NX2525				IC30N			TN60		
		M20	MX3020 NX2525	CT530	KT530M HT7 KT605M	C15M	IC30N	T250A T2500A		TN100M	CX75	
		M30	MX3030 NX4545					T4500A				
K		K01										
		K10	NX2525							TN60	CX75	
		K20	NX2525		KT530M HT7						CX75	

\*Coated Cermet

Note 1) The tables above are based on published data and not authorized by each manufacturer.

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TECHNICAL DATA

# GRADES COMPARISON TABLE

## CVD COATED GRADE

Classification	ISO	Mitsubishi Materials	Sandvik	Kennametal	Seco Tools	Iscar	Sumitomo Electric	Tungaloy	Kyocera	Dijet	MOLDINO			
	Symbol													
Turning	P	P01	MC6115 UE6105	GC4305 GC4205 GC4415	KCP05B KCP05 KC9105	TP0501 TP0500 TP1501 TP1500	IC9150 IC8150 IC428	AC810P AC700G	T9105 T9025	CA510 CA5505	JC110V	HG8010		
		P10	MC6115 UE6105 MC6015 UE6110 MY5015	GC4315 GC4215 GC4325 GC4415	KCP10B KCP10 KCP25 KC9110	TP1501 TP1500 TP2501 TP2500	IC9150 IC8150 IC8250	AC810P AC700G AC820P AC2000 AC8015P	T9105 T9115 T9215	CA510 CA5505 CA515 CA5515	JC110V JC215V	HG8010 HG8025 GM8020		
		P20	MC6115 MC6015 UE6110 MC6125 MC6025 UE6020 MY5015	GC4315 GC4215 GC4325 GC4425	KCP25B KCP30B KCP25 KC9125	TP2501 TP2500	IC8250 IC9250 IC8350	AC820P AC2000 AC8025P AC830P	T9115 T9125 T9215 T9225	CA025P CA515 CA5515 CA525 CA5525 CR9025	JC110V JC215V	HG8025 GM8020 GM25		
		P30	MC6125 MC6025 UE6020 MC6035 UH6400	GC4325 GC4335 GC4225 GC4235 GC4425	KCP30B KCP30	TP3501 TP3500 TP3000	IC8350 IC9250 IC9350	AC8035P AC830P AC630M	T9125 T9135 T9225 T9235	CA025P CA525 CA5525 CA530 CA5535 CR9025	JC215V JC325V	GM25 GM8035		
		P40	MC6035 UH6400	GC4235 GC4335	KCP40 KCP40B KC9140 KC9240	TP3501 TP3500 TP3000	IC9350	AC8035P AC630M	T9135 T9035 T9235	CA530 CA5535	JC325V	GM8035 GX30		
	M	M10	MC7015 US7020	GC2015 GC2220	KCM15B KCM15	TM1501 TM2000	IC6015 IC8250	AC610M AC6020M	T6120 T9215	CA6515	JX605X JC110V			
		M20	MC7015 US7020 MC7025	GC2015 GC2220	KCM15 KCM25B KCP40B	TM2000 TM2501	IC6015	AC6020M AC610M AC6030M AC630M	T6120 T9215	CA6515 CA6525	JC110V	HG8025 GM25		
		M30	MC7025 US735	GC2025	KCM25 KCM35B KCP40	TM4000 TM3501	IC6025	AC6030M AC630M	T6130	CA6525	JX525X	GM8035 GX30		
		M40	US735	GC2025	KCM35B KCM35	TM4000 TM3501	IC6025	AC6030M AC630M			JX525X	GX30		
	K	K01	MC5005 UC5105	GC3205 GC3210	KCK05B KCK05	TK0501 TH1500	IC5005	AC405K AC410K AC4010K	T505 T515 T5105	CA4505 CA4010 CA310	JC050W JC105V	HX3505		
		K10	MC5015 MH515 UC5115 MY5015	GC3205 GC3210	KCK15B KCK15 KCK20 KC9315 KCK20B	TK0501 TK1501	IC5005 IC5010 IC428	AC405K AC4010K AC410K AC4015K AC415K	T515 T5115	CA315 CA4515 CA4010 CA4115	JC108W JC050W JC105V JC110V	HX3515 HG8010		
		K20	MC5015 MH515 UC5115 UE6110 MY5015	GC3225	KCK20B KCK20 KCPK05	TK1501	IC5010 IC8150	AC4015K AC415K AC420K AC8025P	T5115 T5125	CA320 CA4515 CA4115 CA4120	JC108W JC110V JC215V	HG8025 GM8020		
		K30	UE6110	GC3225	KCPK05			AC8025P	T5125		JC215	HG8025 GM8020		
	S	S01	US905	S05F S205						CA6515 CA6525 CA6535		HS9105 HS9115		
	Milling	P	P10				MP1501	IC5400	ACP2000 XCU2500 ACP100			JC730U		
			P20	F7030 MC7020	GC4220		MP1501 MP2501 T25M	IC5500	ACP2000 ACP3000 XCU2500 ACP100	T3130 T3225		JC730U JC835S	GX2140 GF30	
			P30	F7030 MC7020	GC4330 GC4230	KCPK30 KC930M	MP1501 MP2501 TM25 T350	IC5500	ACP3000 XCU2500 ACP100	T3130 T3225		JC835S JC730U	GX2140 GX2160 GF30	
			P40		GC4340 GC4240	KC935M KC530M	MM4500 T350M						GX2030 GX2160	
		M	M10						XCU2500			JC730U		
			M20	US735 MC7020		KC925M	MP2501 MS2500 T25M T350M		ACP100 ACM200 XCU2500	T3130 T3225	CA6535	JC730U JC835S	AX2040 GX2140	
M30			US735 FC7020 MC7020	GC2040	KC930M	MP2501 T25M T350M		ACP100 XCU2500 ACM200	T3130 T3225	CA6535	JC730U JC835S	AX2040 GX2140 GX2160 GX30		
M40					KC930M KC935M	MM4500 T350M						GX2160		
K		K01												
		K10	MC5020					XCK2000 ACK200	T1215 T1115	CA420M	JC605W	GX2120		
		K20	MC5020	GC3220 GC3330 K20W	KC915M	MP1501	IC5100	ACK200 XCK2500 XCK2000 ACK200	T1115		JC610 JC605W JC608X	GX2120		
		K30		GC3330 GC3040	KC920M KC925M KCPK30 KC930M KC935M	MP1501	IC5100 DT7150				JC610			

Note 1) The tables above are based on published data and not authorized by each manufacturer.

## PVD COATED GRADE

Classification	ISO	Mitsubishi	Sandvik	Kennametal	Seco	Iscar	Sumitomo	Tungaloy	Kyocera	Dijet	MOLDINO	
	Symbol	Materials			Tools		Electric					
Turning	<b>P</b>	<b>P01</b>							PR1005			
	<b>P10</b>	VP10MF MS6015	GC1125	KCU10 KC5010 KC5510 KU10T	CP200 TS2000	IC250 IC507 IC570 IC807 IC907 IC908		AH710 SH725	PR1005 PR1705 PR930 PR1025 PR1115 PR1225 PR1425 PR1725			
	<b>P20</b>	VP10RT VP20RT VP15TF VP20MF MS6015	GC1125 GC15	KCU10 KC5025 KC5525 KU25T	TS2500	IC1007 IC250 IC308 IC507 IC807 IC808 IC907 IC908 IC1008 IC1028 IC3028		AH710 AH725 AH120 SH730 GH730 GH130 SH725	PR930 PR1025 PR1725 PR1115 PR1225 PR1425 PR1535		IP2000	
	<b>P30</b>	VP10RT VP20RT VP15TF VP20MF	GC1125	KCU25 KC5525 KU25T	CP500	IC228 IC250 IC328 IC330 IC354 IC528 IC1008 IC1028 IC3028		AH725 AH120 SH730 GH730 GH130 AH740 J740 SH725 AH7025	PR1025 PR1725 PR1225 PR1425 PR1535 PR1625		IP3000	
	<b>P40</b>				CP500 CP600	IC228 IC328 IC528 IC928 IC1008 IC1028 IC3028		AH740 J740	PR1535			
	<b>M</b>	<b>M01</b>										
	<b>M10</b>	VP10MF MS6015	GC1115 GC15 GC1105	KCU10 KC5010 KC5510	CP200 TS2000	IC354 IC507 IC520 IC807 IC907 IC1007 IC5080T		AC8005 AH710 SH725	PR1025 PR1225 PR1425 PR1725	JC5003 JC8015	IP050S	
	<b>M20</b>	VP10RT VP20RT VP15TF VP20MF MS9025	GC1115 GC15 GC1125	KCU10 KC5010 KC5510	TS2500 CP500	IC354 IC808 IC908 IC1008 IC1028 IC3028 IC5080T	AC520U AC5015S	AH710 AH725 AH120 SH730 GH730 GH130 GH330 AH630 SH725 AH8015 AH7025	PR1025 PR1125 PR1225 PR1425 PR915 PR930 PR1535 PR1725	JC5003 JC5015 JC8015 JC5118	IP100S	
	<b>M30</b>	VP10RT VP20RT VP15TF VP20MF MP7035	GC1125 GC2035	KCU25 KC5525	CP500 CP600 TTP2050	IC228 IC250 IC328 IC330 IC1008 IC1028 IC9080T	AC520U AC530U AC1030U AC6040M AC5025S	GH330 AH725 AH120 SH730 GH730 GH130 J740 AH645 SH725	PR1125 PR1725 PR1425 PR1535	JC5015 JC8015 JC5118		
	<b>M40</b>	MP7035	GC2035			IC328 IC928 IC1008 IC1028 IC3028 IC9080T	AC530U AC6040M	J740	PR1535	JC5118		
	<b>K</b>	<b>K01</b>										
	<b>K10</b>		GC15	KCU10 KC5010 KC5510	CP200 TS2000	IC350 IC910 IC1008	AC510U	GH110 AH110 AH710				
	<b>K20</b>	VP10RT VP20RT VP15TF		KCU15 KCU25	CP200 TS2000 TS2500	IC228 IC350 IC808 IC830 IC908 IC1007 IC1008		GH110 AH7025 AH110 AH710 AH725 AH120 GH730 GH130				
	<b>K30</b>	VP10RT VP20RT VP15TF		KCU25 KC5525	CP500	IC228 IC350 IC808 IC830 IC908 IC928 IC1007 IC1008		AH725 AH120 GH730 GH130				
	<b>S</b>	<b>S01</b>	MP9005 VP05RT			TH1000	IC507 IC804 IC807 IC907 IC5080T	AC5005S	AH905 AH8005	PR005S PR1305	JC5003 JC8015	JP9105
	<b>S10</b>	MP9005 MP9015 VP10RT	GC1105 GC15	KCU10 KC5010 KC5410 KC5510	CP200 CP250 TS2000 TS2050 TS2500 TH1000	IC507 IC806 IC807 IC903 IC5080T	AC510U AC5015S	AH905 SH730 AH110 AH8005 AH120	PR005S PR015S PR1310	JC5003 JC5015 JC8015	JP9115	
	<b>S20</b>	MP9015 MT9015	GC1125	KCU10 KCU25 KC5025 KC5525	TS2500 CP500	IC228 IC300 IC328 IC808 IC908 IC928 IC3028 IC806 IC9080T	AC510U AC520U AC5025S	AH120 AH725 AH8015	PR015S PR1125 PR1325	JC5015 JC8015 JC5118		
	<b>S30</b>	MS9025 MP9025 VP15TF VP20RT	GC1125	KC5525	CP600	IC928 IC830	AC1030U	AH725 AH7025	PR1125 PR1535	JC5118		
	Milling	<b>P</b>	<b>P01</b>				IC903				JC8003	ATH80D ATH08M TH308 PN208 JP4105 PN15M
		<b>P10</b>		GC1010 GC1130	KC505M KC715M KC510M KC515M		IC250 IC350 IC808 IC810 IC900 IC903 IC908 IC910 IC950	ACU2500 ACP200		PR830 PR1225	JC8003 JC8015 JC5015 JC5118	PN15M PN215 PCA12M JP4115
<b>P20</b>		MP6120 VP15TF	GC1010 GC1030 GC1130 GC2030	KC522M KC525M KC527M KC610M KC620M KC635M KC715M KC720M KC730M KTPK20	F25M MP3000	IC250 IC300 IC328 IC330 IC350 IC808 IC810 IC830 IC900 IC908 IC910 IC928 IC950 IC1008	ACU2500 ACP200	AH3225 AH725 AH120 GH330 AH330 AH9130 AH6030	PR830 PR1225 PR1230 PR1525	JC5015 JC5040 JC6235 JC8015 JC5118 JC6235 JC7560P JC8118P	CY9020 JP4120 CY150	

Note 1) The tables above are based on published data and not authorized by each manufacturer.

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TECHNICAL DATA

# GRADES COMPARISON TABLE

## PVD COATED GRADE

Classification	ISO	Mitsubishi Materials	Sandvik	Kennametal	Seco Tools	Iscar	Sumitomo Electric	Tungaloy	Kyocera	Dijet	MOLDINO		
	Symbol												
Milling	P	P30	MP6120 VP15TF MP6130 VP30RT	GC1010 GC1030 GC2030 GC1130	KC735M KC725M KC530M KC537M KCPM40	F25M MP3000 F30M MP2050	IC250 IC300 IC328 IC330 IC350 IC830 IC845 IC900 IC928 IC950 IC1008	ACU2500 ACP200 ACP300	AH725 AH120 AH130 AH140 GH130 AH730 AH3035 AH6030 AH3225 AH9130	PR1230 PR1525	JC6235 JC7560 JC8050 JC7560P JC5015 JC8118 JC5040 JC8118P JC8015 JC5118	JS4045 CY250 CY250V CY25 HC844	
			P40	VP30RT	GC2030 GC1030 GC1130	KC735M KC537M KCPM40	F40M T60M	IC300 IC328 IC330 IC830 IC928 IC1008	ACP300	AH140 AH3035	PR1525	JC6235 JC7560 JC8050 JC7560P JC5040 JC8118 JC5118 JC8118P JC5118	JS4060 PTH30E PTH40H JX1060 JS4060
	M	M01					IC907						PN08M PN208
		M10		GC1025 GC1030 GC1010 GC1130	KC715M KC515M		IC903	ACU2500 ACM100		PR1225			PN15M PN215
		M20	VP15TF MP7130 MP7030 VP20RT	GC1025 GC1030 GC1040 GC2030 S30T	KC610M KC635M KC730M KC720M KC522M KC525M KCPM40 KTPK20	F25M MP3000	IC250 IC300 IC808 IC830 IC900 IC908 IC928 IC1008	ACU2500 ACP200	AH725 AH120 GH330 AH330 GH110 AH6030 AH9130	PR1025 PR1225	JC5015 JC5118 JC8015	JP4120	
		M30	VP15TF MP7130 MP7030 VP20RT MP7140 VP30RT	S30T GC1040 GC2030	KC537M KC725M KC735M KCPM40 KC530M	F30M F40M MP3000 MP2050	IC250 IC300 IC328 IC330 IC380 IC830 IC882 IC928 IC1008	ACP200 ACP300 ACM300	AH120 AH725 AH130 AH140 GH130 AH730 GH340 AH9130 AH3135 AH4035	PR830 PR1225 PR1525 PR1535	JC5015 JC7560 JC8015 JC7560P JC8050 JC8118 JC5118 JC8118P	JS4045 CY250 HC844	
		M40	MP7140 VP30RT			F40M MP2050	IC250 IC300 IC328 IC330 IC882 IC1008	ACP300 ACM300	AH140 AH3135 AH4035	PR1525 PR1535	JC5015 JC7560 JC5118 JC7560P JC8050 JC8118 JC8118P	PTH30E PTH40H JM4160	
	K	K01	MP8010						AH110 GH110 AH330		JC8003		ATH80D ATH08M TH308
		K10	MP8010	GC1010	KC514M KC515M KC527M KC635M	MK2050	IC350 IC810 IC830 IC900 IC910 IC928 IC950 IC380 IC1008	ACU2500 ACK3000	AH110 GH110 AH725 AH120 GH130 AH330	PR1210 PR1510	JC8015		ATH10E TH315 CY100H
		K20	VP15TF VP20RT	GC1010 GC1020	KTPK20 KC514M KC610M KC520M KC620M KC524M	MK2000 MK2050	IC350 IC808 IC810 IC830 IC900 IC908 IC910 IC928 IC950 IC1008	ACU2500 ACK300 ACK3000	GH130 AH9130 AH9030	PR1210 PR1510	JC5015 JC8015 JC6235		CY150 JP4120 CY9020 PTH13S
		K30	VP15TF VP20RT	GC1020	KC522M KC725M KC524M KC735M KC537M	MK2050	IC350 IC808 IC830 IC908 IC928 IC950 IC1008	ACK300 ACK3000				JC6235 JC5015 JC8015 JC8118 JC8118P	
	S	S01					IC907 IC908 IC808 IC903		AH110 AH710	PR1210	JC8003 JC8015 JC5118		PN08M PN208
		S10	MP9120 VP15TF	GC1130 GC1010 GC1030 GC2030	KC510M	MS2050	IC903 IC907 IC908 IC840 IC910 IC808	EH520Z EH20Z ACM100	AH120 AH725	PR1210	JC8003 JC5015 JC8015 JC5118		JS1025 JP4120
		S20	MP9120 VP15TF MP9130 MP9030	S30T GC2030 GC1030 GC1130	KC522M KC525M KCSM30 KCPM40	MS2050 MP2050	IC300 IC908 IC808 IC900 IC830 IC928 IC328 IC330 IC840 IC882 IC380	EH520Z EH20Z ACK300 ACP300	AH725 AH6030 AH130	PR1535	JC8015 JC5015 JC8050 JC5118		PTH30H
		S30		GC2030 GC1040	KC725M KCPM40	MS2050 F40M KCSM40	IC830 IC882 IC928	ACP300 ACM300	AH3135	PR1535	JC8050 JC7560 JC5118		JM4160
		H	H01	MP8010 VP05HT				IC903				JC8003 DH103 JC8008 DH102	
H10	VP15TF VP10H		GC1130 GC1010 GC1030	KC505M KC510M	MH1000 F15M	IC900 IC808 IC907 IC905				JC8003 JC8008 JC8015 JC5118 JC8118P		JP4105 TH303 TH308 PTH08M ATH08M ATH80D	
H20	VP15TF		GC1030 GC1130			F15M	IC900 IC808 IC908 IC380 IC1008		AH3135		JC8015 JC5118 JC8118P		JP4115 TH315
H30						MP3000 F30M	IC380 IC900 IC1008		AH3135				JP4120

Note 1) The tables above are based on published data and not authorized by each manufacturer.

## PCBN

Classification	ISO	Mitsubishi Materials	Sandvik	Seco Tools	Sumitomo Electric	Tungaloy	Kyocera	Dijet	
	Symbol								
Turning	H	H01	BC8105 BC8110 MB8110	CB7105	CBN060K	BNC100 BNX10 BN1000 BNC2010	BXM10 BX310	KBN05M KBN10M KBN510	
		H10	BC8110 MBC020 BC8120 BC8220 MB8025 MB8110 MB8120	CB7115 CB7015	CBN010	BNC160 BNX20 BN2000 BNC2020	BXM10 BX330 BX530	KBN05M KBN25M KBN525	JBN300
		H20	MBC020 BC8120 BC8220 MB8025 MB8120	CB7125 CB7025 CB20	CBN150 CBN160C	BNC200 BNX25 BN250 BNC2020	BXM20 BXA20 BX360	KBN525 KBN05M KBN25M	JBN245
		H30	BC8130 MB8130	CB7135 CB7525	CBN150 CBN160C	BNC300 BN350	BXC50 BX380	KBN35M	
	S	S01	MB730 MB8025		CBN170	BN700 BN7000	M714B		
		S10				BNS8125	BX470, BX480		
		S20							
		S30							
	K	K01	MB710 BC5110 MB5015			BN500 BNC500	BX870 BX930 BX910		
		K10	MB730 MB4020 MB4120	CB7525		BN700 BN7500 BN7000	BX470 BX480	KBN60M	JBN795
		K20	MB730 MB4020 MB4120		CBN200	BN700 BN7000	BX480	KBN60M	JBN500
		K30	BC5030	CB7925	CBN300 CBN400C CBN500	BNS800 BNC8115, BNC8125	BX90S BXC90	KBN900	
	Sintered Alloy		MB4020 MB4120		CBN200	BN7500 BN7000 BNC7115	BX470 BX480	KBN570 KBN70M	

## PCD

Classification	ISO	Mitsubishi Materials	Sandvik	Seco Tools	Sumitomo Electric	Tungaloy	Kyocera	Dijet
	Symbol							
Turning	N	N01	MD205	CD05	PCD05	DA90	DX180 DX160	KPD001 JDA30 JDA735
		N10	MD220	CD10	PCD10	DA150	DX140	KPD010
		N20	MD220		PCD20	DA2200	DX120	JDA715
		N30	MD230 MD2030		PCD30 PCD30M	DA1000	DX110	KPD230 JDA10

Note 1) The tables above are based on published data and not authorized by each manufacturer.

# TECHNICAL DATA

## INSERT CHIPBREAKER COMPARISON TABLE

### NEGATIVE INSERT TYPE

ISO Classification	Cutting Mode	Mitsubishi Materials	Sandvik	Kennametal	Seco Tools	Sumitomo Electric	Tungaloy	Kyocera	Dijet	MOLDINO	Walter	TaeguTec
<b>P</b>	<b>Finish</b>	FH, FP FY, FS	LC	FF	FF1, FF2	FA, FB FL	01* TF, 11 ZF	GP, PP, VF XP, XP-T, XF		FE	FP5	FA FX
	<b>Light</b>	LP SA, SH	XF PF MF	K LF, FN	MF2	SU LU, FE SX, SE	PS NS, 27 TSF, AS, TQ	PQ HQ, CQ	PF UR, UA, UT	BE B, BH, CE	MP3, FV5	FM FG
	<b>Light (Mild Steel)</b>	SY					17	XQ, XS				FC
	<b>Light (With Wiper)</b>	SW	WL, WF	FW	W-FF2 W-MF2	LUW, SEW	FW, SW AFW, ASW	WF WP, WQ			FW5, NF	WS
	<b>Medium</b>	MP MA MH	PM QM, XM XMR	MP, P MN	MF3 MF5, M3 M5	GU UG GE, UX	PM, NM, ZM TA, TM, AM, 28 DM, 33, 37, 38	PG, CJ, GS PS, HS PT	PG UB	CT, AB AH, AR AY, AE	MP5, MV5 MU5	PC, MP, FT MT
	<b>Medium (With Wiper)</b>	MW	WMX, WM WR	MW, RW	W-M6, W-M3 W-MF5	GUW		WE			MW5, NM	WT
	<b>Rough</b>	RP GH Std.	PR, HM Std.	RN, RP	M6, MR6, MR7	MU, MX, ME UZ	TH, THS Std.	PH GT Std.	UD GG	RE Y	RP5, RP7 RV5	RT Std.
	<b>Heavy</b>	HZ HL, HM, HX HV	QR, PR HR, MR	MR, RP RM RH	R4, R5 R57, RR6, R7 R68, RR9	MP HG, HP HU, HW, HF	TRS, 57 TU TUS, 65	PX	UC	HX HE, H	NRF HU5 NRR	RX, RH HD, HY, HT HZ, EH
<b>M</b>	<b>Finish Light</b>	SH, LM	XF, MF	FF, FP LF*	FF1, FF2 MF1	SU, EF	SS	MQ, SK*		MP, AB, BH	FM5	SF
	<b>Medium</b>	MS, GM MM, MA ES	MM QM, XM K	MS, MP UP	MF3 MF4 MF5, M3	EX, EG, UP GU HM	SA, SF SM S	MS, MU TK ST	SF, SZ SG	PV, DE, SE AH	MM5, RM5 MU5	ML EM, MM VF
	<b>Heavy</b>	GH, RM HL, HZ	MR MR	MR, RP	M5, M6, R6 R56, RR6, R7 R8, PR9	EM, MU MP	TH, SH		AE		HU5	
<b>K</b>	<b>Finish Light</b>	LK, MA	KF	FN	MF2 M3, M4		CF	KQ		VA, AH	MK5	FG
	<b>Medium</b>	MK, GK Std.	KM	RP, UN	M5	UZ, GZ, UX	CM Std.	KG, Std., C	PG	V, AE	RK5, MV7	MC
	<b>Rough</b>	RK	KR, KRR		MR7			KH, GC, PH	GG	RE	RK7 RV7	KT
	<b>Heavy</b>	Flat top		Flat top	MR9 Flat top	Flat top	CH, Flat top	ZS, Flat top	Flat top	Flat top	Flat top	
<b>S</b>	<b>Finish</b>	FJ*	SF	FS*, FF	MF1	EF		MQ, SK*			FM5	FA
	<b>Light</b>	LS, MJ, MJ*	SGF*	LF*, MS, FN	MF3	SU*	HRF				NFT MS3	EA, SF
	<b>Medium</b>	MS MA	NGP*, SM QM	UP, P, NGP*	M1 M3	EG, EX, UP	HRM, 28 SA, HMM	SQ MS, MU, TK		VI	NMS, NMT MU5	
	<b>Heavy</b>	RS, GJ	SR, SMR	RP	MR3 MR4	MU		SG, SX			NRS, NRT HU5	ET

\*Peripheral ground type insert.

Note 1) The tables above are based on published data and not authorized by each manufacturer.

## 7° POSITIVE INSERT TYPE

ISO Classification	Cutting Mode	Mitsubishi Materials	Sandvik	Kennametal	Seco Tools	Sumitomo Electric	Tungaloy	Kyocera	Dijet	MOLDINO	Walter	TaeguTec
P	Finish	SMG*	UM*	LF*		FC*, SC*	JS*, 01*	CF*, CK* GQ*, GF* SKS*, SK*			FP2*	SA*
	Finish Light	FP, FV LP, SV	PF, UF	UF, 11 LF, FP	FF1 F1, MF2	FB, FP, LU LB, SU	PF, PSF PS, PSS, TSF	GP, PP, VF XP		JQ	PF4, FP4	FA, FX FG
	Light (With Wiper)	SW	WF	FW	W-F1	LUW, SDW		WP			PF	
	Medium	MV MP, Std.	PM, UM PR, UR	MF, MP	M3 F2, M5	GU MU	TM, 23 PM, 24	HQ, MF* XQ, GK	FT	JE	FP6, MP4 RP4	PC MT
	Medium (With Wiper)	MW	WM	MW	W-MF2 W-M3		SW				PM	WT
M	Finish Light	FM LM	MF, UF	LF, UF FP	F1, F2 MF2	FC*, SI* LU LB, SU	PF, PSF PS, PSS	CF*, CK* GQ*, GF* MQ*, SK*		MP	FM2* FM4	FA FG
	Medium	MM, Std.	MM, UM MR, UR	MP	M3 M5	GU, MU	PM	HQ, GK			FM6 MM4, RM4	PC MT
K	Medium	MK, Std. Flat top	KF, KM, UM, KR	Flat top	F1, M3, M5	MU, Flat top*	Flat top, CM	Flat top*			FK6, MK4 RK4, RK6	MT
N	Medium	AZ*	AL*	HP*	AL*	AG* AW*	AL*	AP* AH*	ASF*, ALU* ACB*		FN2*, PM2* MN2*	FL*
S	Finish Light	FS*, LS* FS-P*, LS-P* FJ* LS, MS	UM* UF, MF UM, MM	LF* HP*		SI* GU	Std.	CF*, CK* GQ*, GF* SK*, MQ			FM2* FM4, FM6 MM4, RM4	SA*, FA, FG PC, MT

\*Peripheral ground type insert.

Note 1) The tables above are based on published data and not authorized by each manufacturer.

## 11° POSITIVE INSERT TYPE

ISO Classification	Cutting Mode	Mitsubishi Materials	Sandvik	Kennametal	Seco Tools	Sumitomo Electric	Tungaloy	Kyocera	Dijet	MOLDINO	Walter	TaeguTec
P	Finish Light	FV, SMG* SV	PF	UF, FP FW, LF		SI, FK, FB LU, LUW, LB SU, SF	01* PF, PSF PS, PSS, TSF	PP, GP, GF* SKS*CF*CK* PF*, XP		JQ	FP4	FG PC
	Medium	MV	PM, UM	MF MP, MW		GU, MU, US	PM TM, 23 24	HQ XQ	BM	JE	MP4	
M	Finish Light	SMG* SV	MF	HP* LF		SU	SS* PF, PS	GF*, CK* PF*, GP, CF* SKS*		MP	FM4	PC
	Medium	MV	MM			GU, MU, US	PM, Std.	HQ			MM4	

\*Peripheral ground type insert.

Note 1) The tables above are based on published data and not authorized by each manufacturer.

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TECHNICAL DATA

# Memo

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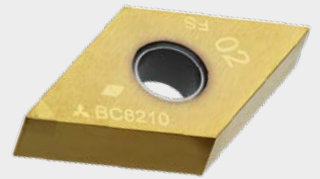
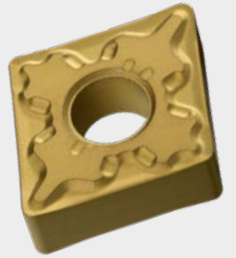
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DDJNR/L	DOUBLE CLAMP holder	C010	E	Stop ring	C019–C021
DDJNR/L	DOUBLE CLAMP holder	C010	EGS	Clamp screw	N004
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DNGG	Insert (Class G tolerance)	A105	FC400890T	Clamp screw	N004
DNGG	Insert (Class G tolerance)	A109	FSCLC1008R/L-06A	DIMPLE BAR	E007
DNGM	Insert (Class G tolerance)	A107	FSCLC1008R/L-06E	DIMPLE BAR (Carbide shank)	E008
DNGN	Insert (Class G tolerance)	B049	FSCLC1008R-06E	DIMPLE BAR (Carbide shank)	E008
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DNMG	Insert (Class M tolerance)	A105	FSCLP	DIMPLE BAR (Carbide shank)	E007
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FSTUP	DIMPLE BAR (Carbide shank)	E009	GYM	Modular blade	F062–F066, F078
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FSVJC	DIMPLE BAR	E014	GYPR/L	Mono block blade	F030
FSVPB	DIMPLE BAR	E013	GYQR/L	Mono block blade	F018
FSVPC	DIMPLE BAR	E013	GYQR/L	Mono block blade	F022
FSVUB	DIMPLE BAR	E013	GYQR/L	Mono block blade	F024
FSVUC	DIMPLE BAR	E013	GYQR/L	Mono block blade	F026
FSWL	FSWL type boring bar	E029	GYQR/L	Mono block blade	F028
FSWUB	DIMPLE BAR	E012	GY05016S	Clamp screw	N004
FSWUB	DIMPLE BAR (Carbide shank)	E012	GY06013M	Clamp screw	N004
FSWUB	DIMPLE BAR (Carbide shank)	E012	GY1B	Insert (For GY holder)	F015
FSWUP	DIMPLE BAR (Carbide shank)	E012	GY1G	Insert (For GY holder)	B063, F013
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GT	Insert for external grooving	D018	GY2M	Insert (For GY holder)	F012
GT	Insert for external grooving	D019	GY2M	Insert (For GY holder)	F012
GY2M	Insert (For GY holder)	F012	GY2M	Insert (For GY holder)	F012
GW	GW holder	F118	GY2M	Insert (For GY holder)	F014
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GYAR/L	GY boring bar	F084	GY2M	Insert (For GY holder)	F014
GYAR/L	GY boring bar	F086	GY2M	Insert (For GY holder)	F014
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			HFF06015	Clamp screw	N004
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MTKR/L	Clamp bridge	N016	NS	Clamp screw	N006
MTQNR/L	WP holder	C018	<b>P</b>		
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NP-CCGW	Insert (Class G tolerance)	B052	PCBNR/L	LL holder	C009
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NP-CNGA	Insert (Class G tolerance)	B036	PRGCR/L	LL holder	C026
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NP-TCGW	Insert (Class G tolerance)	B056	P		
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NP-TNGA	Insert (Class G tolerance)	B044	P		
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			RBH	Round type holder (For MICRO-DEX/ MICROMINI type boring bar)	F129
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VBMT○○○○○○○-LP	Insert (Class M tolerance)	A164	VNMG○○○○○○○-MJ	Insert (Class M tolerance)	A127
VBMT○○○○○○○-LS	Insert (Class M tolerance)	A165	VNMG○○○○○○○-MK	Insert (Class M tolerance)	A127
VBMT○○○○○○○-MK	Insert (Class M tolerance)	A165	VNMG○○○○○○○-MP	Insert (Class M tolerance)	A127
VBMT○○○○○○○-MM	Insert (Class M tolerance)	A165	VNMG○○○○○○○-MS	Insert (Class M tolerance)	A128
VBMT○○○○○○○-MP	Insert (Class M tolerance)	A165	VNMG○○○○○○○-SA	Insert (Class M tolerance)	A127
VBMT○○○○○○○-MS	Insert (Class M tolerance)	A165	VNMG○○○○○○○-SH	Insert (Class M tolerance)	A127
VBMT○○○○○○○-MV	Insert (Class M tolerance)	A165	VNMG160408-MM	Insert (Class M tolerance)	A127
VBMT○○○○○○○-SV	Insert (Class M tolerance)	A165	VPET○○○○○○○-SRF	Insert (Class E tolerance)	A171
VBMW160408	Insert (Class M tolerance)	A166	VPGT○○○○○○○M-SMG	Insert (Class G tolerance)	A171
VCGT○○○○○○○-AZ	Insert (Class G tolerance)	A167	<b>W</b>		
VCGT○○○○○○○M-LS	Insert (Class G tolerance)	A168	WBGD○○○○○○○R/L-F	Insert (Class G tolerance)	A172
VCGT○○○○○○○M-LS-P	Insert (Class G tolerance)	A168	WBMT○○○○○○○R/L-MV	Insert (Class M tolerance)	A172
VCGT○○○○○○○R/L-F	Insert (Class G tolerance)	A167	WCGT○○○○○○○R/L	Insert (Class G tolerance)	A173
VCGW1103○○	Insert (Class G tolerance)	B071	WCMT○○○○○○○	Insert (Class M tolerance)	A173
VCMT○○○○○○○	Insert (Class M tolerance)	A169	WCMW06T304	Insert (Class M tolerance)	B072
VCMT○○○○○○○-FM	Insert (Class M tolerance)	A167	WCS○○○○○○○H	Shim screw	N008
VCMT○○○○○○○-FP	Insert (Class M tolerance)	A167	WNMA○○○○○○○	Insert (Class M tolerance)	A134
VCMT○○○○○○○-FV	Insert (Class M tolerance)	A167	WNMG○○○○○○○	Insert (Class M tolerance)	A133
VCMT○○○○○○○-LM	Insert (Class M tolerance)	A167	WNMG○○○○○○○-FH	Insert (Class M tolerance)	A130
VCMT○○○○○○○-LP	Insert (Class M tolerance)	A167	WNMG○○○○○○○-FP	Insert (Class M tolerance)	A130
VCMT○○○○○○○-LS	Insert (Class M tolerance)	A168	WNMG○○○○○○○-FS	Insert (Class M tolerance)	A130
VCMT○○○○○○○-MK	Insert (Class M tolerance)	A169	WNMG○○○○○○○-FY	Insert (Class M tolerance)	A130
VCMT○○○○○○○-MM	Insert (Class M tolerance)	A168	WNMG○○○○○○○-GH	Insert (Class M tolerance)	A134
VCMT○○○○○○○-MP	Insert (Class M tolerance)	A168	WNMG○○○○○○○-GJ	Insert (Class M tolerance)	A134
VCMT○○○○○○○-MS	Insert (Class M tolerance)	A169	WNMG○○○○○○○-GK	Insert (Class M tolerance)	A133
			WNMG○○○○○○○-GM	Insert (Class M tolerance)	A133

Order Number	PRODUCT NAME	Page	Order Number	PRODUCT NAME	Page
WNUMG○○○○○○○-LK	.....Insert (Class M tolerance)	A131			
WNUMG○○○○○○○-LM	.....Insert (Class M tolerance)	A130			
WNUMG○○○○○○○-LP	.....Insert (Class M tolerance)	A130			
WNUMG○○○○○○○-LS	.....Insert (Class M tolerance)	A131			
WNUMG○○○○○○○-MA	.....Insert (Class M tolerance)	A133			
WNUMG○○○○○○○-MH	.....Insert (Class M tolerance)	A133			
WNUMG○○○○○○○-MJ	.....Insert (Class M tolerance)	A131			
WNUMG○○○○○○○-MK	.....Insert (Class M tolerance)	A132			
WNUMG○○○○○○○-MM	.....Insert (Class M tolerance)	A132			
WNUMG○○○○○○○-MP	.....Insert (Class M tolerance)	A132			
WNUMG○○○○○○○-MS	.....Insert (Class M tolerance)	A132			
WNUMG○○○○○○○-MW	.....Insert (Class M tolerance)	A133			
WNUMG○○○○○○○-RK	.....Insert (Class M tolerance)	A134			
WNUMG○○○○○○○-RM	.....Insert (Class M tolerance)	A133			
WNUMG○○○○○○○-RP	.....Insert (Class M tolerance)	A133			
WNUMG○○○○○○○-RS	.....Insert (Class M tolerance)	A134			
WNUMG○○○○○○○-SA	.....Insert (Class M tolerance)	A131			
WNUMG○○○○○○○-SH	.....Insert (Class M tolerance)	A131			
WNUMG○○○○○○○-SW	.....Insert (Class M tolerance)	A131			
WNUMG○○○○○○○-SY	.....Insert (Class M tolerance)	A131			
WPGT○○○○○○○	.....Insert (Class G tolerance)	B072			
WPGT○○○○○○○R/L-FS	.....Insert (Class G tolerance)	A174			
WPMT○○○○○○○-MV	.....Insert (Class M tolerance)	A174			
WPSTN○○○	.....Shim	N013			
WPSWC43	.....Shim	N013			
WPSWN43	.....Shim	N013			
WS○○○○○○○T	.....Clamp screw	N008			
WS○○○○○○○TPS	.....Clamp screw	N008			
<b>X</b>					
XCMT○○○○○○○-SVX	.....Insert (Class M tolerance)	A175			



# WORLDWIDE



## **MITSUBISHI MATERIALS CORPORATION - METALWORKING SOLUTIONS COMPANY A SYNERGY FOR SUCCESS**

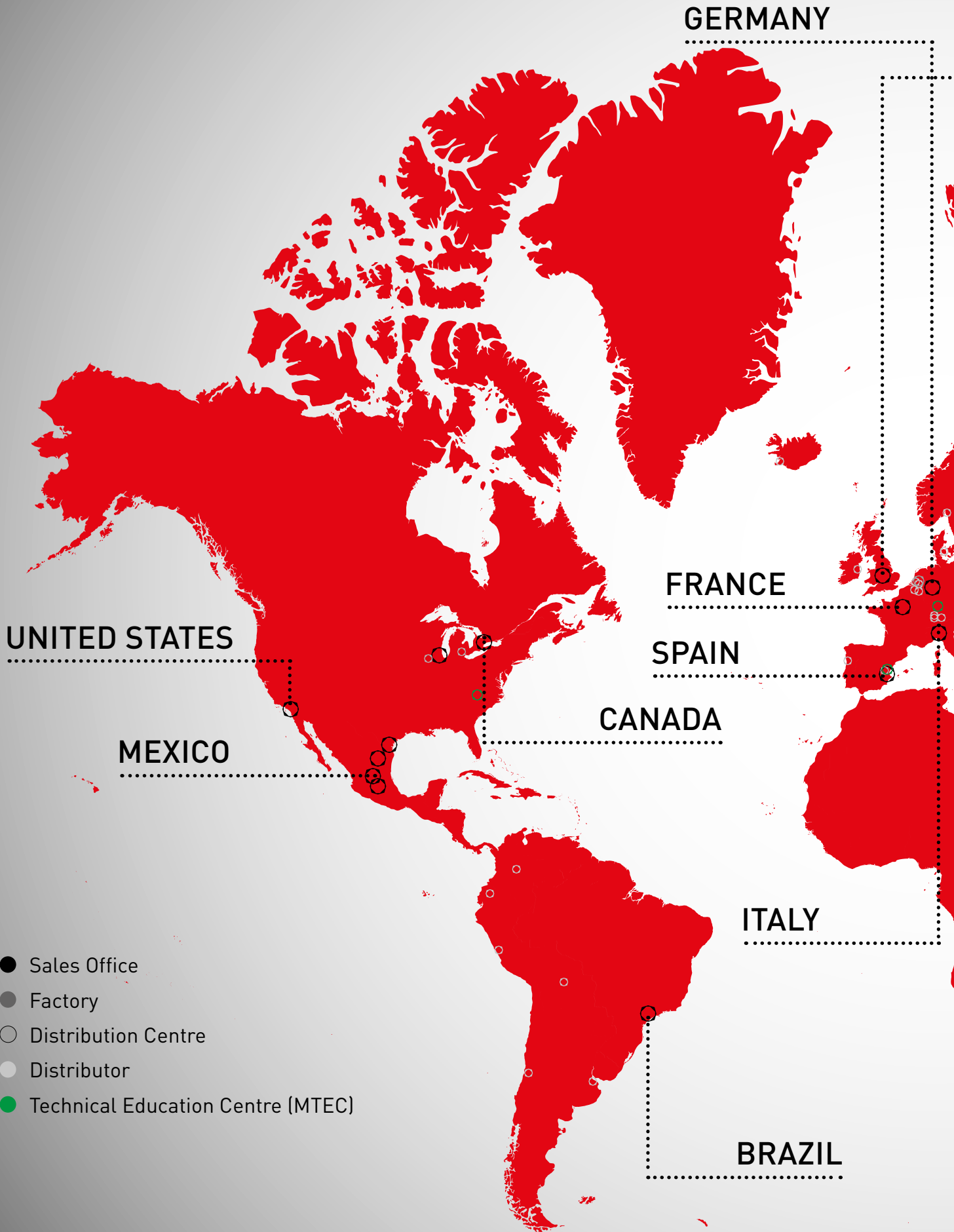
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The company's global market presence, with headquarters and sales offices in Japan, Europe, India, Brazil, China, Thailand, Mexico and the US, as well as a broad network of international distributors, ensures a targeted, comprehensive service.

Information exchange and technology transfer, open communication and growing synergies guarantee maximum performance and sustainable customer success.

# METALWORKING SOLUTIONS COMPANY

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# MITSUBISHI MATERIALS CORPORATION

## GERMANY

MMC HARTMETALL GMBH  
Comeniusstr. 2 . 40670 Meerbusch  
Phone +49 2159 91890 . Fax +49 2159 918966  
Email admin@mmchg.de

## U.K.

MMC HARDMETAL U.K. LTD.  
Mitsubishi House . Galena Close . Tamworth . Staffs. B77 4AS  
Phone +44 1827 312312 . Fax +44 1827 312314  
Email sales@mitsubishicarbide.co.uk

## SPAIN

MITSUBISHI MATERIALS ESPAÑA, S.A.  
Calle Emperador 2 . 46136 Museros/Valencia  
Phone +34 96 1441711 . Fax +34 96 1443786  
Email comercial@mmevalencia.es

## FRANCE

MMC METAL FRANCE S.A.R.L.  
6, Rue Jacques Monod . 91400 Orsay  
Phone +33 1 69 35 53 53 . Fax +33 1 69 35 53 50  
Email mmfsales@mmc-metal-france.fr

## POLAND

MMC HARDMETAL POLAND SP. Z O.O  
Al. Armii Krajowej 61 . 50 - 541 Wrocław  
Phone +48 71335 1620 . Fax +48 71335 1621  
Email sales@mitsubishicarbide.com.pl

## RUSSIA

MMC HARDMETAL OOO LTD.  
Electrozavodskaya St. 24 . build. 3 . Moscow . 107023  
Phone +7 495 725 58 85 . Fax +7 495 981 39 79  
Email info@mmc-carbide.ru

## ITALY

MMC ITALIA S.R.L.  
Viale Certosa 144 . 20156 Milano  
Phone +39 0293 77031 . Fax +39 0293 589093  
Email info@mmc-italia.it

## TURKEY

MMC HARTMETALL GMBH ALMANYA - İZMİR MERKEZ ŞUBESİ  
Adalet Mahallesi Anadolu Caddesi No: 41-1 . 15001 35530 Bayraklı/İzmir  
Phone +90 232 5015000 . Fax +90 232 5015007  
Email info@mmchg.com.tr

[www.mitsubishicarbide.com](http://www.mitsubishicarbide.com) | [www.mmc-hardmetal.com](http://www.mmc-hardmetal.com)