reich®
ADVANCED TECHNOLOGY TOOLS
Wir verändern.

Tooling by DIJET®

INDEXABLE TOOLS

2026~2027

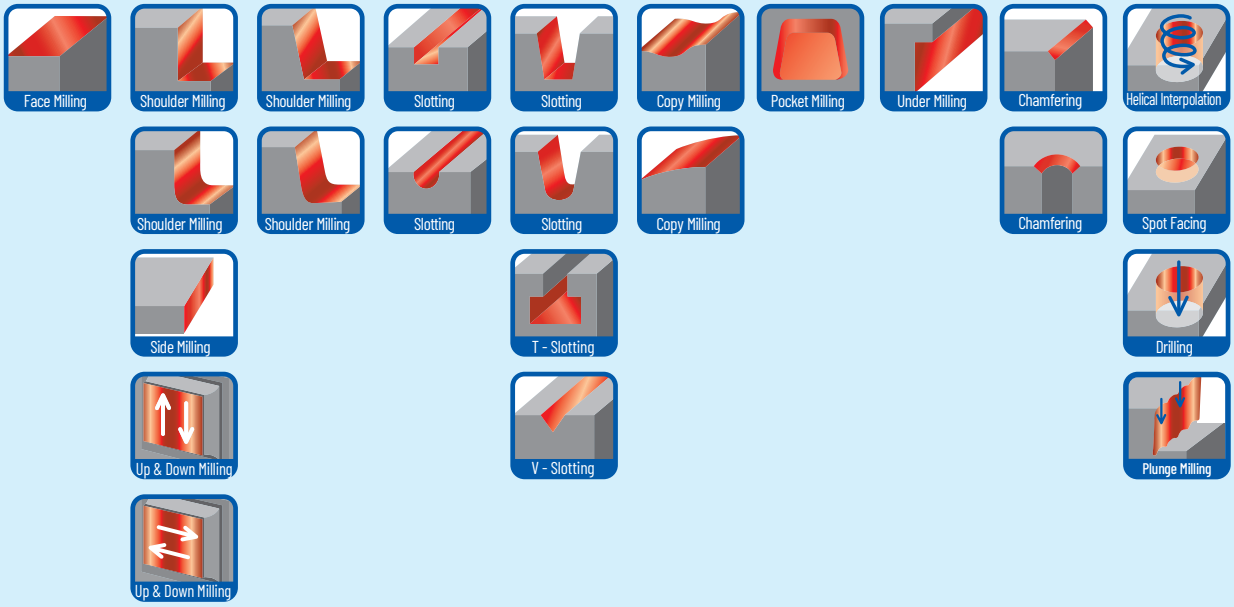
ABOUT DIJET CATALOG

- All cutter-holders are supplied without Inserts , Wrench & MOLY.
- Specifications for the products listed in this catalog are subject to change without notice due to replacement or modification.

ABOUT STOCK

●: Stocked Items ○: Stock in JAPAN ◎: Soon to be stocked ∗: To be discontinued

CUTTING STYLE ICON



COATING ICON

DIA Coating | CBN | DLC | DH Coating | DV Coating

JC7500 Coating | DZ TiAlN | TiAlN | DX TiCN | JC TiN

TYPE OF MACHINING

Roughing | Semi-finishing | Finishing

OTHERS

G - Body

G-BODY is a GN surface-hardening treatment on thermal resistant high strength steel giving a hardness over 65HRC and secures insert pocket and holder against thermal deformation improving body durability.

C - Body

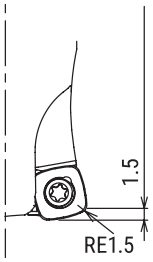
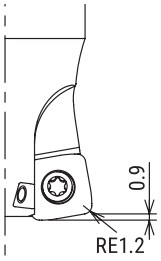
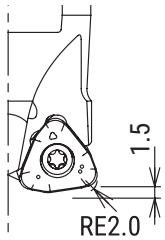
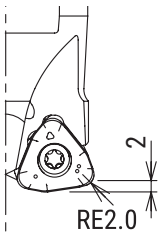
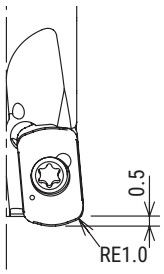
Carbide shank provides much lower deflection than steel shank, that enables maximum tool life and highest productivity.

SAFETY DATA SHEET

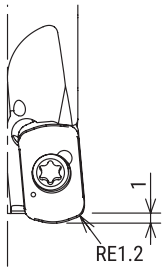
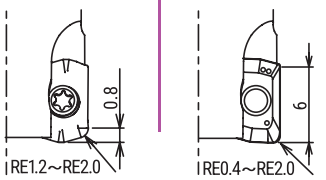
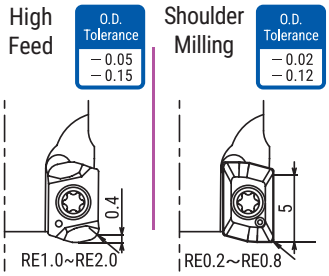
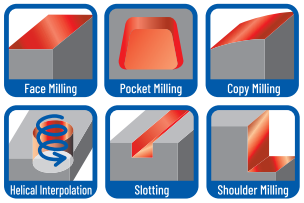
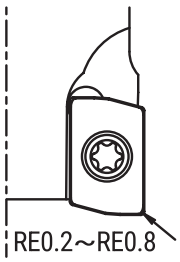
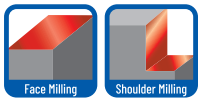
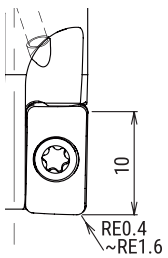
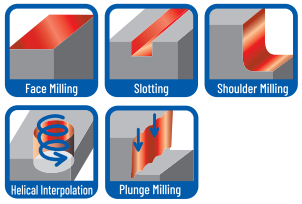
INDEXABLE TOOLS



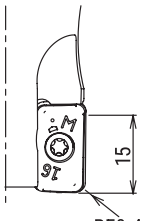
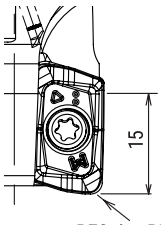
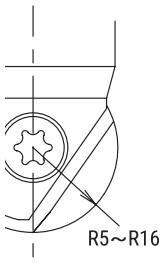
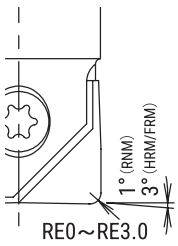
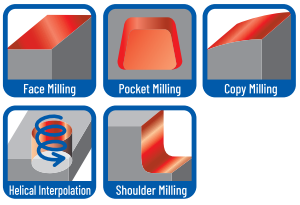
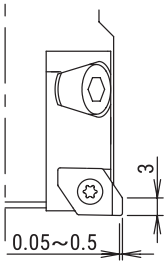
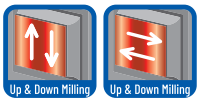
MILLING TOOLS QUICK GUIDE | Modular Head Type

Type	Item Code	Shape / Tool dia.	Cutting edge angle / Max.DOC	Applications	
HIGH FEED COPY MILLING	SKS-GII MSG Type A043	O.D. Tolerance 0 −0.1 / Insert N,E,M Class  Ø25–42			
HIGH FEED COPY MILLING	SKS-GII-09 MSG-09 Type A054	O.D. Tolerance 0 −0.1 / Insert E Class  Ø20–42			
HIGH FEED COPY MILLING	SKS EXTREME MEX-05 Type A062	O.D. Tolerance −0.05 −0.15 / Insert M Class  Ø20–40			
HIGH FEED COPY MILLING	SKS EXTREME MEX-07 Type A064	O.D. Tolerance −0.05 −0.15 / Insert M Class  Ø32–42			
HIGH FEED COPY MILLING	QM GII MXG-07 Type A075	Insert M Class  Ø10–16			

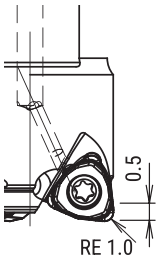
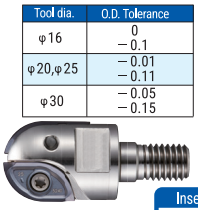
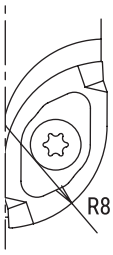
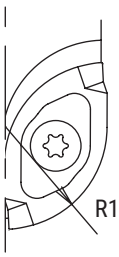
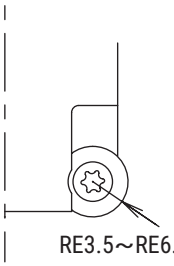
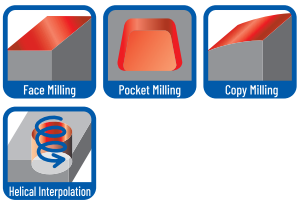
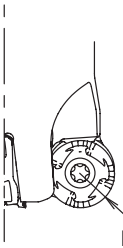
MILLING TOOLS QUICK GUIDE | Modular Head Type

Type	Item Code	Shape / Tool dia.	Cutting edge angle / Max.DOC	Applications	
HIGH FEED COPY MILLING	QM MAX GII MXG Type A083	Insert M Class  Ø16–42			
HIGH FEED COPY MILLING	QM MAX MQX Type A094	Insert H,M Class  Ø16–42	High Feed O.D. Tolerance −0.06 −0.14 Shoulder Milling O.D. Tolerance −0.03 −0.11 		
HIGH FEED COPY MILLING	QM MILL MPM Type A108	Insert H,M Class  Ø10–32	High Feed O.D. Tolerance −0.05 −0.15 Shoulder Milling O.D. Tolerance −0.02 −0.12 		
SHOULDER MILLING	HIGH PRECISION QM MILL MPT Type A108	O.D. Tolerance 0 −0.03 Insert H,M Class  Ø10–16			
SHOULDER MILLING	EXTREME SAP MSX-11 Type A118	O.D. Tolerance −0.04 −0.1 Insert G Class  Ø16–40			

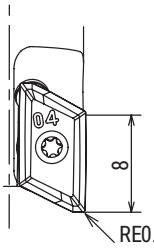
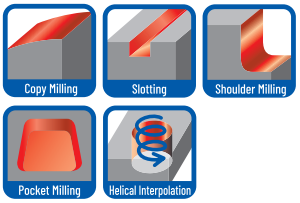
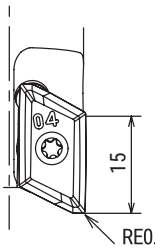
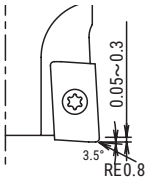
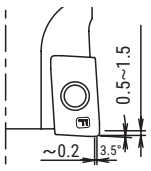
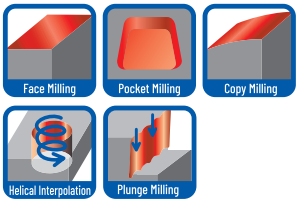
MILLING TOOLS QUICK GUIDE | Modular Head Type

Type	Item Code	Shape / Tool dia.	Cutting edge angle / Max.DOC	Applications	
SHOULDER MILLING	EXTREME SAP MSX-17 Type A122	O.D. Tolerance −0.05 −0.15 Insert G Class  Ø25–40			
SHOULDER MILLING	SIC-EVO SSV Type A136	O.D. Tolerance −0.05 −0.15 Insert E, M Class  Ø25–40			
FINISHING COPY MILLING	MIRROR BALL MBX Type A145	O.D. Tolerance ±0.008 Insert F Class  Ø10–30			
FINISHING COPY MILLING	MIRROR RADIUS MRX Type A155	O.D. Tolerance −0.002 −0.018 Insert F Class  Ø10–32			
FINISHING UP & DOWN MILLING	BACK & FORTH CUTTER MPF Type Available only on WEB CATALOGUE	O.D. Tolerance +0.1 −0.3 Insert G Class  Ø30–40			WEB CATALOGUE

MILLING TOOLS QUICK GUIDE | Modular Head Type

Type	Item Code	Shape / Tool dia.	Cutting edge angle / Max.DOC	Applications	
FINISHING COPY MILLING	DIEMASTER 5G MXF Type A169	O.D. Tolerance 0.0 / −0.05, Insert H Class  Ø16–42	 RE 1.0		
ROUGHING COPY MILLIG	SWING BALL MSWX Type Available only on WEB CATALOGUE	 Insert G Class Ø16–30	 R8～R15		WEB CATALOGUE
ROUGHING COPY MILLING	SWING BALL MSW Type Available only on WEB CATALOGUE	O.D. Tolerance −0.05 / −0.15, Insert G Class  Ø32	 R16	 G-Body	WEB CATALOGUE
COPY MILLING	SUPER DIEMASTER SDH Type A175	O.D. Tolerance 0 / −0.1, Insert G,M Class  Ø15–42	 RE3.5～RE6.0		
COPY MILLING	EXTREME DIEMASTER MTX Type Available only on WEB CATALOGUE	O.D. Tolerance 0 / −0.1, Insert M Class  Ø32–40	 RE6.0		WEB CATALOGUE

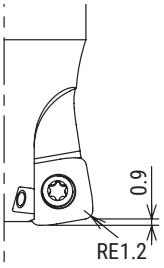
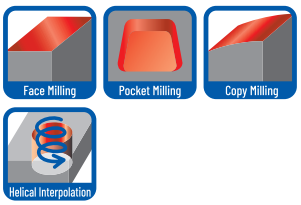
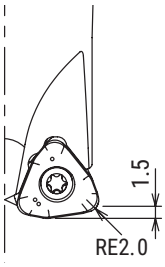
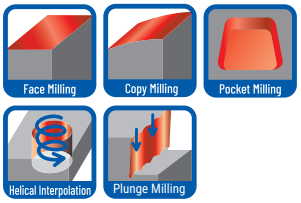
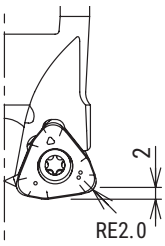
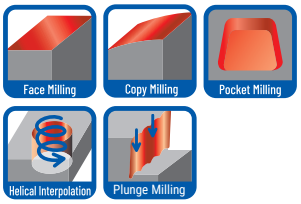
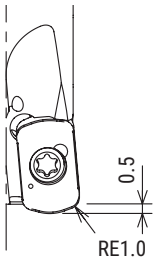
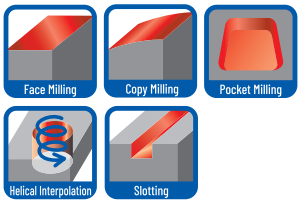
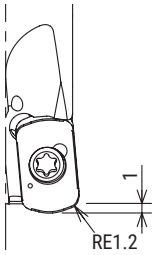
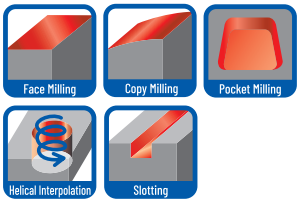
MILLING TOOLS QUICK GUIDE | Modular Head Type

Type	Item Code	Shape / Tool dia.	Cutting edge angle / Max.DOC	Applications	
FOR ALUMINIUM ALLOY	AERO CHIPPER MAM Type A193	O.D. Tolerance 0 −0.1 / Insert E Class  Ø16–42			
FOR ALUMINIUM ALLOY	AERO CHIPPER MAL Type A194	O.D. Tolerance −0.04 −0.1 / Insert G Class  Ø20–40			
FINISHING SIDE & BOTTOM FACE	BACK DRAFT CUTTER MDB Type Available only on WEB CATALOGUE	O.D. Tolerance 0 −0.1 / Insert H Class  Ø20–40	Bottom Finishing  Side Finishing 		WEB CATALOGUE

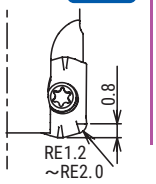
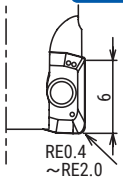
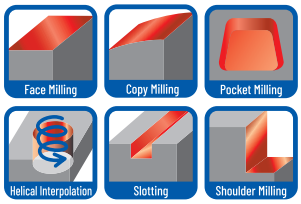
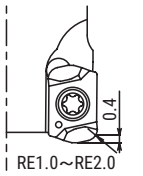
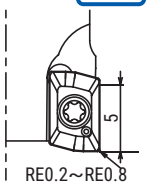
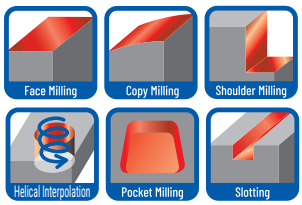
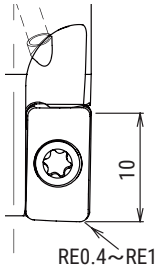
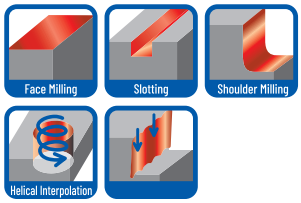
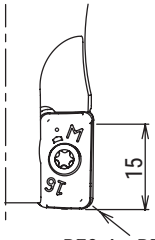
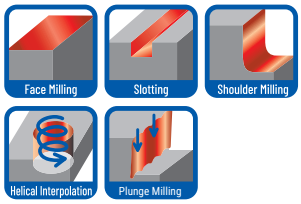
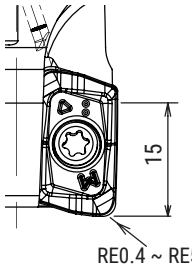
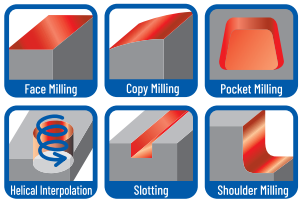
MILLING TOOLS QUICK GUIDE | Modular Head Type

Type	Item Code	Shape / Tool dia.	Cutting edge angle / Max.DOC	Applications	
FOR HIGH EFFICIENCY MACHINING	CARBIDE SHANK	 MSN Type Ø10–32  MSN-S Type Ø9.8–32			
	MSN Type				
	A208				

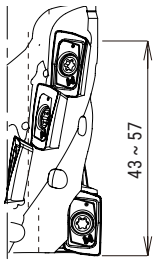
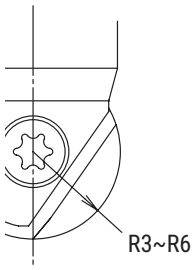
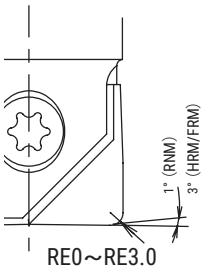
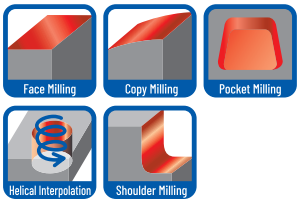
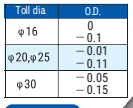
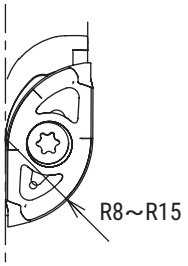
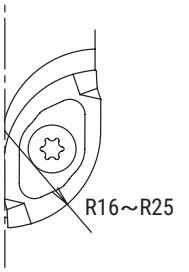
MILLING TOOLS QUICK GUIDE | Shank Type

Type	Item Code	Shape / Tool dia.	Cutting edge angle / Max.DOC	Applications	
HIGH FEED COPY MILLING	SKS-GII-09 SKG-09 Type A055	O.D. Tolerance 0 −0.1 Insert E Class  Ø25–40			
HIGH FEED COPY MILLING	SKS EXTREME EXSKS-05 Type A063	O.D. Tolerance −0.05 −0.15 Insert M Class  Ø20–33			
HIGH FEED COPY MILLING	SKS EXTREME EXSKS-07 Type A065	O.D. Tolerance −0.05 −0.15 Insert M Class  Ø32–40			
HIGH FEED COPY MILLING	QM GII GMX-07 Type A076	O.D. Tolerance −0.05 −0.15 Insert M Class  Ø10–14			
HIGH FEED COPY MILLING	QM MAX GII GMX Type A082	O.D. Tolerance −0.05 −0.15 Insert M Class  Ø16–32			

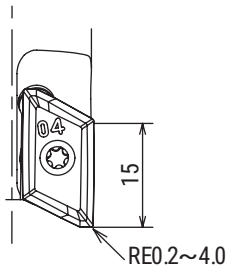
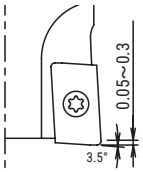
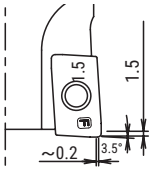
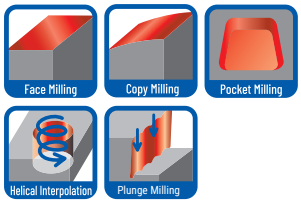
MILLING TOOLS QUICK GUIDE | Shank Type

Type	Item Code	Shape / Tool dia.	Cutting edge angle / Max.DOC	Applications	
HIGH FEED COPY MILLING	QM MAX QXPS Type A093	Insert H, M Class  Ø16–25	High Feed O.D. Tolerance −0.06 −0.14  RE1.2 ~RE2.0 Shoulder Milling O.D. Tolerance −0.03 −0.11  RE0.4 ~RE2.0		
HIGH FEED COPY MILLING	QM MILL PME Type A107	Insert H, M Class  Ø10–14	High Feed O.D. Tolerance −0.05 −0.15  RE1.0~RE2.0 Shoulder Milling O.D. Tolerance −0.02 −0.12  RE0.2~RE0.8		
SHOULDER MILLING	EXTREME SAP EXSAP-11 Type A117	O.D. Tolerance −0.03 −0.11 Insert G Class  Ø16–40	 RE0.4~RE1.6		
SHOULDER MILLING	EXTREME SAP EXSAP-17 Type A121	O.D. Tolerance −0.05 −0.15 Insert G Class  Ø25–40	 RE0.4~RE3.0		
SHOULDER MILLING	SIC-EVO SSV Type A137	O.D. Tolerance −0.05 −0.15 Insert E, M Class  Ø25–40	 RE0.4 ~ RE5.0		

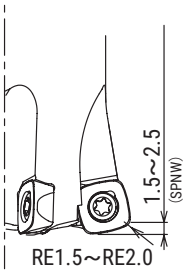
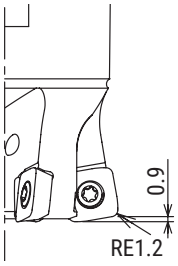
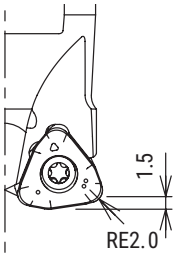
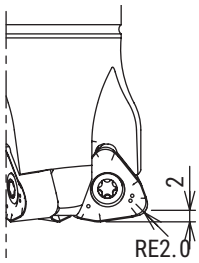
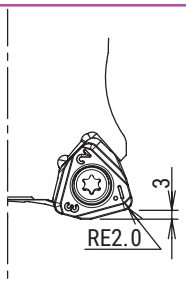
MILLING TOOLS QUICK GUIDE | Shank Type

Type	Item Code	Shape / Tool dia.	Cutting edge angle / Max.DOC	Applications	
SHOULDER MILLING	SIC-EVO SSVL Type A138	Insert M Class  Ø32–40			
FINISHING COPY MILLING	MIRROR BALL BNM Type A144	O.D. Tolerance ±0.008 Insert F Class  Ø6–12			
FINISHING COPY MILLING	MIRROR RADIUS RNM Type A154	O.D. Tolerance −0.002 −0.018 Insert F Class  Ø6–12			
ROUGHING COPY MILLING	SWING BALL SWBX Type Available only on WEB CATALOGUE	 Insert G Class Ø16–30			WEB CATALOGUE
ROUGHING COPY MILLING	SWING BALL SWB Type Available only on WEB CATALOGUE	O.D. Tolerance −0.05 −0.15 Insert G Class  Ø32–50			WEB CATALOGUE

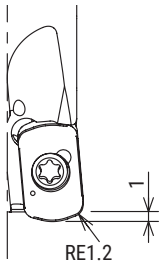
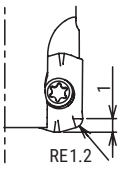
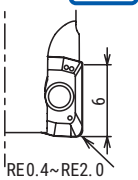
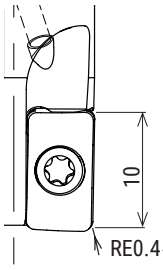
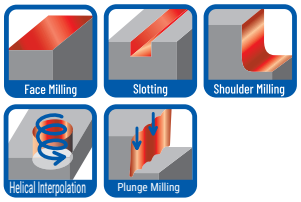
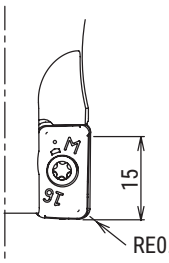
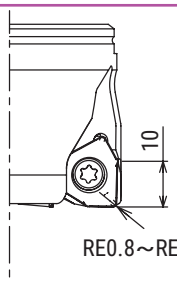
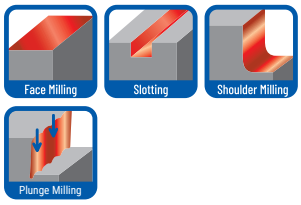
MILLING TOOLS QUICK GUIDE | Shank Type

Type	Item Code	Shape / Tool dia.	Cutting edge angle / Max.DOC	Applications	
FOR ALUMINIUM ALLOY	AERO CHIPPER ALXM Type A195	O.D. Tolerance 0 −0.1 Insert G Class  Ø20–40			
FINISHING SIDE & BOTTOM FACE	BACK DRAFT CUTTER DBD Type Available only on WEB CATALOGUE	O.D. Tolerance 0 −0.1 Insert H Class  Ø40	Bottom Finishing  Side Finishing 		WEB CATALOGUE

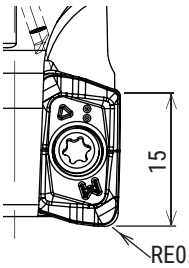
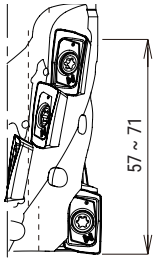
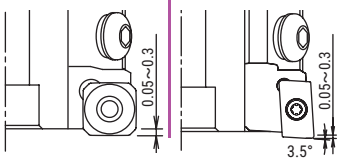
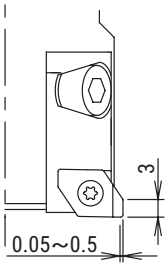
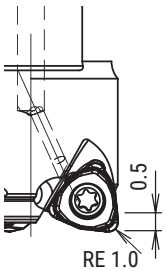
MILLING TOOLS QUICK GUIDE | Bore Type

Type	Item Code	Shape / Tool dia.	Cutting edge angle / Max.DOC	Applications
HIGH FEED COPY MILLING	SKS-II SKG Type A042	O.D. Tolerance −0.05 −0.15 / Insert N,E,M Class  Ø50–100		
HIGH FEED COPY MILLING	SKS-II-09 SKG-09 Type A054	O.D. Tolerance −0.05 −0.15 / Insert E Class  Ø40–80		
HIGH FEED COPY MILLING	SKS EXTREME EXSKS-05 Type A062	O.D. Tolerance −0.05 −0.15 / Insert M Class  Ø40–63		
HIGH FEED COPY MILLING	SKS EXTREME EXSKS-07 Type A064	O.D. Tolerance −0.05 −0.15 / Insert M Class  Ø50–100		
HIGH FEED COPY MILLING	SKS EXTREME EXSKS-09 Type A066	O.D. Tolerance 0 −0.2 / Insert M Class  Ø50–160		

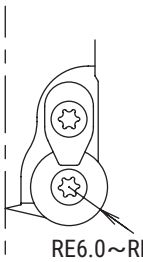
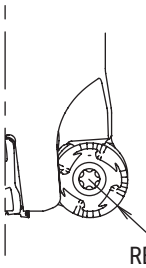
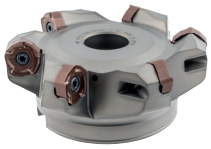
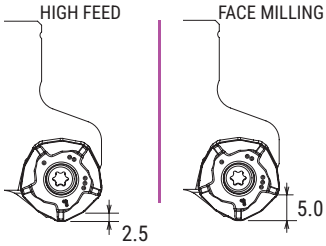
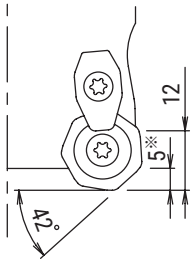
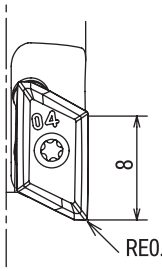
MILLING TOOLS QUICK GUIDE | Bore Type

Type	Item Code	Shape / Tool dia.	Cutting edge angle / Max.DOC	Applications	
HIGH FEED COPY MILLING	QM MAX GII GMX Type A081	O.D. Tolerance −0.05 −0.15 / Insert M Class  Ø40–66			
HIGH FEED COPY MILLING	QM MAX QXP Type A092	Insert H, M Class  Ø40–66	High Feed: O.D. Tolerance −0.05 −0.15  Shoulder Milling: O.D. Tolerance −0.02 −0.12 		
SHOULDER MILLING	EXTREME SAP EXSAP-11 Type A116	Tool dia. / O.D. Tolerance: ≦φ63 −0.03 −0.11; φ80 −0.02 −0.12 / Insert G Class  Ø40–80			
SHOULDER MILLING	EXTREME SAP EXSAP-17 Type A120	Tool dia. / O.D. Tolerance: ≦φ80 −0.05 −0.15; ≧φ100 0 −0.2 / Insert G Class  Ø50–125			
SHOULDER MILLING	SHOULDER 6 EXSIX Type A131	Tool dia. / O.D. Tolerance: ≦φ80 −0.05 −0.15; ≧φ100 0 −0.2 / Insert M Class  Ø50–160			

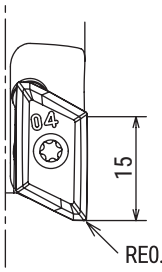
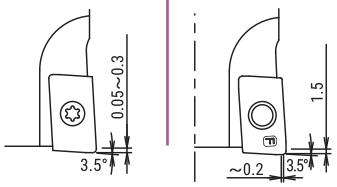
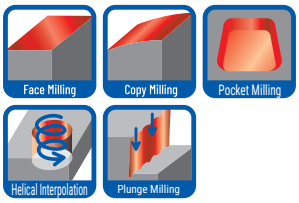
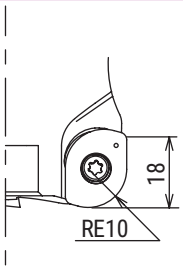
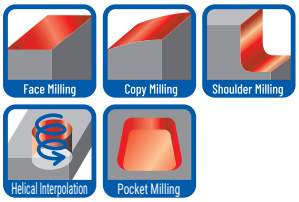
MILLING TOOLS QUICK GUIDE | Bore Type

Type	Item Code	Shape / Tool dia.	Cutting edge angle / Max.DOC	Applications	
SHOULDER MILLING	SIC-EVO SSV Type A136	Tool dia. / O.D. Tolerance ≦φ80 : −0.05 −0.15 ≧φ100 : −0.025 −0.175 Insert E, M Class  Ø40–125	 RE0.4 ~ RE5.0	Copy Milling, Slotting, Shoulder Milling, Pocket Milling, Helical Interpolation, Face Milling	
SHOULDER MILLING	SIC-EVO SSVL Type A138	Insert M Class  Ø50–80		Copy Milling, Slotting, Shoulder Milling, Pocket Milling, Helical Interpolation, Face Milling, G-Body	
SUPER FINISHING FOR FLAT FACE	FINISH JET MILL FJM Type Available only on WEB CATALOGUE	O.D. Tolerance ±0.2 Insert H Class  Ø80–250	Super Finishing / Corner Finishing 	Face Milling	WEB CATALOGUE
FINISHING UP & DOWN MILLING	BACK & FORTH CUTTER PFC Type Available only on WEB CATALOGUE	O.D. Tolerance +0.1 −0.3 Insert G Class  Ø50–80		Up & Down Milling, Up & Down Milling	WEB CATALOGUE
FINISHING COPY MILLING	DIEMASTER 5G XFG Type A168	O.D. Tolerance 0.0 −0.5 Insert H Class  Ø50–66	 RE 1.0	Face Milling, Shoulder Milling, Copy Milling	

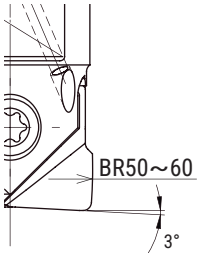
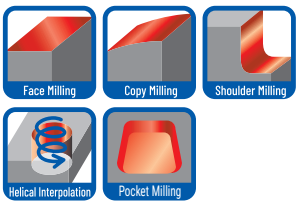
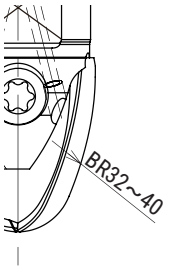
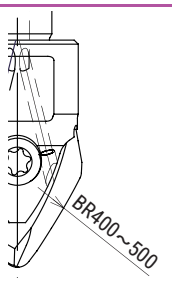
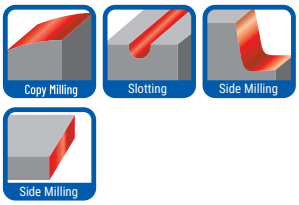
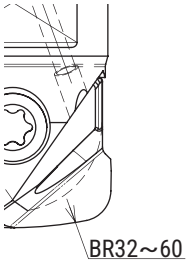
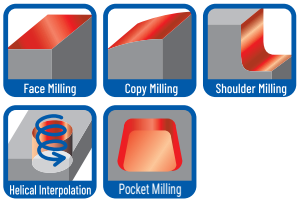
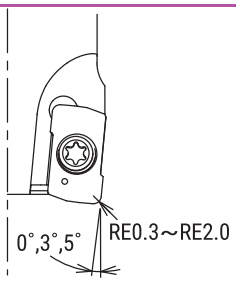
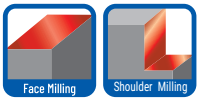
MILLING TOOLS QUICK GUIDE | Bore Type

Type	Item Code	Shape / Tool dia.	Cutting edge angle / Max.DOC	Applications	
COPY MILLING	SUPER DIEMASTER HDM Type A174	O.D. Tolerance 0 −0.2 / Insert G, M Class  Ø50–80	 RE6.0~RE8.0	Face Milling, Pocket Milling, Copy Milling, Helical Interpolation	
COPY MILLING	EXTREME DIEMASTER EXTDM Type Available only on WEB CATALOGUE	O.D. Tolerance 0 −0.2 / Insert M Class  Ø50–63	 RE6.0	Face Milling, Copy Milling, Pocket Milling, Helical Interpolation	WEB CATALOGUE
FOR HEAVY MACHINING	PNS-REBORN PNS Type A182	Insert M Class  Ø50–250	 HIGH FEED 2.5 / FACE MILLING 5.0	Face Milling, G-Body	
FOR HEAVY MACHINING	HEPTA MILL HEP Type A186	O.D. Tolerance −0.025 −0.175 / Insert H, M Class  Ø50–200	 12, 5°, 42°	Face Milling, Copy Milling, Pocket Milling, Helical Interpolation, Plunge Milling, G-Body	
FOR ALMINIUM ALLOY	AERO CHIPPER AMX Type A192	O.D. Tolerance 0 −0.1 / Insert E Class  Ø40–80	 8 RE0.4~RE2.0	Copy Milling, Slotting, Shoulder Milling, Helical Interpolation, Plunge Milling, G-Body	

MILLING TOOLS QUICK GUIDE | Bore Type

Type	Item Code	Shape / Tool dia.	Cutting edge angle / Max.DOC	Applications	
FOR ALMINIUM ALLOY	AERO CHIPPER ALX Type A194	O.D. Tolerance 0 −0.1 / Insert G Class  Ø50–63			
FINISHING SIDE & BOTTOM FACE	BACK DRAFT CUTTER DBD Type Available only on WEB CATALOGUE	O.D. Tolerance 0 −0.1 / Insert H Class  Ø50–80			WEB CATALOGUE
ROUGHING COPY MILLING	RADIUS MILL WDR Type Available only on WEB CATALOGUE	O.D. Tolerance −0.05 −0.15 / Insert M Class  Ø50–63			WEB CATALOGUE

MILLING TOOLS QUICK GUIDE | 5–AXIS Series

Type	Item Code	Shape / Tool dia.	Barrel R	Applications	
5 - AXIS	MIRROR BARREL KRM Type A027	O.D. Tolerance −0.002 −0.018 Insert F Class  Ø16–30			
5 - AXIS	MIRROR BARREL TNM Type A028	O.D. Tolerance ±0.008 Insert F Class  Ø16–20			
5 - AXIS	MIRROR BARREL TPM Type A029	O.D. Tolerance ±0.008 Insert F Class  Ø16–20			
5 - AXIS	MIRROR BARREL LRM Type A030	O.D. Tolerance ±0.008 Insert F Class  Ø16–30			
5 - AXIS	HIGH PRECISION QM MAX MQT Type A032	O.D. Tolerance 0 −0.03 Insert H, M Class  Ø16–35			

DESIGNATION SYSTEM FOR MILLING INSERT

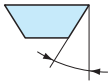
S	P	M	T	10
1	2	3	4	5
Shape	Relief angle	Accuracy	Groove and Hole	Cutting edge length

1 Shape

Symbol	Shape	Nose angle	Figure
H	Hexagonal	120°	
O	Octagonal	135°	
P	Pentagonal	108°	
S	Square	90°	
T	Triangular	60°	
C	Rhombic	80°	
D		55°	
E		75°	
M		86°	
V		35°	
L	Rectangular	90°	
A	Parallelogram	85°	
R	Round	–	
W	Special design	others	
X			
Y			
Z			

2 Relief angle

Symbol	Relief angle
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	others



3 Accuracy

Tolerance (mm)

Symbol	Corner height	Thickness	I.C. dia.
C	±0.013	±0.025	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.13	±0.025
H	±0.013	±0.025	±0.013
K	±0.013	±0.025	±0.05~±0.13
L	±0.025	±0.025	±0.05~±0.13
M	±0.08~±0.18	±0.13	±0.05~±0.13
N	±0.08~±0.18	±0.025	±0.05~±0.13
U	±0.13~±0.38	±0.13	±0.08~±0.25

Inscribed circle	Tolerance on I.C. dia. K,L, M (class)	Tolerance on corner height M (class)
6.35	±0.05	±0.08
9.525		
12.7	±0.08	±0.13
15.875	±0.1	±0.15
19.05		

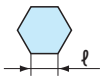
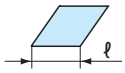
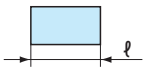
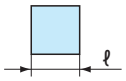
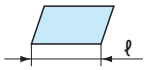
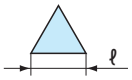
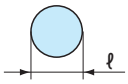
4 Groove

Symbol	Shape
N	
R	
F	
W	40~60° 40~60°
T	40~60° 40~60°
Q	40~60°

Symbol	Shape
U	40~60°
B	70~90° 70~90°
H	70~90° 70~90°
C	70~90°
J	70~90°
X	others

04	15	ZP	E	R	-	S	M
⑥	⑦	⑦ ⑧	⑨	⑩		⑪	⑫
Insert thickness	Corner configuration	Corner configuration / Corner angle	Cutting edge condition	Feed direction		Classification Ⅰ	Classification Ⅱ

⑤ Cutting edge length

Symbol	length (ℓ)	Symbol	length (ℓ)
H		C M D V E	
O		L	
S		A	
T		R	

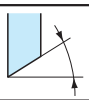
⑥ Thickness

Symbol	Thickness (mm)
02	2.38
T2	2.78
03	3.18
T3	3.97
04	4.76
05	5.56
06	6.35
07	7.94
09	9.52

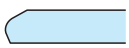
⑦ Corner configuration

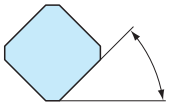
Symbol	Corner radius (mm)
02	0.2
04	0.4
08	0.8
12	1.2
15	1.5
16	1.6
20	2.0
25	2.5
30	3.0
32	3.2
40	4.0

⑧ Corner angle

Symbol	Clearance
D	15°
E	20°
F	25°
G	30°
P	11°
	

⑨ Symbols of major cutting edge

Symbol	Condition of cutting edge	Shape
F	Sharp edge	
E	Round honing	
T	Angle honing	
S	Combination Honing	

Symbol	Corner angle	
A	45°	
E	75°	
P	90°	
Z	others	
MO	Round	

⑩ Feed direction

Symbol	Hand
R	Right
L	Left
N	Neutral

⑪ Classification Ⅰ

Symbol	Work
P	Steel
M	Stainless Steel
K	Cast iron
N	Non ferrous material
S	Heat resistant alloy
H	Hardened material

⑫ Classification Ⅱ

Symbol	Application
L	Light cutting
M	Medium cutting
H	Heavy cutting

HIGH FEED TOOLS LINE-UP

HIGH STRENGTH INSERT WITH
SHARPNESS & STABILITY.
RELIABLE EVEN AT HIGH FEED RATE &
HIGH DEPTH OF CUT.
DEVELOPED FOR HIGH METAL ROMOVAL
MACHINING.

ap≦3mm

SKS SERIES

Rigidity

SKS SERIES

SKS EXTREME EXSKS 09 Type



- 6 cutting edges
- High metal romoval
- Max.ap = 3mm
- Machine type: BT50
- Program R : R3.5

SKS EXTREME EXSKS 07 Type



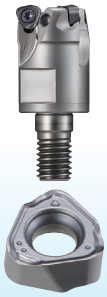
- 6 cutting edges
- Excellent balance of stability and sharpness
- Max.ap = 2mm
- Machine type: BT50
- Program R : R3.0

SKS GII SKG/MSG Type



- 4 cutting edges
- For High feed & High D.O.C. machining
- Max.ap = 1.5-2.5mm
- Machine type: BT40-50
- Program R : R2.0-R4.0

SKS EXTREME EXSKS 05 Type



- 6 cutting edges
- For High feed machining with multi-flutes
- Max.ap = 1.5mm
- Machine type: BT40-50
- Program R : R2.5

ADVANCED 3-D SHAPED CUTTING EDGE INSERT WITH LOW CUTTING FORCE GEOMETRY . MULTI-FLUTES SPEC. HOLDER . DEVELOPED FOR HIGH SPEED MACHINING EVEN ON SMALL SIZED MACHINE.

ap ≦ 1mm

QM SERIES

Low cutting force

QM SERIES

QM MAX GII GMX/MXG Type



- 4 cutting edges
- Machining wide variety of materials
- Max.ap = 1.0mm
- Machine type: BT40-50
- Program R : R1.5

QM MAX QXP/MQX Type



- 2 cutting edges
- Multiple insert choices for wide range of applications
- Max.ap = 1.0mm
- Machine type: BT40-50
- Program R : R1.5

QM GII GMX07/MXG07 Type



- 4 cutting edges
- Machining wide variety of materials
- Max.ap = 0.5mm
- Machine type: BT30-40
- Program R : R1.0

QM MPM/PME Type



- 2 cutting edges
- For roughing to finishing
- low cutting force
- Max.ap = 0.4mm
- Machine type: BT30-40
- Program R : R1.0

● Range of Tool Dia.

Product	No. of corners	Insert spec.	Max. ap(mm)	DC (mm) 10	12	16	20	25	32	40	50	52	63	66	80	100	125	160
QM	2	single sided	0.4	←	—	—	—	—	→									
QM G II	4	double sided	0.5	←	—	→												
QM MAX	2	single sided	1.0			←	—	—	—	—	—	—	—	→				
QM MAX G II	4	double sided	1.0			←	—	—	—	—	—	—	—	→				
EXSKS 05	6	double sided	1.5				←	—	—	—	—	—	→					
SKSG II	4	single sided	0.9-2.5				←	—	—	—	—	—	—	—	—	→		
EXSKS 07	6	double sided	2.0						←	—	—	—	—	—	—	→		
EXSKS 09	6	double sided	3.0								←	—	—	—	—	—	—	→

SHOULDER MILLING TOOLS LINE-UP

■ Shoulder Milling Series

SIC-EVO (ZOMT16)
QM MAX (ZPMT10)
QM MILL (ZOMT06)



- Single-sided 2 cutting edge insert
- Excellent chips control design
- Reliable even for long overhang machining

SHOULDER EXTREME
EXSAP-11 type
EXSAP-17 type



- Double-sided 4 cutting edge insert
- G class ground insert gives good surface finish on bottom & side wall

SHOULDER 6
EXSIX type



- Double-sided 6 cutting edge insert
- High cutting edge strength
- For heavy roughing process

■ Range of Tool Dia.

Product	No.of corners	Insert spec.	MAX. ap (mm)	Tool Dia. (mm)
				10 16 20 25 32 40 50 52 63 66 80 100 125 160
QM MILL	2	Single sided	5	Ø10～Ø32
QM MAX	2	Single sided	9	Ø16～Ø66
SIC-EVO	2	Single sided	15	Ø25～Ø125
EXSAP-11	4	Double sided	10	Ø16～Ø80
EXSAP-17	4	Double sided	15	Ø25～Ø125
EXSIX	6	Double sided	10	Ø50～Ø160

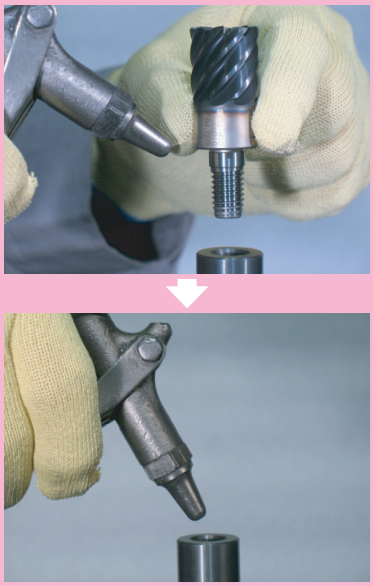
■ Selection Guide

Product	Cutting Force	Chip Control	Surface Finish	Wall Accuracy	Cutting Edge Strength	No. of Cutting Edges
SIC-EVO (ZOMT16) QM MAX (ZPMT10) QM MILL (ZOMT06)	★★★	★★★	★★	★★	★	★
EXSAP11 EXSAP17	★★	★★	★★★	★★★	★★	★★
EXSIX	★★	★★	★	★★	★★★	★★★

Modular Head Series

■ PROPER MOUNTING OF MODULAR HEADS

1 Cleaning



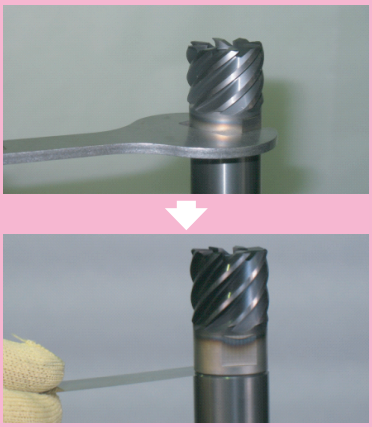
Remove dirt and chips with air from the connecting thread and face of modular head and MSN/MGN shank holder.

2 Initial Tightening



Tighten by hand until the head and the shank holder faces touch.

3 Final Tightening



Tighten slowly with torque control spanner wrench or DIJET DS type spanner wrench and confrm that there is no gap.

Attention)
1. Final tightening without initial tightening causes connecting thread damage.
2. Only use DS type spanner wrench using Solid modular head (SMSA/SMSR/SMAL type)

Attention

1. Only use torque control spanner wrench or DIJET DS type spanner wrench.
   In case of choosing torque control spanner wrench, confirm that the wrench size is matched to the dimensions W & C of each modular head.
2. Only apply gentle pressure on wrench.
3. Confirm there is no gap between MSN/MGN shank holder and modular head



Torque control spanner



Spanner wrench (DS type)

■ **Steel modular heads**

Thread	Tightening torque	Spanner size(W)
M6	8.0N·m	8☆,10
M8	16N·m	12☆
M10	16N·m	14, 15
M12	20N·m	17, 19
M16	25N·m	22, 26

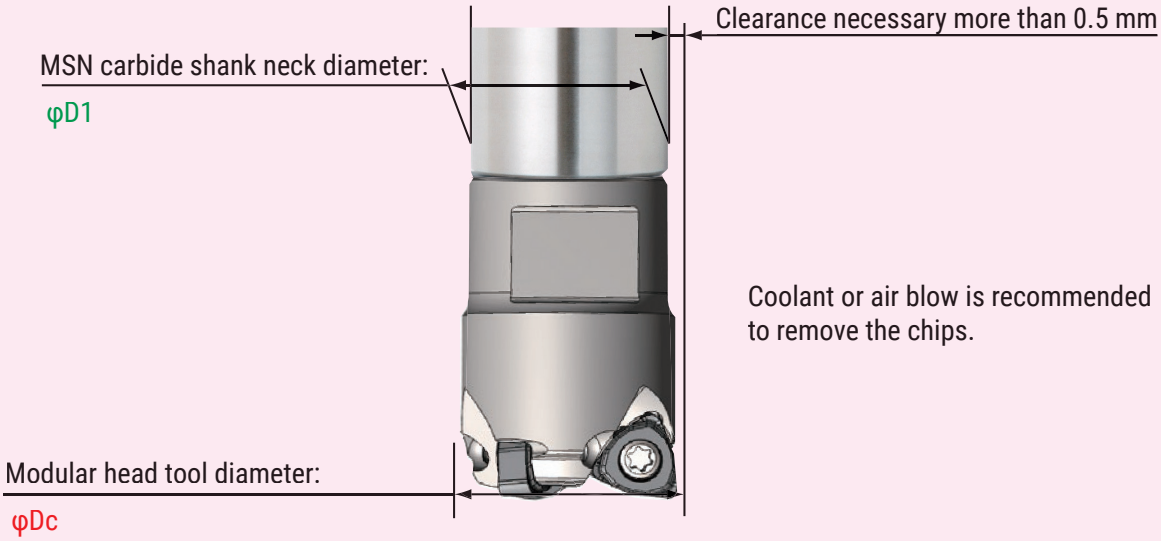
■ **Solid modular heads(SMSA/SMSR/SMAL)**

Thread	Tightening torque	Spanner size(W)	Cat.No.
M8	10～11N·m	14	DS-14
M10	10～11N·m	14	DS-14
M10	10～16N·m	17	DS-17
M12	15～20N·m	19, 22	DS-19, DS-22
M16	20～25N·m	27	DS-27

Note) Modular heads are supplied without spanner wrench

SELECTION OF MSN CARBIDE SHANK HOLDER

When using modular head over Ø 16mm, please select MSN carbide shank with a diameter (Ø D1) at least 1mm smaller than modular head (Ø Dc).
Wrong selection can cause damage to the carbide shank.



⚠ Caution for mounting in shrink fit holder.

When you use a carbide shank and a modular head on a shrink fit holder, please shrink fit only the carbide shank without mounting the modular head. Mount the modular head on the shank after shrink fit operation is complete.
In case of shrink fit MSN shank + modular head together, it will be difficult to loosen due to heat

5–AXIS Series



TECHNOLOGY

Designs that allow you to machine freely & quickly

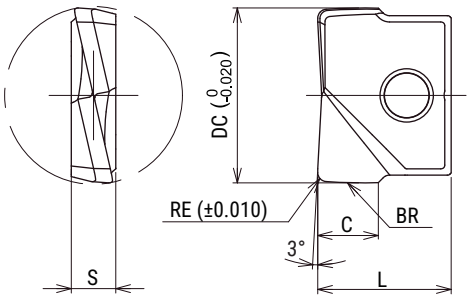
Advanced machining technology that enables high-precision and high efficiency

A line-up that supports machining of complex shapes found in the Die&Mould and Aerospace industries.

5 axis

KRM TYPE Insert for "MIRROR BARREL"





Radius form accuracy on the outer periphery ±0.010mm

Corner radius accuracy of inserts within ±0.010mm

Cat.No.	Grade		Dimensions (mm)					
	JC8015	DH102	DC	RE	BR	L	S	C
KRM-160-R10-BR50	●	●	16	1	50	12	4	5.7
KRM-200-R10-BR60	●	●	20	1	60	15	5	6.8
KRM-250-R10-BR60	●	●	25	1	60	18.5	6	7.3
KRM-300-R10-BR60	●	●	30	1	60	22.5	7	9.1

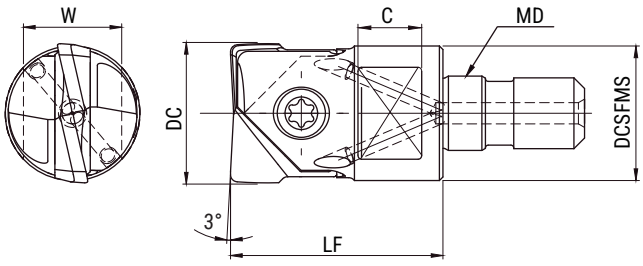
Through coolant hole

5 axis

MRX TYPE Modular Type

Accuracy of MRX after combined O.D. run out: below 15μm (Target below 10 μm).
When using KRM type insert/Corner radius accuracy: within ±0.010mm. Radius form accuracy on the outer periphery: within ±0.010mm.





Cat.No.	Stock	Dimensions (mm)						Insert		Parts	
		DC	LF	DCSFMS	MD	C	W			Screw	Wrench
MRX-160-M8	●	16	23	15	M8	8	12	RNM-160/170... FRM-160/170...	/HRM-160/170... /KRM-160...	FSW-4013H	A-15
MRX-200-M10	●	20	30	18.5	M10	9	14	RNM-200... FRM-200/210...	/HRM-200/220... /KRM-200...	FSW-5016H	A-20W
MRX-250-M12	●	25	35	24	M12	10	17	–	/FRM-250... /KRM-250...	FSW-6020	A-30
MRX-300-M16	○	30	43	29	M16	12.5	22	–	/FRM-300... /KRM-300...	KSW-8025	A-30

Clamp screw	Torque(N·m)
FSW-4013H	3.0
FSW-5016H	4.0
FSW-6020	6.0
KSW-8025	6.0

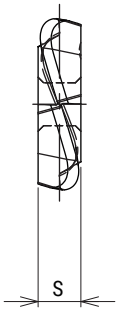
5–AXIS Series — TNM Type

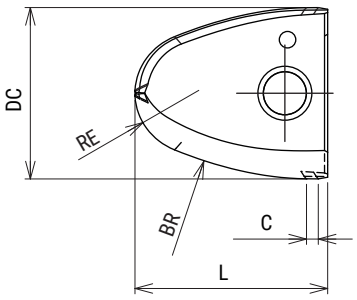
5 axis

TNM TYPE — Insert for "MIRROR BARREL"









Corner radius accuracy of inserts within ±0.010mm

Cat.No.	Grade		Dimensions (mm)					
	JC8015	FZ15	DC	RE	BR	L	S	C
TNM-160-NR6BR32	●	●	16	6	32	18	4	1
TNM-200-NR8BR40	●	●	20	8	40	21	5	1

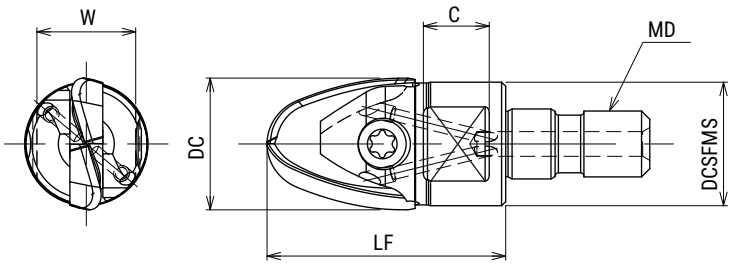
Through coolant hole

5 axis

MTP TYPE — MIRROR BARREL Modular Type

Accuracy of MTP after combined O.D. run out: below 15 μm (Target below 10 μm).
When using TNM type insert / Radius form accuracy on the outer periphery: within ±0.010mm.



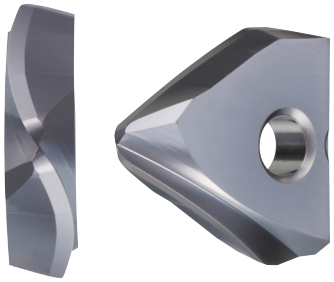


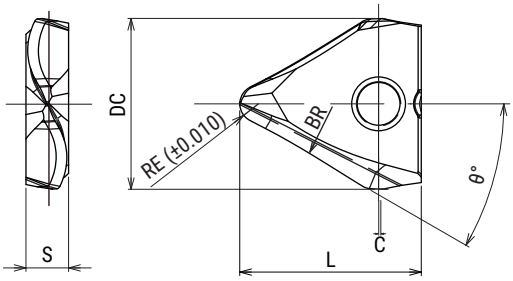
Cat.No.	Stock	Dimensions (mm)						Insert	Parts	
		DC	LF	DCSFMS	MD	C	W		Screw	Wrench
MTP-160-M8	●	16	29	15	M8	8	12	TPM-160... TNM-160...	FSW-4013H	A-15
MTP-200-M10	●	20	36	19	M10	9	14	TPM-200... TNM-200...	FSW-5016H	A-20W

Clamp screw	Torque(N·m)
FSW-4013H	3.0
FSW-5016H	4.0

5 axis

TPM TYPE Insert for "MIRROR BARREL"





Radius form accuracy on the outer periphery ±0.010mm

Radius accuracy of inserts within ±0.010mm

Cat.No.	Grade		Dimensions (mm)						
	JC8015	DH102	DC	RE	BR	L	S	C	θ°
TPM-160-NR2T30BR400	●	●	16	2	400	17	4	1	30°
TPM-200-NR2T30BR500	●	●	20	2	500	20	5	1	30°

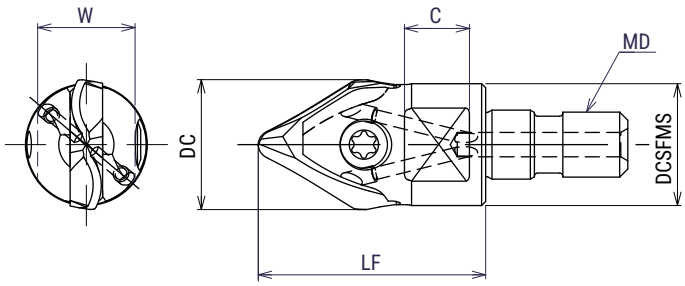
Through coolant hole

5 axis

MTP TYPE MIRROR BARREL Modular Type

Accuracy of MTP after combined O.D. run out: below 15 μm (Target below 10μm).
When using TPM type insert / Corner Radius accuracy: within ±0.010mm. Radius form accuracy on the outer periphery: within ±0.010mm.





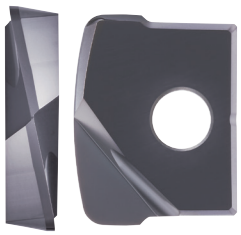
Cat.No.	Stock	Dimensions (mm)						Insert	Parts	
		DC	LF	DCSFMS	MD	C	W		Screw	Wrench
MTP-160-M8	●	16	28	15	M8	8	12	TPM-160... TNM-160...	FSW-4013H	A-15
MTP-200-M10	●	20	35	19	M10	9	14	TPM-200... TNM-200...	FSW-5016H	A-20W

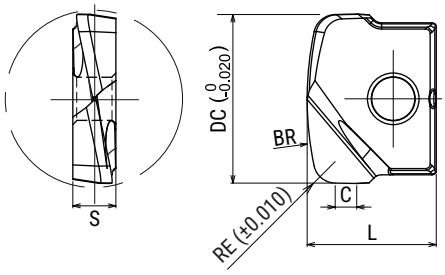
Clamp screw	Torque(N·m)
FSW-4013H	3.0
FSW-5016H	4.0

5–AXIS Series — LRM Type

LRM TYPE — Insert for "MIRROR BARREL"

5 axis





Radius form accuracy on the bottom ±0.010mm

Corner radius accuracy of inserts within ±0.010mm

Cat.No.	Grade		Dimensions (mm)					
	JC8015	DH102	DC	RE	BR	L	S	C
LRM-160-R20-BR32	●	●	16	2	32	12	4	2
LRM-200-R30-BR40	●	●	20	3	40	15	5	2
LRM-250-R30-BR50	●	●	25	3	50	18.5	6	2.5
LRM-300-R30-BR60	●	●	30	3	60	22.5	7	3

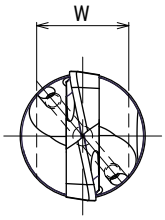
MBX TYPE — Modular Type

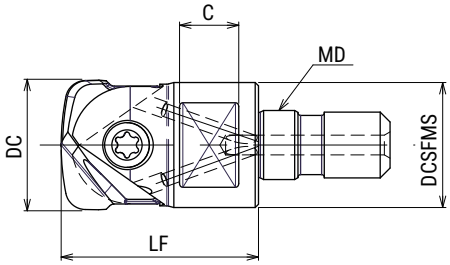
Through coolant hole

5 axis

Accuracy of MBX after combined O.D. run out: below 15μm (Target below 10μm).
When using LRM type insert/Corner radius accuracy: within ±0.010mm. Radius form accuracy on the front edge: within ±0.010mm.







Cat.No.	Stock	Dimensions (mm)						Insert		Parts	
		DC	LF	DCSFMS	MD	C	W			Screw	Wrench
MBX-160-M8	●	16	23	15	M8	8	12	BNM-160...	LRM-160...	FSW-4013H	A-15
MBX-200-M10	●	20	30	19	M10	9	14	BNM-200...	LRM-200...	FSW-5016H	A-20W
MBX-250-M12	●	25	35	24	M12	10	17	BNM-250...	LRM-250...	FSW-6020	A-30
MBX-300-M16	●	30	43	29	M16	12.5	22	BNM-300...	LRM-300...	KSW-8025	A-30

Clamp screw	Torque(N.m)
FSW-4013H	3.0
FSW-5016H	4.0
FSW-6020	6.0
KSW-8025	6.0

5–AXIS Series — MQT Type

Through coolant hole | Face Milling | Shoulder Milling

MQT TYPE — High precision “QM MAX”

- 3 different angled bodies (0°, 3°, and 5°) that cover a range of tapered walls from 0° ~ 8°
- Possible to use even on 3 axis machine with 3°or 5°angled body ; A03 type or A05 type
- High tolerance insert-pocket for the ground inserts
- High efficiency with multi flutes



Fig.1

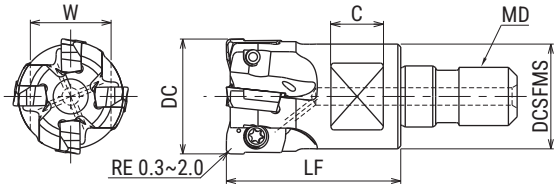
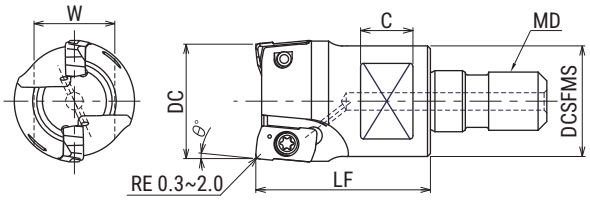


Fig.2



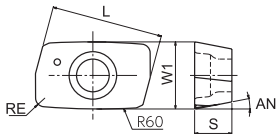
Inclination angle θ°	Cat.No.	Stock	No. of inserts	Dimensions (mm)						Parts		Insert	Fig.
				DC	LF	DCSFMS	MD	C	W	Screws	Wrench		
0°	MQT-2016A00-M8	●	2	16	23	14	M8	8	12	TSW-2556H	A-08	XP**100308ZER-R YPHW1003**Z*R-** ZPMT1003**ZER-PL	1
	MQT-4020A00-M10	●	4	20	30	18	M10	9	14				1
	MQT-5025A00-M12	●	5	25	35	22.5	M12	10	17	DSW-2563H			1
	MQT-6032A00-M16	●	6	32	43	29	M16	12	22				1
	MQT-6035A00-M16	●	6	35	43	29	M16	12	22				1
3°	MQT-2016A03-M8	●	2	16	23	14	M8	8	12	TSW-2556H			2
	MQT-2020A03-M10	●	2	20	30	18	M10	9	14				2
5°	MQT-2016A05-M8	●	2	16	23	14	M8	8	12				2
	MQT-2020A05-M10	●	2	20	30	18	M10	9	14				2

Clamp screw	Torque(N.m)
TSW-2556H	1.1
DSW-2563H	

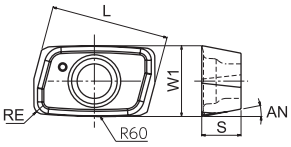
MQT TYPE Insert

For tapered wall finishing
(XPHW100308ZER-R)
(XPHT100308RZER-R)

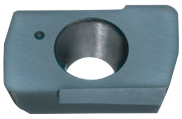


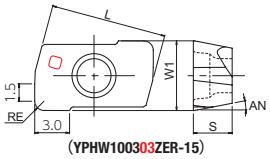




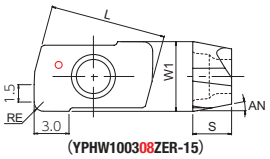


For finishing side face
(YPHW1003ZER-15)**
(YPHW100308ZER-F)
(YPHW100308ZTR-F1)

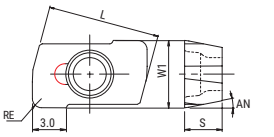




(YPHW100303ZER-15)



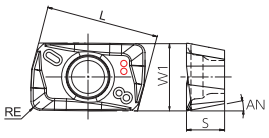
(YPHW100308ZER-15)



(YPHW100308ZER-F) (for low feed)

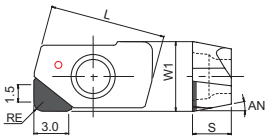
Shoulder milling insert
(for semi-finishing to finishing)
ZPMT1003ZER-PL***





CBN Insert





(YPHW100308ZTR-F1)

Type	Cat.No.	Tolerance	PVD Coating				Cermet	CBN	Dimensions (mm)				
			DH102	JC8015	JC8050	JC8118	CX75	JBN795	RE	L	W1	S	AN
For Tapered wall finishing	XPHW100308ZER-R	H	●	●			●		0.8	10.06	6	3.35	11°
	XPHT100308ZER-R	H		●			●		0.8	10.06	6	3.35	11°
For Finishing side face	YPHW100303ZER-15	H	●	●			●		0.3	10.06	6	3.35	11°
	YPHW100308ZER-15	H	●				●		0.8	10.06	6	3.35	11°
	YPHW100308ZER-F	H		●					0.8	10.06	6	3.35	11°
	YPHW100308ZTR-F1	H						○	0.8	10.06	6	3.35	11°
Shoulder milling insert (for semi-finishing to finishing)	ZPMT100304ZER-PL	M	●		●	●	●		0.4	10.08	6	3.4	11°
	ZPMT100308ZER-PL	M	●		●	●	●		0.8	10.08	6	3.4	11°
	ZPMT100320ZER-PL	M	●		●	●	●		2	10.08	6	3.4	11°

5-AXIS Series — KRM Type

■ Recommended Cutting Conditions

● KRM Type - Side finishing

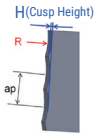


Material	Grade	Tool dia. (mm)															
		16				20				25				30			
		ap (mm)	ae (mm)	n (min⁻¹)	Vf (mm/min)	ap (mm)	ae (mm)	n (min⁻¹)	Vf (mm/min)	ap (mm)	ae (mm)	n (min⁻¹)	Vf (mm/min)	ap (mm)	ae (mm)	n (min⁻¹)	Vf (mm/min)
Carbon steel below 250HB	JC8015	0.8	0.15	5,970	2,390	1	0.15	4,770	1,910	1.2	0.15	3,820	1,530	1.2	0.15	3,180	1,270
Cast steel below 285HB	JC8015	0.8	0.15	5,970	2,390	1	0.15	4,770	1,910	1.2	0.15	3,820	1,530	1.2	0.15	3,180	1,270
Tool&die steel below 255HB	JC8015	0.8	0.15	5,970	2,390	1	0.15	4,770	1,910	1.2	0.15	3,820	1,530	1.2	0.15	3,180	1,270
Mold steel 30-36HRC	JC8015	0.8	0.12	5,970	2,390	1	0.12	4,770	1,910	1.2	0.15	3,820	1,530	1.2	0.15	3,180	1,270
Mold steel 38-43HRC	JC8015	0.8	0.12	5,570	1,670	1	0.12	4,460	1,340	1	0.12	3,570	1,070	1	0.12	2,970	890
Hardened die steel 42-52HRC	DH102	0.6	0.1	4,970	750	0.7	0.1	3,980	600	0.8	0.1	3,180	480	0.8	0.1	2,650	400
Hardened die steel 55-62HRC	DH102	0.5	0.1	3,980	600	0.7	0.1	3,180	480	0.7	0.1	2,550	380	0.7	0.1	2,120	320
Grey cast iron 160-260HB	DH102	0.8	0.2	6,960	3,480	1	0.2	5,570	3,340	1.2	0.2	4,460	2,680	1.2	0.2	3,710	2,230
Nodular cast iron 170-300HB	DH102	0.8	0.2	6,960	3,480	1	0.2	5,570	3,340	1.2	0.2	4,460	2,680	1.2	0.2	3,710	2,230
Austenitic stainless steel	JC8015	0.8	0.12	5,570	2,230	1	0.12	4,460	1,780	1.2	0.12	3,570	1,430	1.2	0.12	2,970	1,190
Ferittic&Martensitic stainless steel	JC8015	0.8	0.12	5,570	2,230	1	0.12	4,460	1,780	1.2	0.12	3,570	1,430	1.2	0.12	2,970	1,190
Titanium alloy (Ti-6Al-4V) 35-43HRC	JC8015	0.5	0.1	1,990	480	0.6	0.1	1,590	380	0.7	0.1	1,270	320	0.7	0.1	1,060	270
Heat resistant alloy (INCO718) 35-43HRC	JC8015	0.5	0.1	1,590	380	0.6	0.1	1,270	300	0.7	0.1	1,020	260	0.7	0.1	850	210

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. These parameters are for overhang length 3Dc. See right table for longer application.
3. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
4. Use air blow.

Overhang (ℓ/Dc)	n (min⁻¹)	Vf (mm/min)
~ 3Dc	100%	100%
3Dc ~ 5Dc	70%	70%
5Dc ~ 10Dc	50%	50%

Please refer to chart and formula below to calculate ap.



$$ap = 2\sqrt{(R^2-(R-H)^2)}$$

Pick amount ap (mm)		Cusp height (mm)									
Cat.No.	R	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.010
KRM-160-R10-BR50	50	0.63	0.89	1.10	1.26	1.41	1.55	1.67	1.79	1.90	2.00
KRM-200-R10-BR60	60	0.69	0.98	1.20	1.39	1.55	1.70	1.83	1.96	2.08	2.19
KRM-250-R10-BR60											
KRM-300-R10-BR60											

■ Recommended Cutting Conditions

● TNM Type - Side finishing with Barrel R



● Side finishing with Tip R



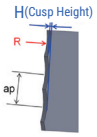
Material	Grade	Tool dia. (mm)							
		16				20			
		ap (mm)	ae (mm)	n (min⁻¹)	Vf (mm/min)	ap (mm)	ae (mm)	n (min⁻¹)	Vf (mm/min)
Carbon steel below 250HB	JC8015	~1	0.2	6,960	2,780	~1	0.2	5,570	2,230
Cast steel below 285HB	JC8015	~1	0.2	6,960	2,780	~1	0.2	5,570	2,230
Tool&die steel below 255HB	JC8015	~1	0.2	6,960	2,780	~1	0.2	5,570	2,230
Mold steel 30-36HRC	JC8015	~1	0.2	6,960	2,780	~1	0.2	5,570	2,230
Mold steel 38-43HRC	JC8015	~1	0.2	5,970	2,390	~1	0.2	4,770	1,910
Hardened die steel 42-52HRC	JC8015	~1	0.1	4,970	1,490	~1	0.1	3,980	1,190
Grey cast iron 160-260HB	JC8015	~1	0.2	6,960	2,780	~1	0.2	5,570	2,230
Nodular cast iron 170-300HB	JC8015	~1	0.2	6,960	2,780	~1	0.2	5,570	2,230
Austenitic stainless steel	JC8015	~1	0.2	6,960	2,090	~1	0.2	5,570	1,670
Ferittic&Martensitic stainless steel	JC8015	~1	0.2	6,960	2,090	~1	0.2	5,570	1,670
Titanium alloy (Ti-6Al-4V) 35-43HRC	JC8015	~0.4	0.15	4,970	1,490	~0.4	0.15	3,980	1,190
Heat resistant alloy (INCO718) 35-43HRC	JC8015	~0.4	0.1	3,980	800	~0.4	0.1	3,180	640
Aluminum alloy	FZ15	~1.5	0.25	9,980	4,980	~1.5	0.25	7,960	4,780

Material	Grade	Tool dia. (mm)							
		16				20			
		ap (mm)	ae (mm)	n (min⁻¹)	Vf (mm/min)	ap (mm)	ae (mm)	n (min⁻¹)	Vf (mm/min)
Carbon steel below 250HB	JC8015	0.15	0.2	10,940	4,380	0.15	0.25	8,750	5,250
Cast steel below 285HB	JC8015	0.15	0.2	10,940	4,380	0.15	0.25	8,750	5,250
Tool&die steel below 255HB	JC8015	0.15	0.2	10,940	4,380	0.15	0.25	8,750	5,250
Mold steel 30-36HRC	JC8015	0.15	0.2	9,950	3,980	0.15	0.25	7,960	4,780
Mold steel 38-43HRC	JC8015	0.1	0.2	7,960	2,390	0.1	0.25	6,370	3,190
Hardened die steel 42-52HRC	JC8015	0.1	0.2	5,970	1,790	0.1	0.25	4,770	2,390
Grey cast iron 160-260HB	JC8015	0.15	0.2	10,940	5,470	0.15	0.25	8,750	6,130
Nodular cast iron 170-300HB	JC8015	0.15	0.2	10,940	5,470	0.15	0.25	8,750	6,130
Austenitic stainless steel	JC8015	0.15	0.2	10,940	4,380	0.15	0.25	8,750	5,250
Ferittic&Martensitic stainless steel	JC8015	0.15	0.2	10,940	4,380	0.15	0.25	8,750	5,250
Titanium alloy (Ti-6Al-4V) 35-43HRC	JC8015	0.1	0.2	7,960	3,180	0.1	0.25	6,370	3,190
Heat resistant alloy (INCO718) 35-43HRC	JC8015	0.1	0.1	5,970	1,790	0.1	0.1	4,770	1,910
Aluminum alloy	FZ15	0.25	0.2	13,330	6,670	0.25	0.2	10,660	6,400

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. These parameters are for overhang length 3Dc. See right table for longer application.
3. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
4. Use air blow.

Overhang (ℓ/Dc)	n (min⁻¹)	Vf (mm/min)
~ 3Dc	100%	100%
3Dc ~ 5Dc	70%	70%
5Dc ~ 10Dc	50%	50%

Please refer to chart and formula below to calculate ap.



$$ap = 2\sqrt{(R^2-(R-H)^2)}$$

Pick amount ap (mm)		Cusp height (mm)									
Cat.No.	R	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.010
TNM-160-NR6BR32	32	0.51	0.72	0.88	1.01	1.13	1.24	1.34	1.43	1.52	1.60
TNM-200-NR8BR40	40	0.57	0.80	0.98	1.13	1.26	1.39	1.50	1.60	1.70	1.79

5-AXIS Series — TPM Type

■ Recommended Cutting Conditions

● TPM Type - with Barrel R



● with Tip R



Material	Grade	Tool dia. (mm)							
		16				20			
		ap (mm)	ae (mm)	n (min⁻¹)	Vf (mm/min)	ap (mm)	ae (mm)	n (min⁻¹)	Vf (mm/min)
Carbon steel below 250HB	JC8015	~4	0.15	13,930	4,180	~5	0.2	11,140	3,340
Cast steel below 285HB	JC8015	~4	0.15	13,930	4,180	~5	0.2	11,140	3,340
Tool&die steel below 255HB	JC8015	~4	0.15	13,930	4,180	~5	0.2	11,140	3,340
Mold steel 30-36HRC	JC8015	~3.5	0.12	11,940	3,580	~4.5	0.1	9,550	2,870
Mold steel 38-43HRC	JC8015	~3	0.12	9,950	2,990	~4	0.1	7,960	2,390
Hardened die steel 42-52HRC	JC8015	~2.5	0.1	6,960	1,390	~3	0.1	5,570	1,110
Hardened die steel 55-62HRC	JC8015	~2	0.1	5,970	1,190	~2.5	0.1	4,770	950
Grey cast iron 160-260HB	JC8015	~4	0.15	13,930	5,570	~5	0.2	11,140	4,460
Nodular cast iron 170-300HB	JC8015	~4	0.15	13,930	4,180	~5	0.2	11,140	3,340
Austenitic stainless steel	JC8015	~3	0.12	11,940	3,580	~4	0.1	9,550	2,870
Ferittic&Martensitic stainless steel	JC8015	~3	0.12	11,940	3,580	~4	0.1	9,550	2,870
Titanium alloy (Ti-6Al-4V) 35-43HRC	JC8015	~2.5	0.1	5,970	1,190	~3	0.1	4,770	950
Heat resistant alloy (INCO718) 35-43HRC	JC8015	~2.5	0.1	3,980	800	~3	0.1	3,180	640

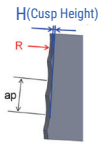
Material	Grade	Tool dia. (mm)							
		16				20			
		ap (mm)	ae (mm)	n (min⁻¹)	Vf (mm/min)	ap (mm)	ae (mm)	n (min⁻¹)	Vf (mm/min)
Carbon steel below 250HB	JC8015	0.1	0.2	15,920	1,590	0.1	0.2	12,730	1,530
Cast steel below 285HB	JC8015	0.1	0.2	15,920	1,590	0.1	0.2	12,730	1,530
Tool&die steel below 255HB	JC8015	0.1	0.2	15,920	1,590	0.1	0.2	12,730	1,530
Mold steel 30-36HRC	JC8015	0.1	0.2	14,920	1,490	0.1	0.2	11,940	1,430
Mold steel 38-43HRC	JC8015	0.1	0.2	13,930	1,390	0.1	0.2	11,140	1,110
Hardened die steel 42-52HRC	JC8015	0.08	0.2	9,950	1,000	0.08	0.2	7,960	960
Hardened die steel 55-62HRC	JC8015	0.08	0.2	8,950	900	0.08	0.2	7,160	860
Grey cast iron 160-260HB	JC8015	0.12	0.2	16,910	1,690	0.12	0.2	13,530	1,620
Nodular cast iron 170-300HB	JC8015	0.12	0.2	15,920	1,590	0.12	0.2	12,730	1,530
Austenitic stainless steel	JC8015	0.1	0.2	14,920	1,490	0.1	0.2	11,940	1,430
Ferittic&Martensitic stainless steel	JC8015	0.1	0.2	14,920	1,490	0.1	0.2	11,940	1,430
Titanium alloy (Ti-6Al-4V) 35-43HRC	JC8015	0.06	0.2	5,970	600	0.06	0.2	4,770	570
Heat resistant alloy (INCO718) 35-43HRC	JC8015	0.05	0.2	3,980	400	0.05	0.2	3,180	380

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. These parameters are for overhang length 3Dc. See right table for longer application.
3. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
4. Use air blow.

Overhang (ℓ/Dc)	n (min⁻¹)	Vf (mm/min)
~ 3Dc	100%	100%
3Dc ~ 5Dc	70%	70%
5Dc ~ 10Dc	50%	50%

Please refer to chart and formula below to calculate ap.

$$a_p = 2\sqrt{(R^2-(R-H)^2)}$$



Pick amount ap (mm)		Cusp height (mm)									
Cat.No.	R	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.010
TPM-160-NR2T30BR400	400	1.79	2.53	3.10	3.58	4.00	4.38	4.73	5.06	5.73	5.66
TPM-200-NR2T30BR500	500	2.00	2.83	3.46	4.00	4.47	1.39	4.90	5.66	6.00	6.32

■ Recommended Cutting Conditions



● LRM Type

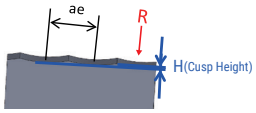
Material	Grade	Tool dia. (mm)															
		16				20				25				30			
		ap (mm)	ae (mm)	n (min⁻¹)	Vf (mm/min)	ap (mm)	ae (mm)	n (min⁻¹)	Vf (mm/min)	ap (mm)	ae (mm)	n (min⁻¹)	Vf (mm/min)	ap (mm)	ae (mm)	n (min⁻¹)	Vf (mm/min)
Carbon steel below 250HB	JC8015	0.15	~0.6	7,960	4,780	0.15	~0.7	6,370	4,460	0.15	~0.8	5,730	4,010	0.15	~0.8	4,770	3,340
Cast steel below 285HB	JC8015	0.15	~0.6	7,960	4,780	0.15	~0.7	6,370	4,460	0.15	~0.8	5,730	4,010	0.15	~0.8	4,770	3,340
Tool&die steel below 255HB	JC8015	0.15	~0.6	7,960	4,780	0.15	~0.7	6,370	4,460	0.15	~0.8	5,730	4,010	0.15	~0.8	4,770	3,340
Mold steel 30-36HRC	JC8015	0.1	~0.6	7,960	3,980	0.1	~0.7	6,370	3,820	0.1	~0.8	5,730	3,440	0.1	~0.8	4,770	2,860
Mold steel 38-43HRC	JC8015	0.1	~0.6	6,960	3,480	0.1	~0.7	5,570	3,340	0.1	~0.8	5,090	3,050	0.1	~0.8	4,240	2,540
Hardened die steel 42-52HRC	DH102	0.1	~0.5	5,970	2,390	0.1	~0.6	4,770	2,390	0.1	~0.7	4,460	2,230	0.1	~0.7	3,710	1,860
Hardened die steel 55-62HRC	DH102	0.1	~0.5	4,970	1,990	0.1	~0.6	3,980	1,590	0.1	~0.7	3,820	1,530	0.1	~0.7	3,180	1,270
HSS 55-62HRC	DH102	0.05	~0.25	3,980	1,190	0.05	~0.25	3,180	950	0.05	~0.25	2,550	770	0.05	~0.25	2,120	640
Grey cast iron 160-260HB	DH102	0.15	~0.6	7,960	4,780	0.15	~0.7	6,370	4,460	0.15	~0.8	5,730	4,010	0.15	~0.8	4,770	3,340
Nodular cast iron 170-300HB	DH102	0.15	~0.6	6,960	4,180	0.15	~0.7	5,570	3,900	0.15	~0.8	5,730	4,010	0.15	~0.8	4,770	3,340
Austenitic stainless steel	JC8015	0.15	~0.6	7,960	3,980	0.15	~0.7	6,370	3,820	0.15	~0.8	5,730	3,440	0.15	~0.8	4,770	2,860
Ferittic&Martensitic stainless steel	JC8015	0.15	~0.6	7,960	3,980	0.15	~0.7	6,370	3,820	0.15	~0.8	5,730	3,440	0.15	~0.8	4,770	2,860
Titanium alloy (Ti-6Al-4V) 35-43HRC	JC8015	0.1	~0.6	4,970	1,990	0.1	~0.7	3,980	1,990	0.1	~0.8	3,180	1,590	0.1	~0.8	2,650	1,330
Heat resistant alloy (INCO718) 35-43HRC	JC8015	0.1	~0.25	3,980	1,190	0.1	~0.3	3,180	1,270	0.1	~0.3	2,550	1,020	0.1	~0.3	2,120	850

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. These parameters are for overhang length 3Dc. See right table for longer application.
3. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
4. Use air blow.

Overhang (ℓ/Dc)	n (min⁻¹)	Vf (mm/min)
~ 3Dc	100%	100%
3Dc ~ 5Dc	70%	70%
5Dc ~ 10Dc	50%	50%

Please refer to chart and formula below to calculate ap.

$$a_e = 2\sqrt{(R^2-(R-H)^2)}$$



Pick amount ap (mm)		Cusp height (mm)									
Cat.No.	R	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.010
LRM-160-R20-BR32	32	0.51	0.72	0.88	1.01	1.13	1.24	1.34	1.43	1.52	1.60
LRM-200-R30-BR40	40	0.57	0.80	0.98	1.13	1.26	1.39	1.50	1.60	1.70	1.79
LRM-250-R30-BR50	50	0.63	0.89	1.10	1.26	1.41	1.55	1.67	1.79	1.90	2.00
LRM-300-R30-BR60	60	0.69	0.98	1.20	1.39	1.55	1.70	1.83	1.96	2.08	2.19

■ Definition of edge shape for programming

◦ When using taper holder (MQT-***A03/05 type)

Fig.1 XPHW/T

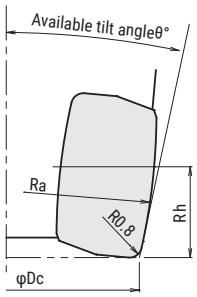
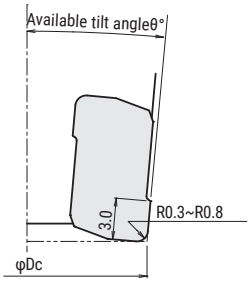


Fig.2 YPHW



◦ Dimensions when using XPHW / T insert

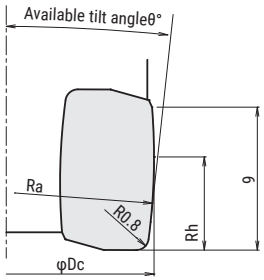
available tilt angle	Cat.No	Dimensions (mm)			Fig
		φDc	Ra	Rh	
1°~6°	MQT-2016A03-M8	15.5	R64.19	8.76	1
3°~8°	MQT-2016A05-M8	15.5	R64.34	10.98	1
1°~6°	MQT-2020A03-M10	19.5	R63.34	8.67	1
3°~8°	MQT-2020A05-M10	19.5	R63.46	10.85	1

◦ Dimensions when using YPHW insert

available tilt angle	Cat.No	Dimensions (mm)	Fig
		φDc	
3°	MQT-2016A03-M8	16	2
5°	MQT-2016A05-M8	16	2
3°	MQT-2020A03-M10	20	2
5°	MQT-2020A05-M10	20	2

◦ When using straight holder (MQT-***A00 type)

Fig.3 XPHW/T



◦ Dimensions when using XPHW/T insert

available tilt angle	Cat.No	Dimensions (mm)			Fig
		φDc	Ra	Rh	
0°~3°	MQT-2016A00-M8	16	R63.27	5.48	3
0°~3°	MQT-4020A00-M10	20	R64.29	5.48	3
0°~3°	MQT-5025A00-M12	25	R63.26	5.48	3
0°~3	MQT-6032A00-M16	32	R62.41	5.48	3
0°~3°	MQT-6035A00-M16	35	R62.16	5.48	3

◦ Dimensions when using YPHW insert

available tilt angle	Cat.No	Dimensions (mm)	Fig
		φDc	
0°	MQT-2016A00-M8	16	–
0°	MQT-4020A00-M10	20	–
0°	MQT-5025A00-M12	25	–
0°	MQT-6032A00-M16	32	–
0°	MQT-6035A00-M16	35	–

■ Recommended Cutting Conditions

● MQT Type - with XPHW/T insert for finishing side wall + MSN shank

Material	Grade		Tool dia. (mm)				
			16 2N	20 2N	20 4N	25 5N	32 6N
Carbon steel below 250HB	JC8015 XPHT (XPHW) (CX75)	ap(mm)	≦ 1.5	≦ 1.5	≦ 1.5	≦ 1.5	≦ 1.5
		ae(mm)	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12
		n(min⁻¹)	12,000	9,600	9,600	7,640	5,460
		Vf(mm/min)	4,800	3,840	7,680	7,640	6,550
Tool & die steel below 255HB	JC8015 XPHT (XPHW) (CX75)	ap(mm)	≦ 1.5	≦ 1.5	≦ 1.5	≦ 1.5	≦ 1.5
		ae(mm)	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12
		n(min⁻¹)	10,000	8,000	8,000	6,400	4,500
		Vf(mm/min)	4,000	3,200	6,400	6,400	5,460
Mold steel 30-36HRC	JC8015 XPHT (XPHW) (DH102)	ap(mm)	≦ 1.2	≦ 1.2	≦ 1.2	≦ 1.2	≦ 1.2
		ae(mm)	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12
		n(min⁻¹)	9,000	7,200	7,200	5,730	4,090
		Vf(mm/min)	3,600	2,880	5,740	5,730	4,910
Mold steel 38-43HRC	DH102 XPHW (JC8015)	ap(mm)	≦ 1.0	≦ 1.0	≦ 1.0	≦ 1.0	≦ 1.0
		ae(mm)	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12
		n(min⁻¹)	8,000	6,400	6,400	5,100	3,640
		Vf(mm/min)	3,200	2,560	5,120	5,100	4,370
Hardened die steel 42-52HRC	DH102 XPHW (JC8015)	ap(mm)	≦ 1.0	≦ 1.0	≦ 1.0	≦ 1.0	≦ 1.0
		ae(mm)	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
		n(min⁻¹)	5,000	4,000	4,000	3,180	2,280
		Vf(mm/min)	1,500	1,200	2,400	2,380	2,050
Hardened die steel 55-62HRC	DH102 XPHW	ap(mm)	≦ 1.0	≦ 1.0	≦ 1.0	≦ 1.0	≦ 1.0
		ae(mm)	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
		n(min⁻¹)	3,600	2,860	2,860	2,300	1,640
		Vf(mm/min)	720	570	1,140	1,150	980
Grey & Nodular cast iron below 300HB	JC8015 XPHW (XPHT) (DH102)	ap(mm)	≦ 1.5	≦ 1.5	≦ 1.5	≦ 1.5	≦ 1.5
		ae(mm)	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12
		n(min⁻¹)	12,000	9,600	9,600	7,640	5,460
		Vf(mm/min)	6,000	4,800	9,600	9,550	8,190
Stainless steel below 250HB	JC8015 XPHT (XPHW)	ap(mm)	≦ 1.2	≦ 1.2	≦ 1.2	≦ 1.2	≦ 1.2
		ae(mm)	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12
		n(min⁻¹)	10,000	8,000	8,000	6,400	4,550
		Vf(mm/min)	4,000	3,200	6,400	6,400	5,460

Note
1. Figures to be adjusted according to machine rigidity or work rigidity.
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. Use air blow.

Cusp height : XPHT / XPHW

Cusp height (μm)	0.50	0.71	0.97	1.27	1.61	1.98	2.40	2.86	3.35	3.89	4.46	5.08	5.73	6.43	7.16	7.94
ap (mm)	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0

SKS-GII

SKG / MSG type, innovative High Feed Cutter achieved extremely excellent metal removal rate !

Feature 1

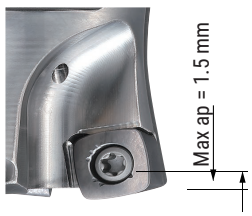
Provides stability even milling of deep cavities.

Feature 2

4 corner positive insert with low cutting forces.

Feature 3 **Flat top insert**

SKG-10 type insert : Max ap=1.5mm (using insert SPNW10-type)



SKG-14 type insert : Max ap=2.5mm (using insert SPNW14-type)



Feature 4 **Chip breaker insert**

Optimized cutting edge for machining of difficult to cut materials like titanium alloy.

Effective for machining that requires reduced cutting loads or long overhang application.



SM breaker for
difficult to cut materials



PM breaker for
mold steel

Feature 5

Insert grades for a wide range of materials <JC8118> <JC8050> <JC7550> <DS150>



JC8118
for **mold steel, hardned steel**
from 38HRC upto 50HRC



JC8050
for **mold steel, general steel**
below 36HRC



JC7550
for **Titanium alloy, stainless steel**



DS150
for **Titanium alloy**

Application

ISO	P					M					K				S				H		
	P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30	S01	S10	S20	S30	H01	H10	H20
Range		JC8118										JC8118								JC8118	
				JC8050												DS150					
									JC7550								JC7550				

Feature 6

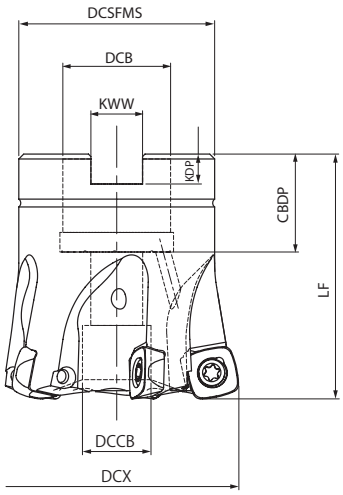
Excellent chip evacuation

SKS-GII — SKG / MSG Type

Through coolant hole | G - Body | Face Milling | Copy Milling | Pocket Milling | Helical Interpolation | Plunge Milling

SKG10 TYPE — Bore Type





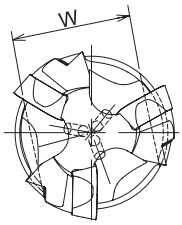
Cat.No.	Stock	No. of inserts	Dimensions (mm)								Arbor set bolt	Weight (kg)	Inserts
			DCX	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP			
SKG-4050R-10-22	●	4	50	50	40	22	14	10.4	6.3	20	M10X1.5X35★	0.3	SPNW10.. SPET10.. SPMT10..
SKG-5050R-10-22	●	5	50	50	40	22	14	10.4	6.3	20	M10X1.5X35★	0.3	
SKG-5052R-10-22	●	5	52	50	40	22	16.6	10.4	6.3	20	M10	0.3	
SKG-5063R-10-22	○	5	63	50	48	22	17	10.4	6.3	20	M10	0.5	
SKG-5063R-10-27	○	5	63	50	48	27	20	12.4	7	22	M12X1.75X30★	0.5	
SKG-6063R-10-22	●	6	63	50	48	22	17	10.4	6.3	20	M10	0.5	
SKG-6063R-10-27	●	6	63	50	48	27	20	12.4	7	22	M12X1.75X30★	0.5	
SKG-6066R-10-27	●	6	66	50	50	27	20	12.4	7	22	M12X1.75X30★	0.6	
SKG-6080R-10-27	●	6	80	50	60	27	20	12.4	7	22	M12X1.75X30★	0.9	

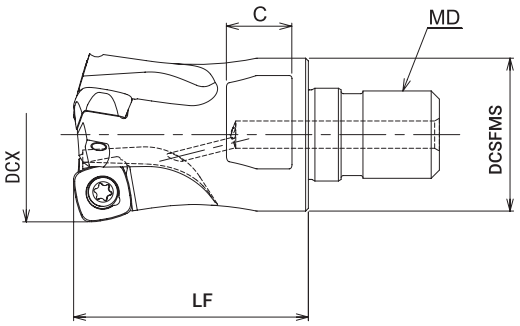
Screw	Torque(N.m)	Wrench
TSW-3509H	3.0	A-15T

MSG10 TYPE **Modular Type**

Through coolant hole | G - Body | Face Milling | Copy Milling | Pocket Milling | Helical Interpolation | Plunge Milling







Cat.No.	Stock	No. of inserts	Dimensions (mm)						Insert
			DCX	LF	DCSFMS	MD	C	W	
MSG-2025-10-M12	●	2	25	35	23	M12	11	19	SPNW10.. SPET10.. SPMT10..
MSG-3032-10-M16	●	3	32	43	28	M16	12	22	
MSG-3035-10-M16	○	3	35	43	30	M16	14	26	
MSG-4040-10-M16	●	4	40	43	32	M16	14	26	
MSG-4042-10-M16	●	4	42	43	32	M16	14	26	

Screw	Torque(N.m)	Wrench
TSW-3509H	3.0	A-15T

SKG/MSG10 TYPE

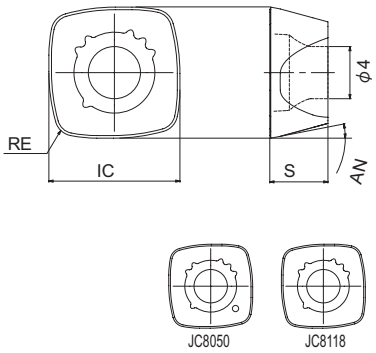
Insert



Fig. 1



Fig. 2



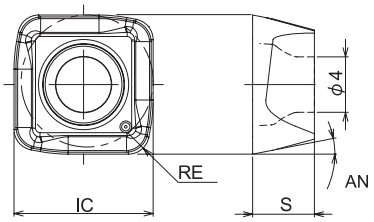
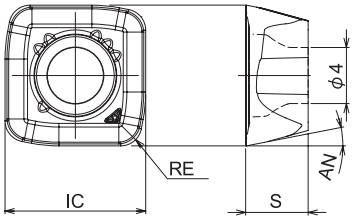


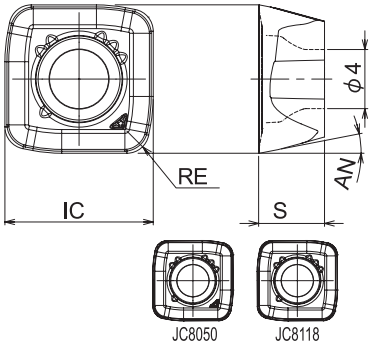


Fig. 3



Fig. 4



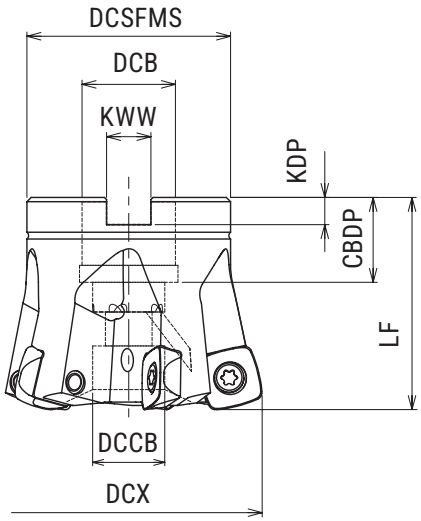


Cat.No.	Tolerance	PVD Coating				Dimensions (mm)				Fig.
		DS150	JC7550	JC8050	JC8118	RE	IC	S	AN	
SPNW100415ZTR	N			●	●	1.5	10	4.46	11°	1
SPET100415ZPER-SM	E	●	●			1.5	10	4.46	11°	2
SPMT100415ZPER-SM	M	●	●			1.5	10	4.46	11°	3
SPMT100415ZPTR-PM	M			●	●	1.5	10	4.46	11°	4

Through coolant hole | G - Body | Face Milling | Copy Milling | Pocket Milling | Helical Interpolation | Plunge Milling

SKG14 TYPE Bore Type





Cat.No.	Stock	No. of inserts	Dimensions (mm)								Arbor set bolt	Weight (kg)	Inserts
			DCX	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP			
SKG-4050R-14-22	●	4	50	50	40	22	14	10.4	6.3	19.05	M10X1.5X35★	0.3	SPNW14.. SPMT14..
SKG-4052R-14-22	●	4	52	50	42	22	17	10.4	6.3	19.05	M10X1.5X35★	0.3	
SKG-4063R-14-22	●	4	63	50	48	22	17	10.4	6.3	20	M10	0.5	
SKG-4063R-14-27	●	4	63	50	48	27	20	12.4	7	22	M12X1.75X35★	0.5	
SKG-5066R-14-27	●	5	66	50	50	27	20	12.4	7	22	M12X1.75X35★	0.5	
SKG-5080R-14-27	●	5	80	50	60	27	37	12.4	7	22	M12X1.75X35★	0.8	
SKG-6100R-14-32	●	6	100	63	70	32	45	14.4	8	25	M16	1.6	

Screw	Torque(N.m)	Wrench
CSW-513H	5.5	A-20

SKG14 TYPE Insert

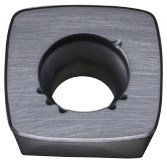


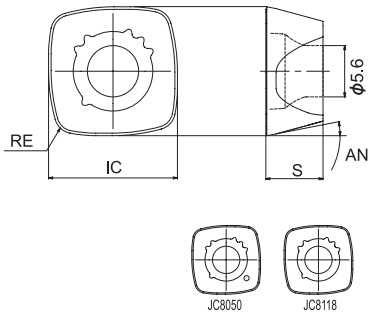
Fig. 1

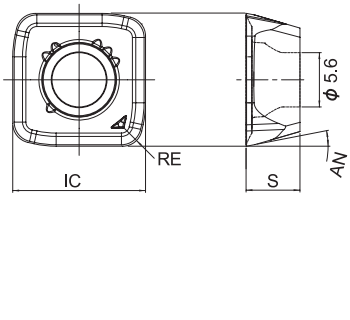


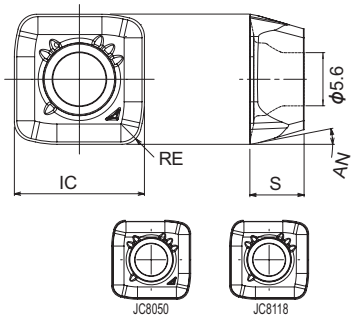
Fig. 2



Fig. 3



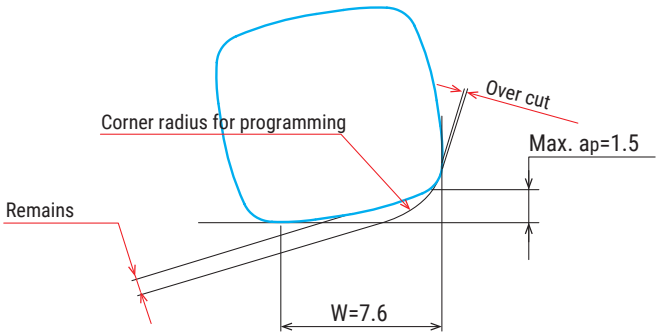




Cat.No.	Tolerance	PVD Coating				Dimensions (mm)				Fig.
		DS150	JC7550	JC8050	JC8118	RE	IC	S	AN	
SPNW140515ZTR	N			●	●	1.5	13.7	5.56	11°	1
SPMT140520ZPER-SM	M	●	●			2	13.7	5.56	11°	2
SPMT140520ZPTR-PM	M			●	●	2	13.7	5.56	11°	3

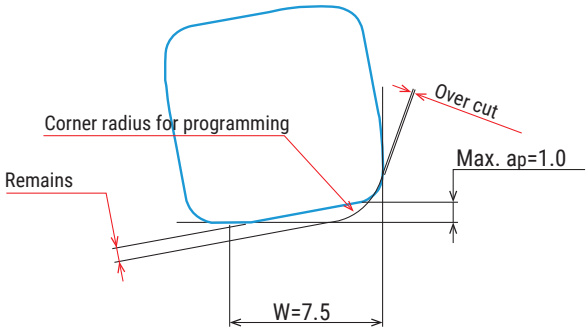
■ Definition of corner shape for programming

● **SPNW100415ZTR**



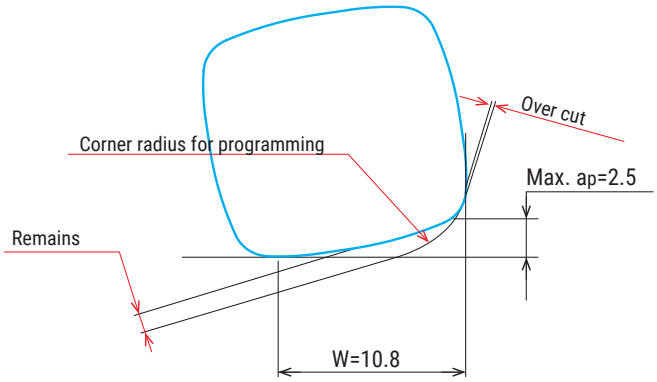
Corner radius for programming	Over cut	Remains
R2.5	0	0.99
R3.0 (Standard)	0	0.84
R3.5	0.09	0.71
R4.0	0.23	0.59

● **SPE(M)T100415ZPER-SM**
SPMT100415ZPTR-PM



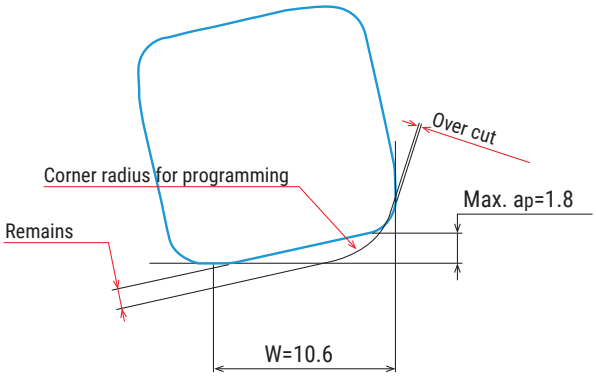
Corner radius for programming	Over cut	Remains
R2.5 (Standard)	0	0.77
R3.0	0.09	0.68
R3.5	0.25	0.60
R4.0	0.43	0.52

● **SPNW140515ZTR**



Corner radius for programming	Over cut	Remains
R3.5	0	1.60
R4.0 (Standard)	0	1.46
R4.5	0.06	1.32
R5.0	0.17	1.19

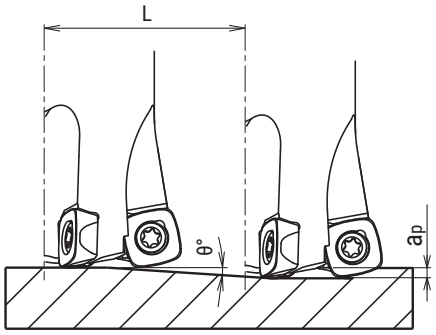
● **SPMT140520ZPER-SM**
SPMT140520ZPTR-PM



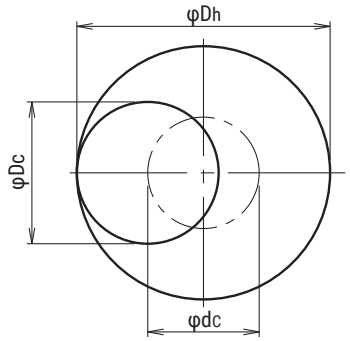
Corner radius for programming	Over cut	Remains
R3.5 (Standard)	0	1.35
R4.0	0.02	1.25
R4.5	0.14	1.12
R5.0	0.29	1.05

■ Recommended Data for Profile Milling

Ramping



Helical interpolation



● Calculation of tool pass dia.

$$\varphi dc = \varphi Dh - \varphi Dc$$

Tool pass dia. Bore dia. Tool Dia.

● Depth of cut per one circuit should not exceed max. depth of cut Ap

● Down cutting is recommended, tool pass rotation should be counterclockwise

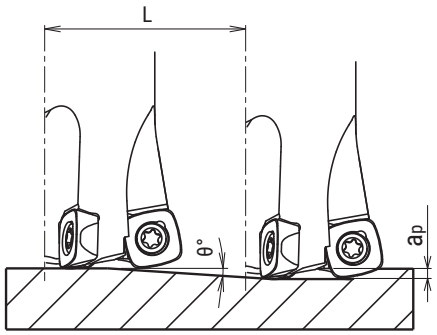
● In case of ramping and helical interpolation, apply 70% or less feed (Vf) from standard cutting condition table.

● SPNW100415ZTR / SPNW140515ZTR

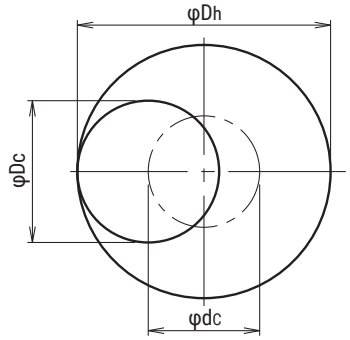
Cat.No.	Tool dia. (mm)	Effective Cutting dia. (mm)	Max. depth of cut: ap (mm)	Ramping		Helical interpolation	
				Max. ramping angle θ	Total cutting length at Max. (ap): L (mm)	Min. Bore dia. Dh min. (mm)	Max. Bore dia. Dh max. (mm)
MSG-2025-10	25	9.8	1.5	1°	85.9	36	48
MSG-3032-10	32	16.8	1.5	1°	85.9	50	62
MSG-3035-10	35	19.8	1.5	1°	85.9	56	70
MSG-4040-10	40	24.8	1.5	1°	85.9	66	78
MSG-4042-10	42	26.8	1.5	1°	85.9	70	82
SKG-*050R-10	50	34.8	1.5	1°	85.9	86	98
SKG-5052R-10	52	36.8	1.5	1°	85.9	90	102
SKG-*063R-10	63	47.8	1.5	0°45'	114.6	112	124
SKG-6066R-10	66	50.8	1.5	0°45'	114.6	118	130
SKG-6080R-10	80	64.8	1.5	0°30'	171.9	146	158
SKG-4050R-14	50	28.4	2.5	1°	143.2	80	98
SKG-4052R-14	52	30.4	2.5	1°	143.2	84	102
SKG-*063R-14	63	41.4	2.5	0°45'	191	106	124
SKG-5066R-14	66	44.4	2.5	0°45'	191	112	130
SKG-5080R-14	80	58.4	2.5	0°30'	286.5	140	158
SKG-6100R-14	100	78.4	2.5	0°20'	430	180	198
SKG-6125R-14	125	103.4	2.5	0°20'	430	230	248
SKG-7160R-14	160	138.4	2.5	0°15'	573	300	318

■ Recommended Data for Profile Milling

Ramping



Helical interpolation



● Calculation of tool pass dia.

$$\varphi dc = \varphi Dh - \varphi Dc$$

Tool pass dia. Bore dia. Tool Dia.

● Depth of cut per one circuit should not exceed max. depth of cut Ap

● Down cutting is recommended, tool pass rotation should be counterclockwise

● In case of ramping and helical interpolation, apply 70% or less feed (Vf) from standard cutting condition table.

● SPE (M) T100415ZPER-SM, SPMT100415ZPTR-PM

● SPMT140520ZPER-SM, SPMT140520ZPTR-PM

Cat.No.	Tool dia. (mm)	Effective Cutting dia. (mm)	Max. depth of cut: ap (mm)	Ramping		Helical interpolation	
				Max. ramping angle θ	Total cutting length at Max. (ap) : L (mm)	Min. Bore dia. Dh min. (mm)	Max. Bore dia. Dh max. (mm)
MSG-2025-10	25	10	1.0	1°	57.3	36	48
MSG-3032-10	32	17	1.0	1°	57.3	50	62
MSG-3035-10	35	20	1.0	1°	57.3	56	70
MSG-4040-10	40	25	1.0	1°	57.3	66	78
MSG-4042-10	42	27	1.0	1°	57.3	70	82
SKG-*050R-10	50	35	1.0	1°	57.3	86	98
SKG-5052R-10	52	37	1.0	1°	57.3	90	102
SKG-*063R-10	63	48	1.0	0°45'	76.4	112	124
SKG-6066R-10	66	51	1.0	0°45'	76.4	118	130
SKG-6080R-10	80	65	1.0	0°30'	114.6	146	158
SKG-4050R-14	50	28.8	1.8	1°	103.1	80	98
SKG-4052R-14	52	30.8	1.8	1°	103.1	84	102
SKG-*063R-14	63	41.8	1.8	0°45'	137.5	106	124
SKG-5066R-14	66	44.8	1.8	0°45'	137.5	112	130
SKG-5080R-14	80	58.8	1.8	0°30'	206.3	140	158
SKG-6100R-14	100	78.8	1.8	0°20'	206.3	180	198
SKG-6125R-14	125	123.8	1.8	0°20'	206.3	230	248
SKG-7160R-14	160	138.8	1.8	0°15'	412.5	300	318

■ Recommended Cutting Conditions | SKSGII 10

Material	Insert	Grade	*Vc* (m/min)	*fz* (mm/t)	*ap* (mm)	*ae* (mm)
Carbon Steel below 250HB	SPNW SPMT–PM	JC8050 (JC8118)	180 (130–180)	1.8 (1.4–1.8)	0.5–1.5	0.7 Dc
Tool & Die Steel below 255HB	SPNW SPMT–PM	JC8050 (JC8118)	180 (130–180)	1.8 (1.4–1.8)	0.5–1.5	0.7 Dc
Mold Steel 30–36HRC	SPNW SPMT–PM	JC8050 (JC8118)	180 (130–180)	1.8 (1.4–1.8)	0.5–1.5	0.7 Dc
Mold Steel 38–43HRC	SPNW SPMT–PM	JC8118 (JC8050)	110 (80–110)	1.5 (1.2–1.5)	0.5–1.2	0.6 Dc
Hardened Die Steel 42–52HRC	SPNW	JC8118	100	1.4 (1.0–1.4)	0.3–1.0	0.5 Dc
Grey & Nodular Cast Iron	SPNW SPMT–PM	JC8118	180 (160–180)	1.5 (1.5–1.8)	0.5–1.5	0.7 Dc
Stainless Steel	SPMT–SM SPET–SM	JC7550	150 (100–150)	1.4 (0.9–1.4)	0.5–1.0	0.6 Dc
Titanium Alloy	SPMT–SM SPET–SM	DS150	60	0.6 (0.4–0.6)	0.4–1.0	0.6 Dc

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity. (the above table is guide for cutting on a BT50 machine.)
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use air blow.
★ap ≦1.0 when using SPMT/SPET insert.

■ Recommended Cutting Conditions | SKSGII 14

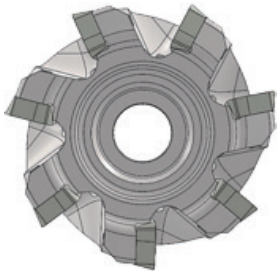
Material	Insert	Grade	*Vc* (m/min)	*fz* (mm/t)	*ap* (mm)	*ae* (mm)
Carbon Steel below 250HB	SPNW SPMT–PM	JC8050 (JC8118)	150 (100–150)	108 (1.4–1.8)	0.6–2.0	0.7 Dc
Tool & Die Steel below 255HB	SPNW SPMT–PM	JC8050 (JC8118)	150 (100–150)	1.8 (1.4–1.8)	0.6–2.0	0.7 Dc
Mold Steel 30–36HRC	SPNW SPMT–PM	JC8050 (JC8118)	150 (100–150)	1.8 (1.4–1.8)	0.6–2.0	0.7 Dc
Mold Steel 38–43HRC	SPNW SPMT–PM	JC8118 (JC8050)	100 (80–100)	1.5 (1.4–1.5)	0.7–1.6	0.6 Dc
Hardened Die Steel 42–52HRC	SPNW	JC8118	90 (70–90)	1.2 (0.7–1.2)	0.5–1.0	0.5 Dc
Grey & Nodular Cast Iron	SPNW SPMT–PM	JC8118	180 (160–180)	1.8 (1.4–1.8)	0.6–2.0	0.7 Dc
Stainless Steel	SPMT–SM	JC7550	150 (100–150)	1.3 (1.0–1.3)	0.7–1.5	0.6 Dc
Titanium Alloy	SPMT–SM	DS150	60	0.6 (0.4–0.6)	0.7–1.3	0.6 Dc

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity. (the above table is guide for cutting on a BT50 machine.)
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use air blow.
★ap ≦1.8 when using SPMT insert.

Specifically designed for high-efficiency machining of difficult-to-cut materials

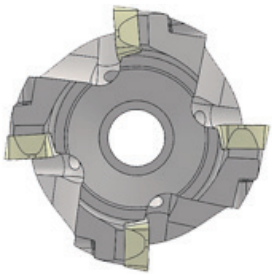
Feature 1 **Multi-edge design for high-efficiency machining.**

SKG-09 type



7 inserts
SKG-7050R-09-22

Conventional

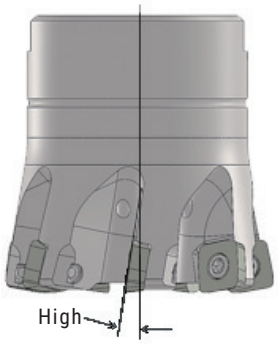


4 inserts
SKG-4050R-10-22

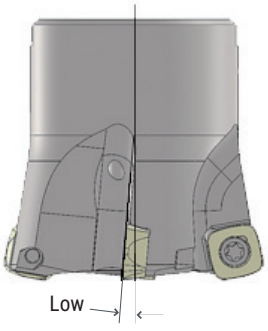
Achieved Max ap=0.9 mm even if difficult-to-cut materials such as titanium alloy , stainless steel, and heat-resistant alloy.

Feature 2 **Optimized cutting edge design for sharpness and low cutting resistance. Ideal for difficult-to-cut materials.**

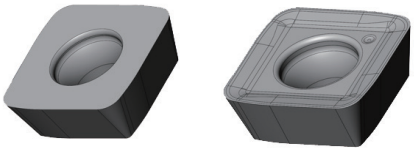
SKG-09 type



Conventional

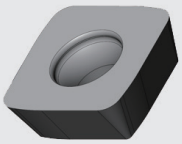


Feature 3 **Precision-ground insert with 4 cutting edges ensures excellent run-out accuracy and longer tool life.**

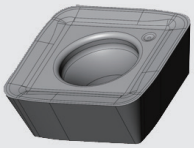


Feature 4 Insert Lineup

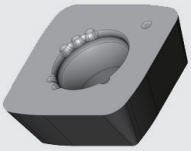
Wear resistance → Fracture resistance



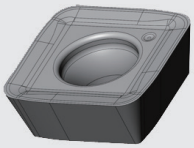
SDEW090312ZER
(JC7518/**DS217**/DS118)



SDET090312ZDER-SM
(DS118)



SDEW090312ZER
(JC7550/**DS250**/DS150)



SDET090312ZDER-SM
(JC7550/**DS250**/DS150)

● **Application**

※ SDSS (Super Duplex Stainless Steel)

Insert		Titanium alloy	Inconel	SUS630	SUS316	※ SDSS
SDEW090312ZER	(JC7518)			◎	☆	◎
SDEW090312ZER	**(JC7550)**			●	◎	●
SDEW090312ZER	(DS217)	◎	◎	◎	☆	◎
SDEW090312ZER	(DS250)			●	◎	●
SDEW090312ZER	**(DS118)**	◎				
SDEW090312ZER	(DS150)	●				
SDET090312ZDER-SM	(JC7550)			●	●	●
SDET090312ZDER-SM	(DS250)			●	●	●
SDET090312ZDER-SM	(DS150)	●				
SDET090312ZDER-SM	(DS118)	●				

◎ : First Choice ● : Unstable machining ☆ : Light load machining

Feature 5 DS2 coating

- Advanced PVD technology provides high durability and superior surface smoothness.
- New multilayer technology achieves both high hardness and strong adhesion.
- Provides excellent tool life, especially when machining stainless steel.

● Properties of DIJET PVD coating

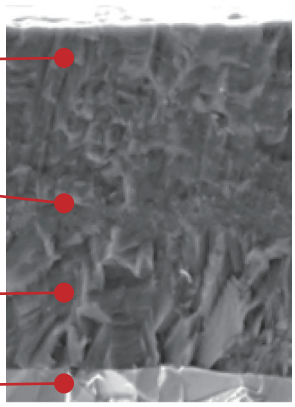
	DS2 Coating	**DS1** Coating	**JC7500** Coating
Composition	TiAlSiN	TiB_2	AlTiCrN
Hardness (GPa)	36 – 38	33 – 35	27 – 28
Oxidation temperature (℃)	1100 –1200	900 –1000	1000 –1100
Coefficient of friction (N)	0.3	0.4	0.5

Nano-composite layer
Provides high hardness and excellent wear resistance

Multilayer coating technology
Reduces cracking

Advanced Adhesion Layer
Developed with the latest PVD coating technology

Carbide substrate

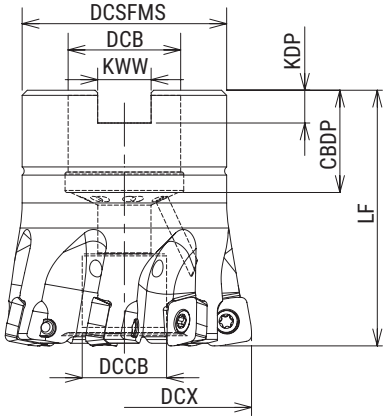


SKS-GII 09 SKG09/MSG09 Type

Through coolant hole | G - Body | Face Milling | Copy Milling | Pocket Milling | Helical Interpolation | Plunge Milling

SKG09 TYPE Bore Type



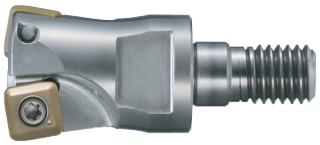


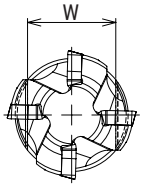
Cat.No.	Stock	No. of inserts	Dimensions (mm)								Arbor set bolt	Weight (kg)	Insert
			DCX	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP			
SKG-5040R-09-16	●	5	40	40	37	16	13.5	8.4	5.6	18	M8	0.21	SDEW090312ZER SDET090312ZDER-SM
SKG-7050R-09-22	●	7	50	50	40	22	16.5	10.4	6.3	20	M10	0.35	
SKG-7052R-09-22	●	7	52	50	40	22	16.5	10.4	6.3	20	M10	0.37	
SKG-8063R-09-22	●	8	63	50	48	22	17	10.4	6.3	20	M10	0.58	
SKG-8066R-09-27	●	8	66	50	50	27	20	12.4	7	22	M12X1.75X30★	0.60	
SKG-9080R-09-27	●	9	80	50	60	27	20	12.4	7	22	M12X1.75X30★	0.97	

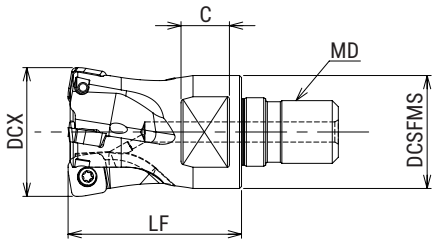
Screw	Torque(N.m)	Wrench
DSW-307H	2.1	A-10

Through coolant hole

MSG09 TYPE Modular Type







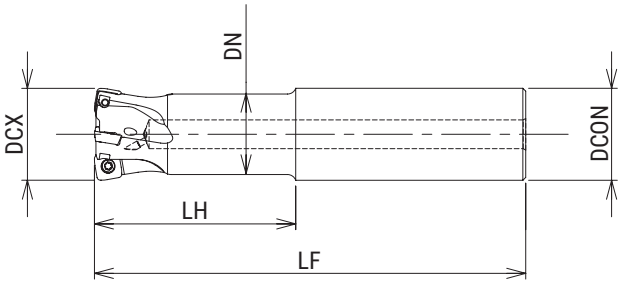
Cat.No.	Stock	No. of inserts	Dimensions (mm)						Parts	Insert
			DCX	LF	DCSFMS	MD	C	W		
MSG-2020-09-M10	●	2	20	30	19	M10	9	14	DSW-306H	SDEW090312ZER SDET090312ZDER-SM
MSG-2022-09-M10	○	2	22	30	19	M10	9	14	DSW-307H	
MSG-3025-09-M12	●	3	25	35	23	M12	11	19	DSW-307H	
MSG-4028-09-M12	○	4	28	35	23.6	M12	11	19	DSW-307H	
MSG-4032-09-M16	●	4	32	43	28	M16	12	22	DSW-307H	
MSG-5035-09-M16	●	5	35	43	29	M16	12	22	DSW-307H	
MSG-5040-09-M16	●	5	40	43	32	M16	14	26	DSW-307H	
MSG-5042-09-M16	●	5	42	43	32	M16	14	26	DSW-307H	

Screw	Torque(N.m)	Wrench
DSW-306H	1.8	A-10
DSW-307H	2.1	A-10

Through coolant hole | Face Milling | Copy Milling | Pocket Milling | Helical Interpolation

SKG09 TYPE Shank Type

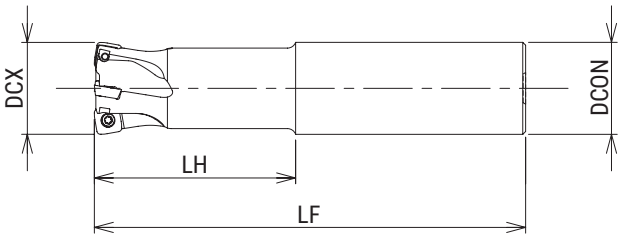




Cat.No.	Stock	No. of inserts	Dimensions (mm)					Insert
			DCX	LH	LF	DN	DCON	
SKG-3025-60-09-S25	○	3	25	60	140	23	25	SDEW090312ZER SDET090312ZDER-SM
SKG-3025-100-09-S25	○	3	25	100	180	23	25	
SKG-4032-70-09-S32	○	4	32	70	150	28	32	
SKG-4032-120-09-S32	○	4	32	120	200	28	32	
SKG-5035-70-09-S32	○	5	35	70	150	31	32	
SKG-5035-120-09-S32	○	5	35	120	200	31	32	
SKG-5040-45-09-S32	○	5	40	45	150	31.6	32	
SKG-5040-45E-09-S32	○	5	40	45	220	31.6	32	

Screw	Torque(N.m)	Wrench
DSW-307H	2.1	A-10





Cat.No.	Stock	No. of inserts	Dimensions (mm)				Insert
			DCX	LH	LF	DCON	
SKGS-3025-09-30-S25+A	*	3	25	30	100	25	SDEW090312ZER SDET090312ZDER-SM
SKGS-4032-09-35-S32+A	*	4	32	35	120	32	
SKGS-5035-09-35-S32+A	*	5	35	35	120	32	
SKGS-5040-09-35-S32+A	*	5	40	35	120	32	
SKGS-5042-09-35-S32+A	*	5	42	35	120	32	

Screw	Torque(N.m)	Wrench
DSW-307H	2.1	A-10

SKG/MSG09 TYPE Insert





Fig. 1

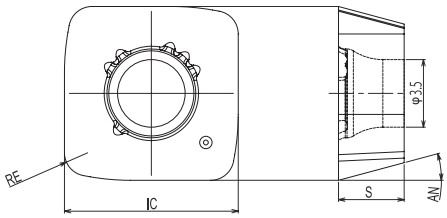
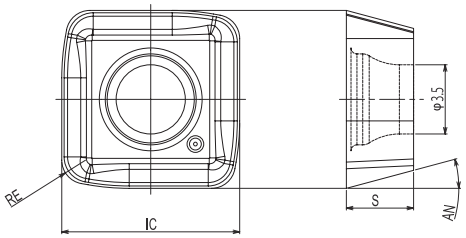
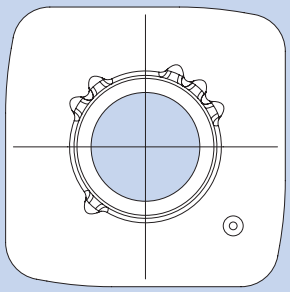


Fig. 2

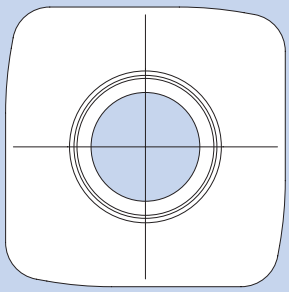


Cat.No.	Tolerance	PVD Coating						Dimensions (mm)				Fig.
		DS118	DS150	JC7518	DS217	DS250	JC7550	RE	IC	S	AN	
SDEW090312ZER	E	●	●	●	●	●	●	1.2	9	3.4	15°	1
SDET090312ZDER-SM	E	●	●			●	●	1.2	9	3.4	15°	2

GRADE MARKING



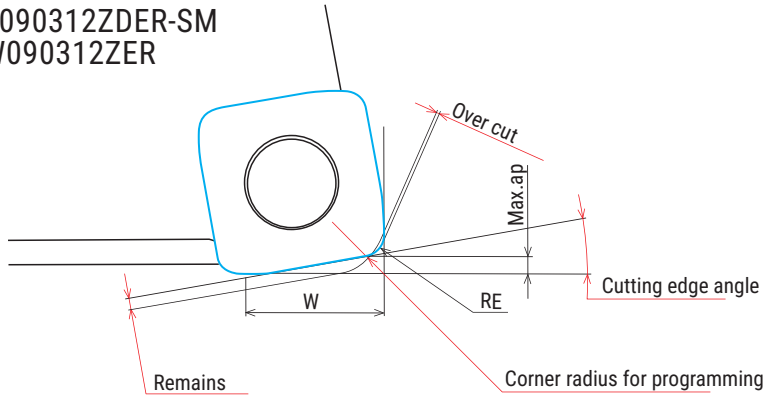
JC7550/DS250/DS150



JC7518/DS217/DS118

Definition of corner shape for programming

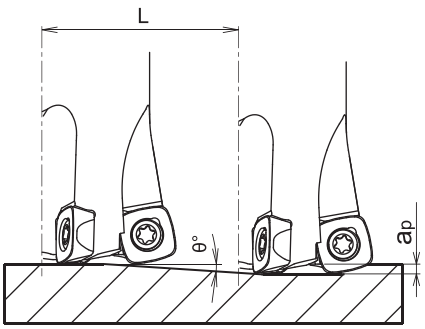
■ SDET090312ZDER-SM
SDEW090312ZER



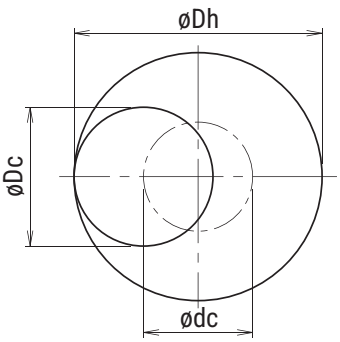
Corner radius for programming	Remains	Over cut	Max.ap	W	Cutting edge angle	Actual corner RE
1.5	0.81	0	0.9	7.1	10°	1.2
2.0 (Standard)	0.73	0				
2.5	0.65	0.08				

Recommended Data for Profile Milling

Ramping



Helical interpolation



● Calculation of tool pass dia.

$$\text{ødc (Tool pass dia.)} = \text{øDh (Bore dia.)} - \text{øDc (Tool dia.)}$$

● Depth of cut per one circuit should not exceed max. depth of cut Ap

● Down cutting is recommended, tool pass rotation should be counterclockwise

● In case of ramping and helical interpolation, apply 70% or less feed (Vf) from standard cutting condition table.

Tool dia.	Effective cutting dia.	Max.depth of cut : ap	Ramping		Helical interpolation	
			Max.ramping angle θ	Total cutting length at Max.ap : L(mm)	Min.Bore dia. (mm)	Max.Bore dia. (mm)
20	5.6	0.9	1°	51.6	27	38
22	7.7	0.9	1°	51.6	31	42
25	10.7	0.9	1°	51.6	37	48
28	13.7	0.9	1°	51.6	43	54
32	17.6	0.9	1°	51.6	51	62
35	20.6	0.9	1°	51.6	57	68
40	25.7	0.9	1°	51.6	67	78
42	27.7	0.9	1°	51.6	71	82
50	35.6	0.9	1°	51.6	87	98
52	37.6	0.9	1°	51.6	91	102
63	48.7	0.9	0°45'	68.8	113	124
66	51.7	0.9	0°45'	68.8	119	130
80	65.7	0.9	0°30'	103.1	147	158

■Recommended Cutting Conditions | SKG09 / MSG09 type

Material	Insert	Grade	*Vc* (m/min)	*fz* (mm/t)	*ap* (mm)	*ae* (mm)
Carbon Steel below 250HB	SDET09**–SM (SDEW09**)	JC7550 (JC7518)	180 (150–180)	1.2 (1.0–1.2)	0.3–0.8	0.6 Dc
Tool & Die Steel below 255HB	SDET09**–SM (SDEW09**)	JC7550 (JC7518)	150 (125–150)	1.2 (1.0–1.2)	0.3–0.8	0.6 Dc
Mold Steel 30–36HRC	SDET09**–SM (SDEW09**)	JC7550 (JC7518)	150 (125–150)	1.2 (1.0–1.2)	0.3–0.8	0.6 Dc
Austenitic Stainless Steel	SDEW09** (SDET09**–SM)	DS250 DS217	150 (125–150)	1.0 (0.8–1.0)	0.3–0.8	0.6 Dc
Martensitic Stainless Steel	SDEW09** (SDET09**–SM)	DS250 DS217	190 (155–190)	1.0 (0.8–1.0)	0.3–0.8	0.6 Dc
Precipitation Hardening Stainless Steel	SDEW09** (SDET09**–SM)	DS217 (DS250)	100 (85–100)	0.7 (0.6–0.7)	0.3–0.8	0.6 Dc
Super Duplex Stainless Steel	SDEW09** (SDET09**–SM)	DS217 DS250	70 (60–70)	0.5 (0.4–0.5)	0.3–0.8	0.4–0.6 Dc
Titanium Alloy	SDEW09** (SDET09**–SM)	DS118 (DS150)	60 (50–60)	0.6 (0.5–0.6)	0.3–0.8	0.6 Dc
Heat Resistant Alloy	SDEW09** (SDET09**–SM)	DS217 (DS250)	30 (25–30)	0.6 (0.5–0.6)	0.2–0.5	0.4–0.6 Dc

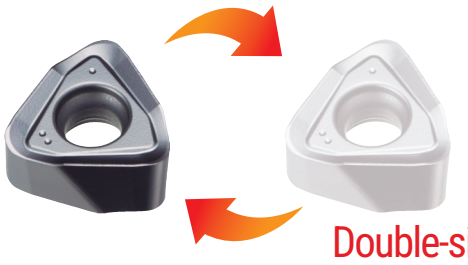
Note)

1. Please adjust cutting conditions according to machine rigidity or work rigidity.
   (the above table is guide for cutting on a BT50 machine.)
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use air blow.
5. Wet cutting is recommended for machining Super Duplex, Titanium Alloy, Heat Resistant Alloy.

High-feed milling tools with double sided inserts which achieve ultimate high-feed machining

Feature 1

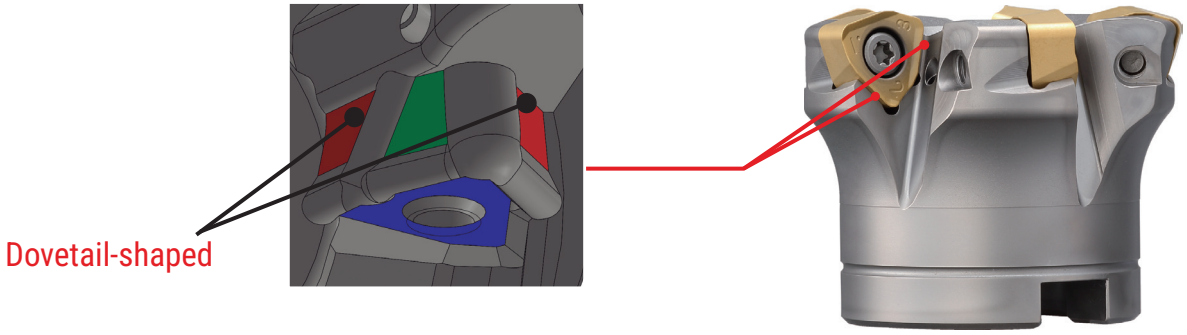
Economical double-sided insert
(with 6 cutting edges)



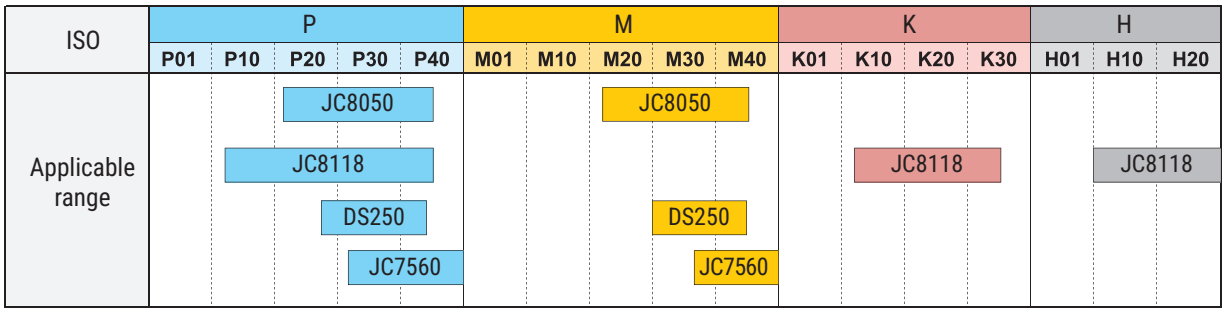
Feature 2

Strong Clamping System

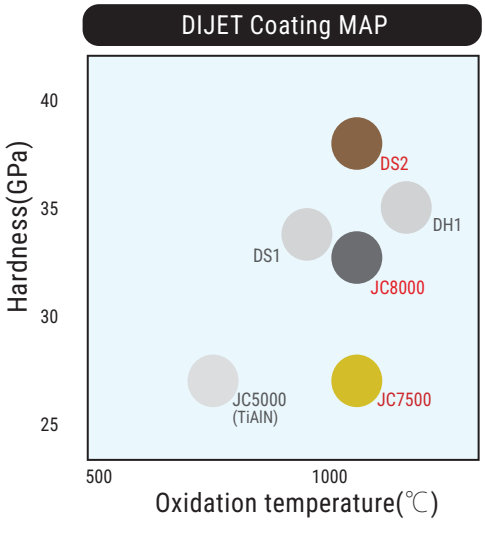
Dovetail-shaped binding faces in pocket prevents movement of inserts from the cutting force with a single screw

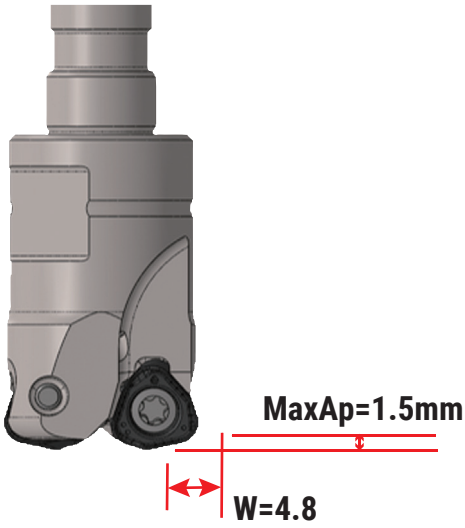


Feature 3



	DS2 Coating	JC8000 (DV Coating)	JC7500 Coating
Composition	TiAlSiN	AlTiCrN	AlTiCrN
Hardness (GPa)	36–38	32–34	27–28
Oxidation temperature (℃)	1100–1200	1000–1200	1000–1100
Coefficient of friction	0.3	0.65	0.5





EXSKS-05 type

Multi-blade specifications with small diameters result in high feed machining possibilities.

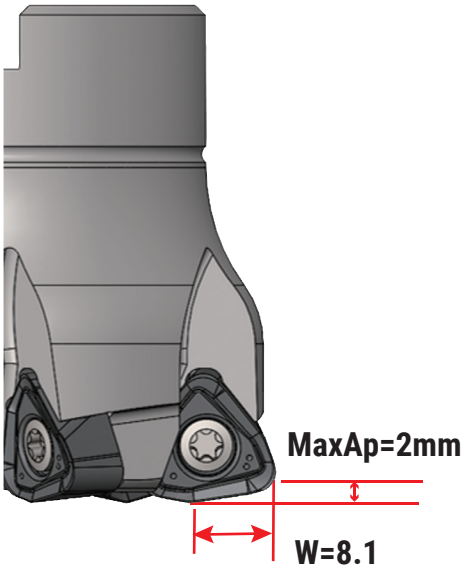
- Bore type Ø40–Ø63
- Modular type Ø20–Ø40
- Shank type Ø20–Ø33

WNMU050320ZER-PM
- For general applications
- Grade : JC8118 / JC8050



WNMU050320ZER-PL
- Low cutting force
- Sharp cutting edge
- Grade : JC8118/JC8050/DS250



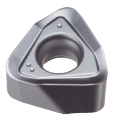


EXSKS-07 type

Specifications achieve both insert strength and sharpness allowing stable high-feed machining.

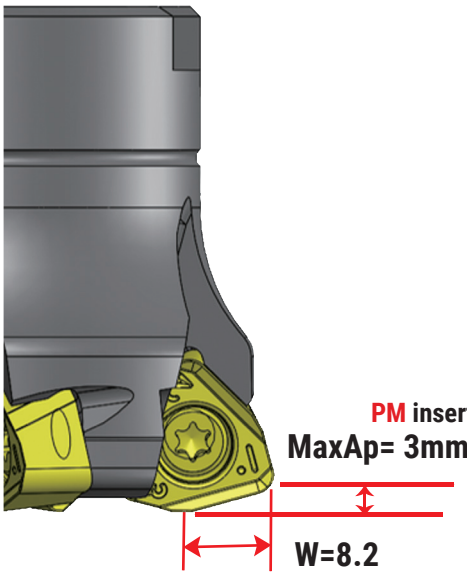
- Bore type Ø50–Ø100
- Modular type Ø32–Ø42
- Shank type Ø32–Ø40

WNMU070620ZER-PM
- For general applications
- Grade : JC8118 / JC8050



WNMU070620ZER-PL
- Low cutting force
- Sharp cutting edge
- Grade : JC8118/JC8050/DS250



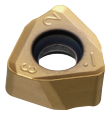


EXSKS-09 type

Larger diameters using thick high-rigid inserts can achieve high-feed machining with larger depth of cut.

- Bore type Ø50–Ø160

WNMU090720ZER-PM
- Suitable for face milling and pocket machining, with ap=1.4mm or more
- Grade : JC8118/JC8050/JC7560



WNMU090828ZER-PL
- Suitable for pocket machining with ap = 0.6 - 1.2 mm
- Optimized cutting edges reduce fluctuations during corner machining
- Grade : JC8118/JC8050

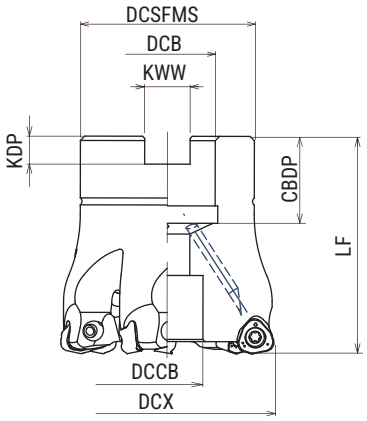


SKS EXTREME — EXSKS / MEX Type

Through coolant hole | G - Body | Face Milling | Copy Milling | Pocket Milling | Helical Interpolation | Plunge Milling

EXSKS-05 TYPE — Bore Type



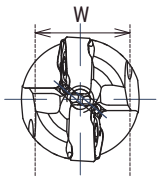


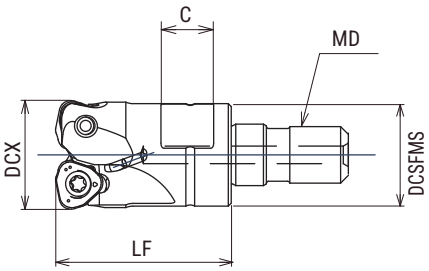
Cat.No.	Stock	No. of inserts	Dimensions (mm)								Arbor set bolt	Weight (kg)	Insert
			DCX	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP			
EXSKS-5040R-05-16	●	5	40	45	35	16	13.5	8.4	5.8	19	M8	0.25	WNMU050320ZER-PM WNMU050320ZER-PL
EXSKS-7050R-05-22	●	7	50	50	40	22	16.5	10.4	6.3	20	M10	0.39	
EXSKS-7052R-05-22	●	7	52	50	40	22	16.5	10.4	6.3	20	M10	0.41	
EXSKS-8063R-05-22	●	8	63	50	48	22	17	10.4	6.3	20	M10	0.65	

Through coolant hole | G - Body

MEX-05 TYPE — Modular Type







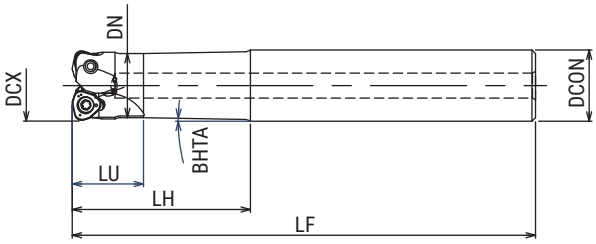
Cat.No.	Stock	No. of inserts	Dimensions (mm)						Insert
			DCX	LF	DCSFMS	MD	C	W	
MEX-2020-05-M10	●	2	20	30	18	M10	9	14	WNMU050320ZER-PM WNMU050320ZER-PL
MEX-2021-05-M10	○	2	21	30	18	M10	9	14	
MEX-2025-05-M12	●	2	25	35	23	M12	11	19	
MEX-3025-05-M12	●	3	25	35	23	M12	11	19	
MEX-3026-05-M12	○	3	26	35	23	M12	11	19	
MEX-3028-05-M12	○	3	28	28	23	M12	11	19	
MEX-4030-05-M16	○	4	30	43	27	M16	12	22	
MEX-3032-05-M16	●	3	32	43	29	M16	12	22	
MEX-4032-05-M16	●	4	32	43	29	M16	12	22	
MEX-4033-05-M16	○	4	33	43	29	M16	12	22	
MEX-4035-05-M16	●	4	35	43	29	M16	12	22	
MEX-5040-05-M16	●	5	40	43	32	M16	14	26	

Screw	Torque(N.m)	Wrench
TSW-307H	2.1	A-10

Through coolant hole

EXSKS-05 TYPE Shank Type





Cat.No.	Stock	No. of inserts	Dimensions (mm)							Inserts
			DCX	LU	LH	LF	DN	BHTA	DCON	
EXSKS-2020-05-50-S20	●	2	20	20	50	130	18	1°	20	WNMU050320ZER-PM WNMU050320ZER-PL
EXSKS-2020-05-80-S20	○	2	20	20	80	160	18	0.5°	20	
EXSKS-2021-05-50-S20	○	2	21	20	50	130	18	1°	20	
EXSKS-2021-05-80-S20	○	2	21	20	80	160	18	0.5°	20	
EXSKS-3025-05-60-S25	●	3	25	25	60	140	23	1°	25	
EXSKS-3025-05-100-S25	○	3	25	25	100	180	23	0.5°	25	
EXSKS-3026-05-60-S25	○	3	26	25	60	140	23	1°	25	
EXSKS-3026-05-100-S25	○	3	26	25	100	180	23	0.5°	25	
EXSKS-4032-05-70-S32	●	4	32	30	70	150	29	1.5°	32	
EXSKS-4032-05-120-S32	○	4	32	30	120	200	29	0.5°	32	
EXSKS-4033-05-70-S32	○	4	33	30	70	150	29	1.5°	32	
EXSKS-4033-05-120-S32	○	4	33	30	120	200	29	0.5°	32	

Screw	Torque(N.m)	Wrench
TSW-307H	2.1	A-10

Insert

Fig.1

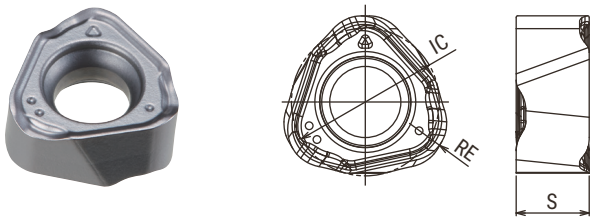
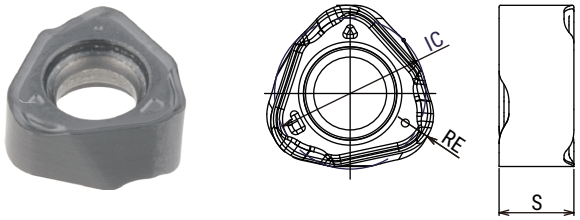
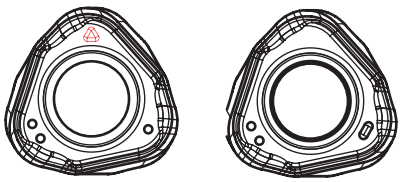


Fig.2



Cat.No.	Tolerance	PVD coated			Dimensions (mm)			Fig.
		JC8118	JC8050	DS250	RE	IC	S	
WNMU050320ZER-PM	M	●	●		2	7.7	3.9	1
WNMU050320ZER-PL	M	●	●	●	2	7.7	3.9	2

GRADE MARKING



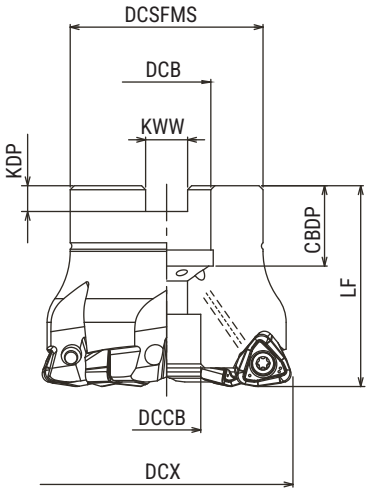
JC8050/DS250 JC8118

SKS EXTREME — EXSKS / MEX Type

Through coolant hole | G - Body | Face Milling | Copy Milling | Pocket Milling | Helical Interpolation | Plunge Milling

EXSKS-07 TYPE — Bore Type





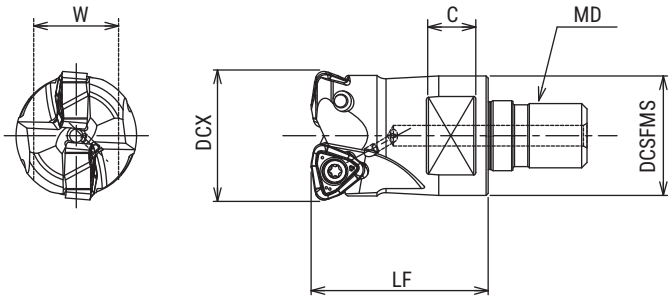
Cat.No.	Stock	No. of inserts	Dimensions (mm)								Arbor set bolt	Weight (kg)	Insert
			DCX	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP			
EXSKS-5050R-07-22	●	5	50	50	40	22	16.5	10.4	6.3	20	M10	0.38	WNMU070620ZER-PM WNMU070620ZER-PL
EXSKS-5052R-07-22	●	5	52	50	40	22	16.5	10.4	6.3	20	M10	0.40	
EXSKS-6063R-07-22	●	6	63	50	48	22	17	10.4	6.3	20	M10	0.64	
EXSKS-6066R-07-27+A	●	6	66	50	48	27	20	12.4	7	22	M12X1.75X35★	0.64	
EXSKS-7080R-07-27	●	7	80	55	65	27	20	12.4	7	22	M12X1.75X35★	1.23	
EXSKS-8100R-07-32	●	8	100	50	85	32	26	14.4	8	25	M16X2X25★	1.76	

Screw	Torque(N.m)	Wrench
TSW-410H	3.5	A-15T

Through coolant hole | G - Body

MEX-07 TYPE — Modular Type





Cat.No.	Stock	No. of inserts	Dimensions (mm)						Insert
			DCX	LF	DCSFMS	MD	C	W	
MEX-2032-07-M16	●	2	32	43	29	M16	12	22	WNMU070620ZER-PM WNMU070620ZER-PL
MEX-3035-07-M16	●	3	35	43	29	M16	12	22	
MEX-4040-07-M16	●	4	40	43	32	M16	14	26	
MEX-4042-07-M16	●	4	42	43	32	M16	14	26	

Screw	Torque(N.m)	Wrench
TSW-410H	3.5	A-15

Through coolant hole

EXSKS-07 TYPE Shank Type



Fig.1 DCX=Ø32

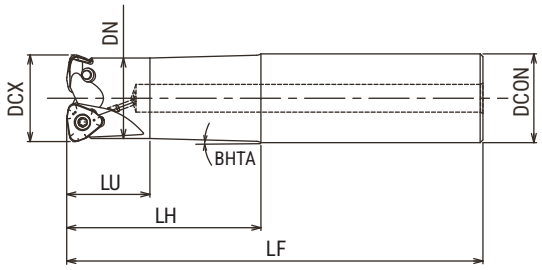
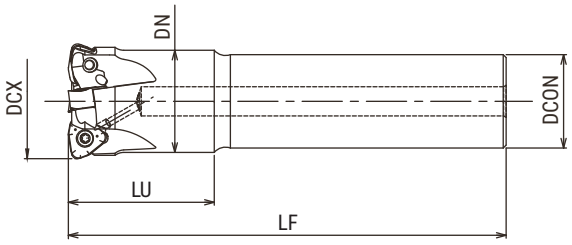


Fig.2 DCX=Ø35, 40



Cat.No.	Stock	No. of inserts	Dimensions (mm)							Fig.	Insert
			DCX	LU	LH	LF	DN	BHTA	DCON		
EXSKS-2032-07-70-S32	○	2	32	30	70	150	29	1.5°	32	1	WNMU070620ZER-PM WNMU070620ZER-PL
EXSKS-2032-07-120-S32	○	2	32	30	120	200	29	0.6°	32	1	
EXSKS-3035-07-40-S32	○	3	35	40	–	150	31	–	32	2	
EXSKS-3035-07-40L-S32	○	3	35	40	–	200	31	–	32	2	
EXSKS-4040-07-50-S32	○	4	40	50	–	150	35	–	32	2	
EXSKS-4040-07-50L-S32	○	4	40	50	–	200	35	–	32	2	

Screw	Torque(N.m)	Wrench
TSW-410H	3.5	A-15

Insert

Fig.1

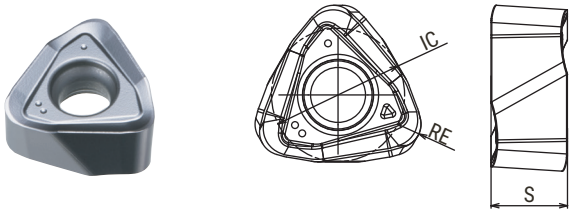
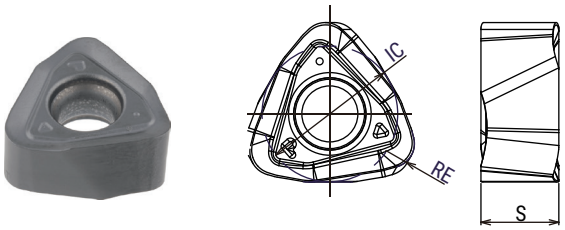
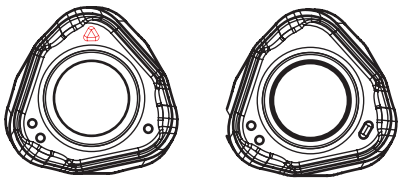


Fig.2



Cat.No.	Tolerance	PVD coated			Dimensions (mm)			Fig.
		JC8118	JC8050	DS250	RE	IC	S	
WNMU070620ZER-PM	M	●	●		2	11.2	6.4	1
WNMU070620ZER-PL	M	●	●	●	2	11.2	6.4	2

GRADE MARKING



JC8050/DS250 JC8118

SKS EXTREME — EXSKS / MEX Type

EXSKS-09 TYPE — Bore Type

G - Body | Face Milling | Copy Milling | Pocket Milling | Helical Interpolation | Plunge Milling



Fig.1
Through coolant hole

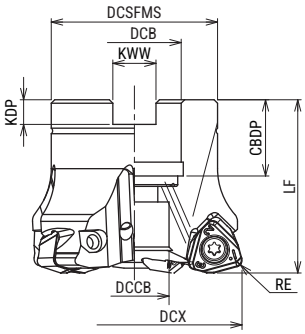


Fig.2
Without coolant hole

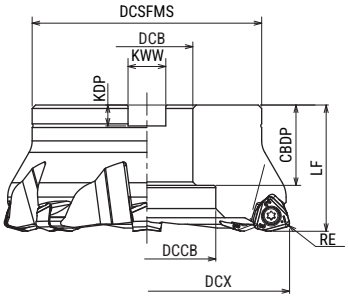
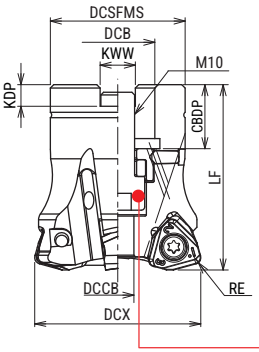


Fig.3
Through coolant hole



Set bolt built into the cutter body

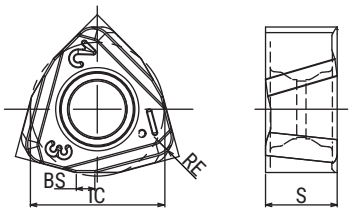
Cat.No.	Stock	No. of inserts	Dimensions (mm)								Arbor set bolt	Weight (kg)	Fig.	Inserts
			DCX	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP				
EXSKS-3050R-22	○	3	50	55	40	22	9.6	10.4	6.3	19	M10×1.5×25	0.4	3	WNMU090720ZER-PM WNMU090828ZER-PL
EXSKS-4050R-22	●	4	50	55	40	22	9.6	10.4	6.3	19	M10×1.5×25	0.3	3	
EXSKS-4052R-22	●	4	52	50	40	22	17	10.4	6.3	20	M10	0.4	1	
EXSKS-4063R-22	○	4	63	50	48	22	17	10.4	6.3	20	M10	0.5	1	
EXSKS-5063R-22	●	5	63	50	48	22	17	10.4	6.3	20	M10	0.5	1	
EXSKS-5063R-27	●	5	63	50	48	27	20	12.4	7	22	M12×1.75×30	0.5	1	
EXSKS-5066R-27	●	5	66	50	48	27	20	12.4	7	22	M12×1.75×30	0.5	1	
EXSKS-6080R-27	●	6	80	55	65	27	37	12.4	7	22	M12×1.75×40	0.9	1	
EXSKS-7100R-32	●	7	100	70	85	32	26	14.4	8	32	M16×2×45	1.9	1	
EXSKS-8125R-40	●	8	125	70	100	40	32	16.4	9	35	M20×2.5×45	3.9	1	
EXSKS-9160R-40	●	9	160	55	100	40	85	16.4	9	35	M20	3.9	2	

Screw	Torque(N.m)	Wrench
CSW-513H	5.5	A-20

Insert

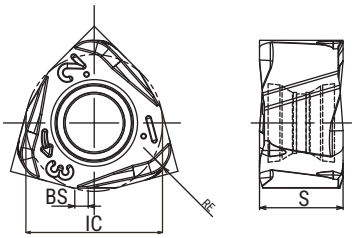
WNMU090720ZER-PM





WNMU090828ZER-PL





Cat.No.	Tolerance	PVD coated			Dimensions (mm)			
		JC8118	JC8050	JC7560	IC	S	BS	RE
WNMU090720ZER-PM	M	●	●	●	14	7.66	1.94	2
WNMU090828ZER-PL	M	●	●		13.91	8.66	1.37	2.8

Note) When using PL inserts, tool dia. will be smaller than PM insert.
In case dia. Ø100 holder, tool dia.is 0.06mm smaller.
In case dia. Ø125 holder, tool dia.is 0.11mm smaller.
In case dia. Ø160 holder, tool dia.is 0.15mm smaller

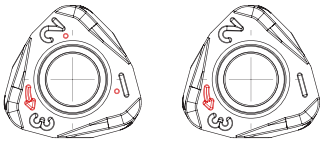
GRADE MARKING

WNMU090720ZER-PM



JC8050 JC8118 JC7560

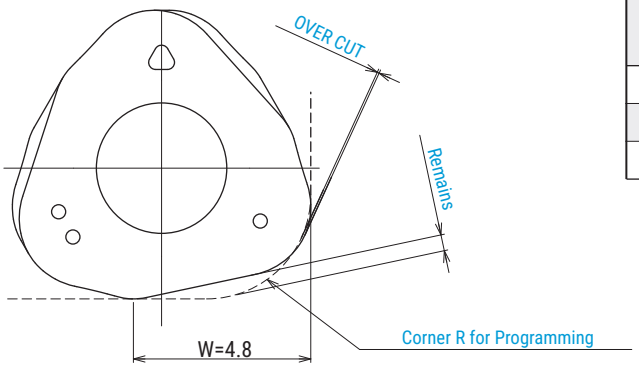
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JC8050 JC8118

EXSKS-05 TYPE

Definition of corner shape for programming

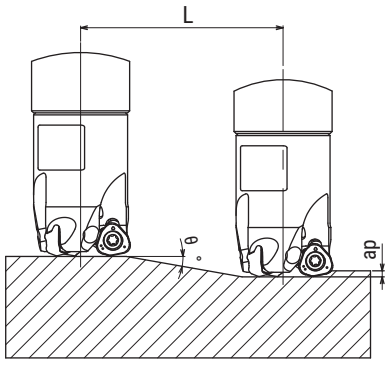


Corner radius for programming	Remains	Over cut
R2.0	0.59	0
R2.5 (Std.)	0.5	0
R3.0	0.41	0.13

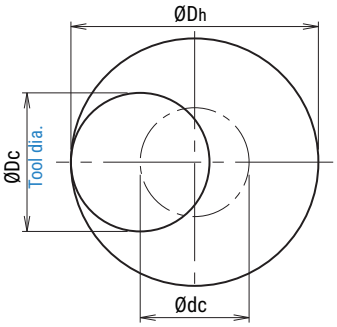
(mm)

Attention for profile milling

Ramping



Helical interpolation



- Calculation of tool pass dia.

$$Ødc = ØDh - ØDc$$

Tool pass dia. Bore dia. Tool dia.

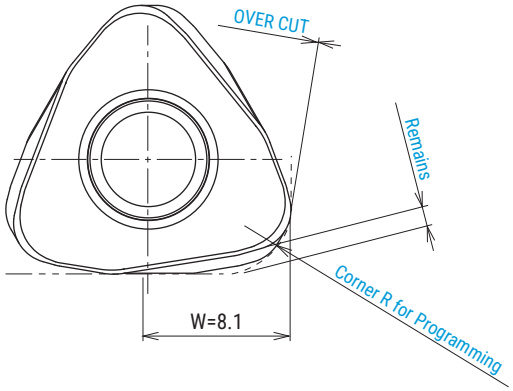
- Depth of cut per one circuit should not exceed max. depth of cut ap.
- Down cutting is recommended, so tool pass rotation should be counterclockwise.
- To obtain a flat bottom surface when helical milling, it requires to remove "the uncut part" in the center of the work material at a final pass.

◎ In case of ramping and helical interpolation, apply 70% or less feed speed from standard cutting condition table.
◎ In case of drilling,apply 50% or less Z axis feed speed from standard cutting condition table.
◎ Long consecutive chips may come out in case of drilling, confirm the safe condition suffciently.

Cat. No.	Tool dia. (mm)	EFF. Cutting dia. (mm)	Max. depth of cut (mm) ap	Ramping		Helical interpolation			Max. drilling depth Z (mm)
				Max. ramping angle θ°	Total cutting length at Max ap	Min. bore dia. Dh min (mm)	Max. bore dia. Dh min (mm)	Dh min (mm)	
EXSKS-*020/MEX-*020	20	10	1.5	2.8	31	28	36	31	0.4
EXSKS-*021/MEX-*021	21	11	1.5	2.6	34	30	38	33	0.4
EXSKS-*025/MEX-*025	25	15	1.5	1.8	48	38	46	41	0.4
EXSKS-*026/MEX-*026	26	16	1.5	1.7	51	40	48	43	0.4
MEX-*028	28	18	1.5	1.5	58	44	52	47	0.4
MEX-*030	30	20	1.5	1.3	67	48	56	51	0.4
EXSKS-*032/MEX-*032	32	22	1.5	1.2	72	52	60	55	0.4
EXSKS-*033/MEX-*033	33	23	1.5	1.1	79	54	62	57	0.4
MEX-*035	35	25	1.5	1	86	58	66	61	0.4
EXSKS-*040/MEX-*040	40	30	1.5	0.8	108	68	76	71	0.4
EXSKS-*050	50	40	1.5	0.6	144	88	96	91	0.4
EXSKS-*052	52	42	1.5	0.6	144	92	100	95	0.4
EXSKS-*063	63	53	1.5	0.5	172	114	122	117	0.4

EXSKS-07 TYPE

Definition of corner shape for programming

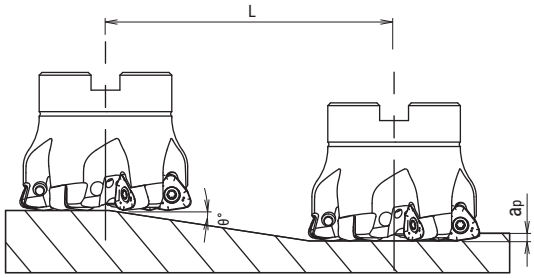


Corner radius for programming	Remains	Over cut
R3.0 (Std.)	0.8	0
R3.5	0.73	0.06
R4.0	0.66	0.21

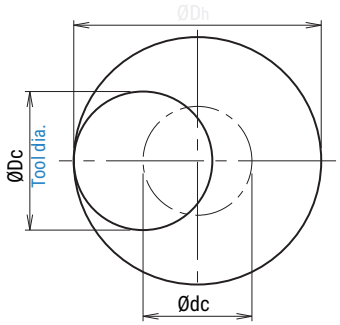
(mm)

Attention for profile milling

Ramping



Helical interpolation



- Calculation of tool pass dia.

$$Ødc = ØDh - ØDc$$

Tool pass dia. Bore dia. Tool dia.

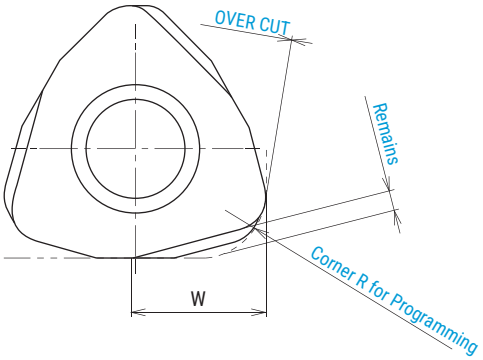
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◎ In case of drilling,apply 50% or less Z axis feed speed from standard cutting condition table.
◎ Long consecutive chips may come out in case of drilling, confirm the safe condition suffciently.

Cat. No.	Tool dia. (mm)	EFF. Cutting dia. (mm)	Max. depth of cut (mm) ap	Ramping		Helical interpolation			Max. drilling depth Z (mm)
				Max. ramping angle θ°	Total cutting length at Max ap	Min. bore dia. Dh min (mm)	Max. bore dia. Dh min (mm)	Dh min (mm)	
EXSKS-*032/MEX-*032	32	15	2	2.2	53	41	60	48	0.5
EXSKS-*035/MEX-*035	35	18	2	2.1	55	47	66	54	0.5
EXSKS-*040/MEX-*040	40	23	2	2	58	57	76	64	0.5
MEX-*042	42	25	2	1.8	64	61	80	68	0.5
EXSKS-*050	50	33	2	1.5	77	77	96	84	0.5
EXSKS-*052	52	35	2	1.2	96	81	100	88	0.5
EXSKS-*063	63	46	2	1	115	103	122	110	0.5
EXSKS-*080	80	63	2	0.8	144	137	156	144	0.5
EXSKS-*100	100	83	2	0.5	230	178	198	183	0.6

EXSKS-09 TYPE

Definition of corner shape for programming

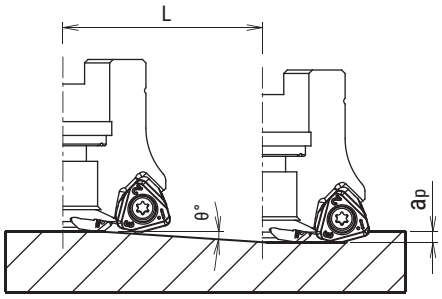


Insert	W	Corner radius for programming	Remains	Over cut
WNMU090720ZER-PM	8.2	R3.0	1.41	0
		R3.5	1.30	0
		R4.0	1.19	0.025

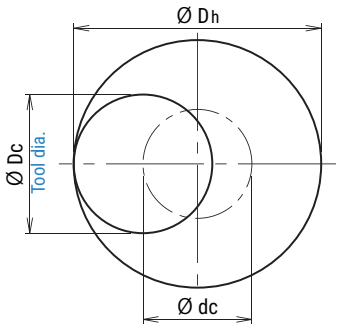
Insert	W	Corner radius for programming	Remains	Over cut
WNMU090828ZER-PL	8.4	R3.0	1.18	0
		R3.5	1.06	0
		R4.0	0.95	0.010

Attention for profile milling

Ramping



Helical interpolation



- Calculation of tool pass dia.

$$Ødc = ØDh - ØDc$$

Ødc: Tool pass dia. ØDh: Bore dia. ØDc: Tool dia.

- Depth of cut per one circuit should not exceed max. depth of cut ap.
- Down cutting is recommended, so tool pass rotation should be counterclockwise.
- To obtain a flat bottom surface when helical milling, it requires to remove "the uncut part" in the center of the work material at a final pass.

◎ In case of ramping and helical interpolation, apply 70% or less feed speed from standard cutting condition table.
◎ In case of drilling,apply 50% or less Z axis feed speed from standard cutting condition table.
◎ Long consecutive chips may come out in case of drilling, confirm the safe condition suffciently.

WNMU090720ZER-PM

Cat. No.	Tool dia. (mm)	EFF. Cutting dia. (mm)	Max. depth of cut (mm) ap	Ramping		Helical interpolation			Max. drilling depth Z (mm)
				Max. ramping angle θ°	Total cutting length at Max ap	Min. bore dia. Dh min (mm)	Max. bore dia. Dh min (mm)	Dh min (mm)	
EXSKS-*050	50	33	3	2.5	69	73	96	81	1.1
EXSKS-*052	52	35	3	2.4	72	77	100	85	1.2
EXSKS-*063	63	46	3	1.8	96	99	122	107	1.2
EXSKS-*066	66	49	3	1.7	102	105	128	113	1.2
EXSKS-*080	80	63	3	1.3	133	133	156	141	1.3
EXSKS-*100	100	83	3	1	172	173	196	181	1.3
EXSKS-*125	125	108	3	0.9	191	223	246	231	1.3
EXSKS-*160	160	143	3	0.7	246	293	316	301	1.7

WNMU090828ZER-PL

Cat. No.	Tool dia. (mm)	EFF. Cutting dia. (mm)	Max. depth of cut (mm) ap	Ramping		Helical interpolation			Max. drilling depth Z (mm)
				Max. ramping angle θ°	Total cutting length at Max ap	Min. bore dia. Dh min (mm)	Max. bore dia. Dh min (mm)	Dh min (mm)	
EXSKS-*050	50	33	2	2.3	50	74	96	82	1
EXSKS-*052	52	35	2	2.2	53	78	100	86	1
EXSKS-*063	63	46	2	1.8	64	100	122	108	1.2
EXSKS-*066	66	49	2	1.7	68	106	128	114	1.2
EXSKS-*080	80	63	2	1.3	89	134	156	142	1.3
EXSKS-*100	99.94	83	2	1	115	174	195	182	1.3
EXSKS-*125	124.89	108	2	0.9	128	224	245	232	1.4
EXSKS-*160	159.85	142	2	0.7	164	294	315	302	1.6

■ Recommended Cutting Conditions | EXSKS–05 (Bore type)

Material	Grade	*Vc* (m/min)	*fz* (mm/t)	*ap* (mm)	*ae* (mm)
Carbon Steel below 250HB	JC8050 (JC8118)	160 (120–160)	1.2 (0.8–1.2)	0.4–1.0	0.7 Dc
Tool & Die Steel below 255HB	JC8050 (JC8118)	150 (110–150)	1.2 (0.8–1.2)	0.4–1.0	0.7 Dc
Mold Steel 30–36HRC	JC8118 (JC8050)	150 (110–150)	1.2 (0.8–1.2)	0.4–1.0	0.7 Dc
Mold Steel 38–43HRC	JC8118 (JC8050)	110 (80–110)	1.0 (0.8–1.0)	0.4–0.8	0.6 Dc
Hardened Die Steel 42–52HRC	JC8118	100 (70–100)	0.8 (0.6–0.8)	0.5–0.7	0.5 Dc
Grey Cast Iron	JC8118 (JC8050)	180 (130–180)	1.4 (0.9–1.4)	0.5–1.0	0.7 Dc
Nodular Cast Iron	JC8118 (JC8050)	160 (110–160)	1.2 (0.8–1.2)	0.5–1.0	0.7 Dc
Austenitic Stainless Steel	JC8050 (DS250)	130 (90–130)	1.0 (0.8–1.0)	0.4–0.8	0.5 Dc
Martensitic Stainless Steel	JC8118 (DS250)	150 (100–150)	1.2 (1.0–1.2)	0.5–1.0	0.5 Dc

■ Recommended Cutting Conditions | MEX–05 (Modular type)

Material	Grade	*Vc* (m/min)	*fz* (mm/t)	*ap* (mm)	*ae* (mm)
Carbon Steel below 250HB	JC8050 (JC8118)	200 (160–200)	1.2 (1.0–1.2)	0.4–0.8	0.7 Dc
Tool & Die Steel below 255HB	JC8050 (JC8118)	180 (140–180)	1.2 (1.0–1.2)	0.4–0.8	0.7 Dc
Mold Steel 30–36HRC	JC8118 (JC8050)	180 (140–180)	1.2 (1.0–1.2)	0.4–0.8	0.7 Dc
Mold Steel 38–43HRC	JC8118 (JC8050)	130 (80–130)	1.0 (0.8–1.2)	0.4–0.6	0.6 Dc
Hardened Die Steel 42–52HRC	JC8118	100 (70–100)	0.8 (0.6–0.8)	0.5–0.6	0.5 Dc
Grey Cast Iron	JC8118 (JC8050)	200 (160–200)	1.4 (1.0–1.4)	0.5–1.0	0.7 Dc
Nodular Cast Iron	JC8118 (JC8050)	180 (140–180)	1.2 (1.0–1.2)	0.5–1.0	0.7 Dc
Austenitic Stainless Steel	JC8050 (DS250)	150 (110–150)	1.0 (0.8–1.0)	0.4–0.6	0.5 Dc
Martensitic Stainless Steel	JC8118 (DS250)	170 (130–170)	1.2 (1.0–1.2)	0.5–0.8	0.5 Dc

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity. (the above table is guide for cutting on a BT50 machine.)
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use air blow.

SKS EXTREME — EXSKS / MEX Type

■ Recommended Cutting Conditions | EXSKS–07 (Bore type)

Material	Grade	*Vc* (m/min)	*fz* (mm/t)	*ap* (mm)	*ae* (mm)
Carbon Steel below 250HB	JC8050	150 (120–150)	1.5 (1.1–1.5)	0.5–1.5	0.7 Dc
Tool & Die Steel below 255HB	JC8050	130 (100–130)	1.5 (1.1–1.5)	0.5–1.5	0.7 Dc
Mold Steel 30–36HRC	JC8118	130 (100–130)	1.5 (1.1–1.5)	0.5–1.5	0.7 Dc
Mold Steel 38–43HRC	JC8118	110 (80–110)	1.3 (1.0–1.3)	0.4–1.2	0.6 Dc
Hardened Die Steel 42–52HRC	JC8118	90 (70–90)	1.0 (0.8–1.0)	0.4–1.0	0.5 Dc
Grey Cast Iron	JC8118	150 (120–150)	1.5 (1.1–1.5)	0.5–2.0	0.7 Dc
Nodular Cast Iron	JC8118	130 (100–130)	1.5 (1.1–1.5)	0.5–1.5	0.7 Dc
Austenitic Stainless Steel	JC8050 (DS250)	110 (80–110)	1.3 (1.0–1.3)	0.4–1.2	0.5 Dc
Martensitic Stainless Steel	JC8118 (DS250)	130 (100–130)	1.3 (1.0–1.3)	0.5–1.5	0.5 Dc

■ Recommended Cutting Conditions | MEX–07 (Modular type)

Material	Grade	*Vc* (m/min)	*fz* (mm/t)	*ap* (mm)	*ae* (mm)
Carbon Steel below 250HB	JC8050	200 (160–200)	1.5 (1.3–1.5)	0.5–1.0	0.7 Dc
Tool & Die Steel below 255HB	JC8050	180 (140–180)	1.5 (1.3–1.5)	0.5–1.0	0.7 Dc
Mold Steel 30–36HRC	JC8118	180 (140–180)	1.5 (1.3–1.5)	0.5–1.0	0.7 Dc
Mold Steel 38–43HRC	JC8118	130 (90–130)	1.2 (1.0–1.2)	0.4–0.8	0.6 Dc
Hardened Die Steel 42–52HRC	JC8118	100 (70–100)	1.0 (0.8–1.0)	0.4–0.8	0.5 Dc
Grey Cast Iron	JC8118	200 (160–200)	1.5 (1.4–1.5)	0.5–1.5	0.7 Dc
Nodular Cast Iron	JC8118	170 (130–170)	1.5 (1.3–1.5)	0.5–1.0	0.7 Dc
Austenitic Stainless Steel	JC8050 (DS250)	150 (110–150)	1.2 (1.0–1.2)	0.4–0.8	0.5 Dc
Martensitic Stainless Steel	JC8118 (DS250)	170 (130–170)	1.2 (1.0–1.2)	0.5–1.0	0.5 Dc

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity. (the above table is guide for cutting on a BT50 machine.)
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use air blow.

■ Recommended Cutting Conditions | EXSKS–09 (Bore type)

Material	Grade	*Vc* (m/min)	*fz* (mm/t)	*ap* (mm)	*ae* (mm)
Carbon Steel below 250HB	JC7560 JC8050 (JC8118)	150 (100–150)	2.0 (1.0–2.0)	0.4–2.0	0.7 Dc
Tool & Die Steel below 255HB	JC7560 JC8050 (JC8118)	150 (100–150)	2.0 (1.0–2.0)	0.4–2.0	0.7 Dc
Mold Steel 30–36HRC	JC7560 JC8050 (JC8118)	130 (90–130)	2.0 (1.0–2.0)	0.4–2.0	0.7 Dc
Mold Steel 38–43HRC	JC8118 (JC8050)	110 (70–110)	1.0 (0.5–1.0)	0.4–1.5	0.6 Dc
Hardened Die Steel 42–52HRC	JC8118	80 (60–80)	1.0 (0.5–1.0)	0.4–1.5	0.5 Dc
Grey Cast Iron	JC8118	190 (100–190)	2.0 (1.0–2.0)	0.4–2.5	0.7 Dc
Nodular Cast Iron	JC8118	190 (100–190)	2.0 (1.0–2.0)	0.4–2.5	0.7 Dc
Stainless Steel	JC8050 (JC7560)	150 (100–150)	1.5 (1.0–1.5)	0.4–2.0	0.5 Dc

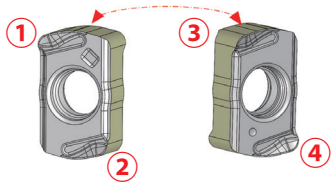
Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity. (the above table is guide for cutting on a BT50 machine.)
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use air blow.

High-Feed Milling Cutter
Multi-Blade Design with Double-Sided Compact Inserts for High Productivity

Feature 1

Lineup from Ø10, featuring economical double-sided inserts with four cutting edges.

1. Economical Double-Sided Inserts



2. Lineup from Ø10 — Insert size 07

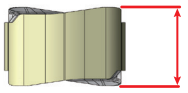


- ✓ Tool diameter **Ø10**–Ø16 mm
- ✓ Max. depth of cut: **0.5 mm**
- ✓ **Modular type**: Ø10–Ø16 mm
  Shank type: Ø10–Ø14 mm

Feature 2

High-Rigidity Design for Stable, Reliable Machining.

1. Increased insert rigidity



Insert thickness increased by 14%

NEW **MXG07**
ENMU07...



MPM
EOMT06...



2. M2 Fine-Pitch Screw

Fine-pitch
M2 screw



NEW **MXG07**

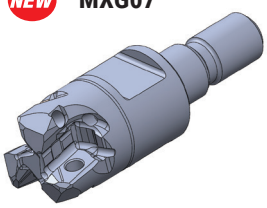
Coarse-pitch
M1.8 screw



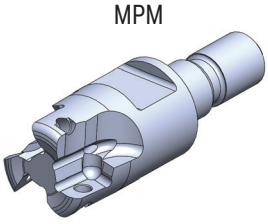
MPM
(Conventional model)

3. High-Rigidity Body Design

NEW **MXG07**



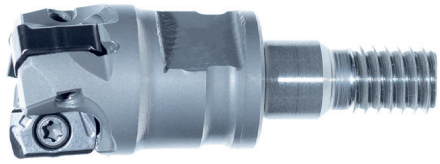
MPM

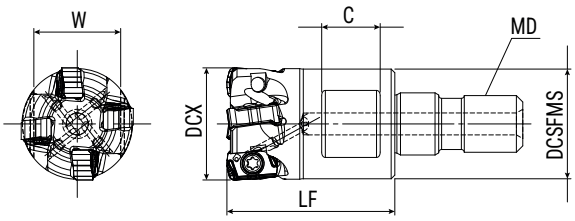


Body rigidity improved by 44%

Through coolant hole | Face Milling | Copy Milling | Pocket Milling | Helical Interpolation | Slotting

MXG07 TYPE Modular Type

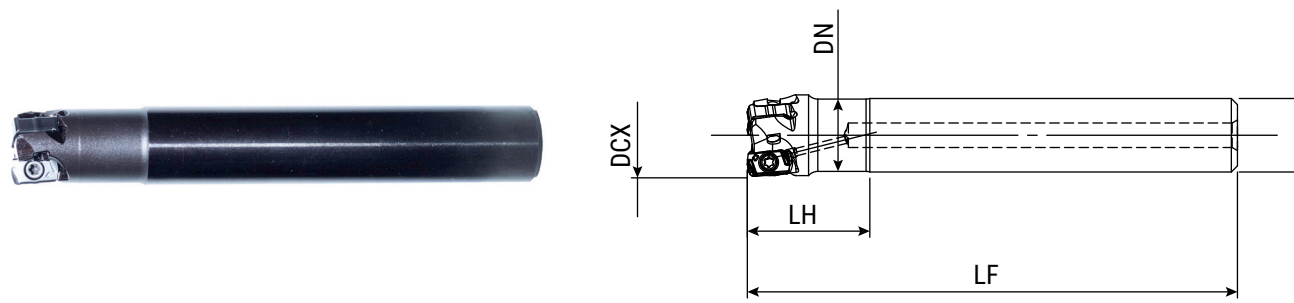




Cat.No.	Stock	No. of inserts	Dimensions (mm)						Insert
			DCX	LF	DCSFMS	MD	C	W	
MXG-2010-07-M6	●	2	10	18	9.5	M6	6.5	8	ENMU07T207ZER-PM
MXG-3012-07-M6	●	3	12	20	11.2	M6	6.5	8	
MXG-3013-07-M6	●	3	13	20	11.2	M6	6.5	8	
MXG-4016-07-M8	●	4	16	23	15	M8	8	12	

Screw	Torque(N.m)	Wrench
TSW-2044H	0.5	A-06

GMX07 TYPE Shank Type



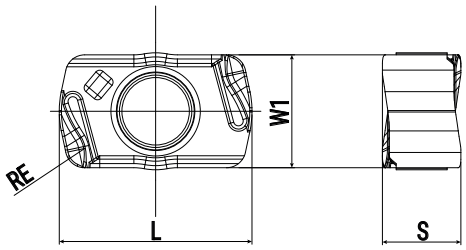
Type	Cat.No.	Stock	No. of inserts	Dimensions (mm)					Insert
				DCX	LH	LF	DN	DCON	
Standard	GMX2010-07-20-S10+A	●	2	10	20	80	9.2	10	ENMU07T207ZER-PM
	GMX3012-07-20-S12+A	●	3	12	20	80	11.2	12	
	GMX3014-07-20-S12+A	●	3	14	20	80	11.8	12	
Long shank	GMX2011-07-20-S10-LS+A	●	2	11	20	120	9.6	10	
	GMX3013-07-20-S12-LS+A	●	3	13	20	120	11.6	12	
	GMX3014-07-20-S12-LS+A	●	3	14	20	120	11.8	12	

Screw	Torque(N.m)	Wrench
TSW-2044H	0.5	A-06

GMX07/MXG07 TYPE

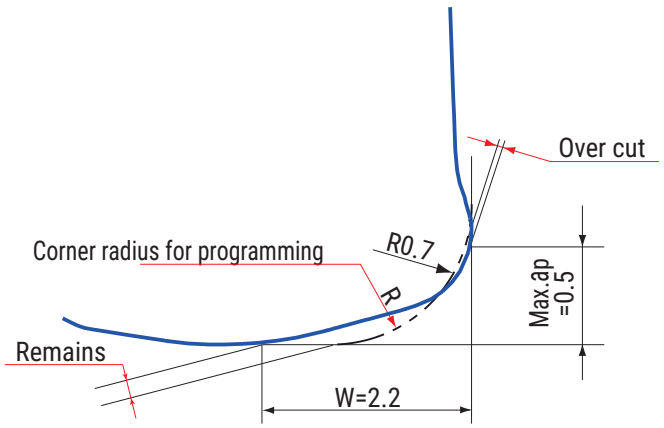
Insert





Cat.No.	Tolerance	PVD Coating		Dimensions (mm)			
		JC8050	JC8118	RE	L	W1	S
ENMU07T207ZER-PM	M	●	●	0.7	7	4.25	2.85

■ Definition of corner shape for programming

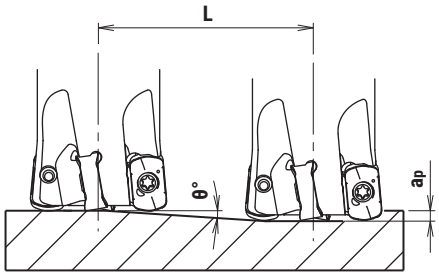


(mm)

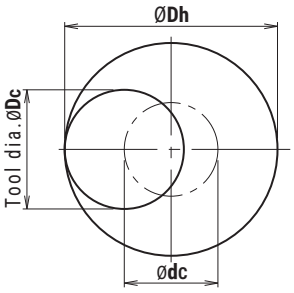
Corner radius for programming	Remains	Over cut
1.0 (Std.)	0.21	0
1.5	0.10	0.15
2.0	0.01	0.85

■ Recommended Data for Profile Milling

Ramping



Helical interpolation



● Calculation of tool pass dia.

Ødc = ØDh − ØDc
Tool pass dia. Bore dia. Tool dia.

● Depth of cut per one circuit should not exceed max. depth of cut ap

● Down cutting is recommended, tool pass rotation should be counterclockwise

● In case of ramping and helical interpolation, apply 70% or less feed (Vf) from standard cutting condition table

● Drilling is not recommended.

ENMU07T207ZER-PM

Tool dia. (mm)	Effective Cutting dia. (mm)	Max. depth of cut **APMX** (mm)	Ramping		Helical interpolation		
			Max.ramping angle **RMPX** θ°	Total cutting length at **APMX** : **L**(mm)	Through hole **Min**.bore dia. **Dh** (mm)	Blind hole,flat bottom **Min**.bore dia. **Dh** (mm)	Through hole **Max**.bore dia. **Dh** (mm)
10	5.5	0.5	1.1	26.0	15	16	19
12	7.5	0.5	1.2	23.9	19	20	23
13	8.4	0.5	1.1	26.0	21	22	25
16	11.4	0.5	0.9	31.8	27	28	31

■ Recommended Cutting Conditions | GMX07/MXG07 type

Material	Insert	Grade	*Vc* (m/min)	*fz* (mm/t)	*ap* (mm)	*ae* (mm)
Carbon Steel below 250HB	ENMU07...–PM	JC8050	165	1.0	0.3	0.5–0.6 Dc
Tool & Die Steel below 255HB	ENMU07...–PM	JC8050	150	1.0	0.3	0.5–0.6 Dc
Mold Steel 30–36HRC	ENMU07...–PM	JC8050	150	1.0	0.3	0.5–0.6 Dc
Mold Steel 38–43HRC	ENMU07...–PM	JC8118	120	0.9	0.3	0.5–0.6 Dc
Hardened Die Steel 42–52HRC	ENMU07...–PM	JC8118	90	0.6	0.25	0.5–0.6 Dc
Grey Cast Iron	ENMU07...–PM	JC8118	200	1.0	0.3	0.5–0.6 Dc
Nodular Cast Iron	ENMU07...–PM	JC8118	200	1.0	0.3	0.5–0.6 Dc
Stainless Steel	ENMU07...–PM	JC8050	165	1.0	0.3	0.5–0.6 Dc

Note:

1. These parameters represent stable machining at lengths 3×D.
   Please adjust cutting conditions according to machine rigidity or work rigidity.
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use air blow.

Achieving high metal removal rates!
High efficiency machining for versatile applications



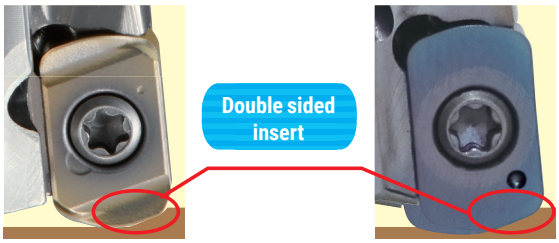




Feature 1

Optimized cutting edge for a wide range of applications

ENMU Type
For high feed
with chipbreaker



ENMQ Type
For hard materials

Feature 2

Economical double sided insert with 4 cutting edges for various types of materials;
Carbon steel, Hardened material <upto 62HRC>, Stainless steel, Titanium alloy

● **Line up**

Low cutting force → Edge strength



ENMU100412ZER-SL
- Low cutting force
- Sharp cutting edge
- Grade C7550, JC7518
  DS118, DS150



ENMU100412ZER-PH
- For general applications
- Grade JC8118, JC8050, JC7560

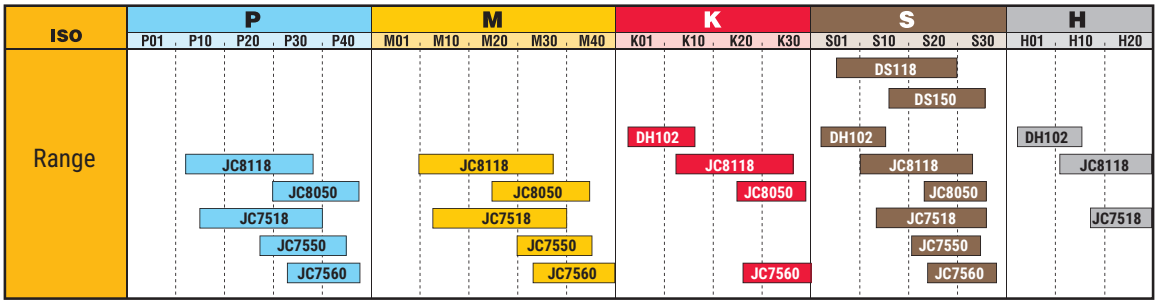


ENMU100312ZER-HL
- For hardened materials
  up to 60HRC
- enhanced cutting edge strength
  but retains sharpness
- Grade DH102



ENMQ100312ZER
- Flat top insert
- Grade DH102
- For hardened materials
  over 60HRC

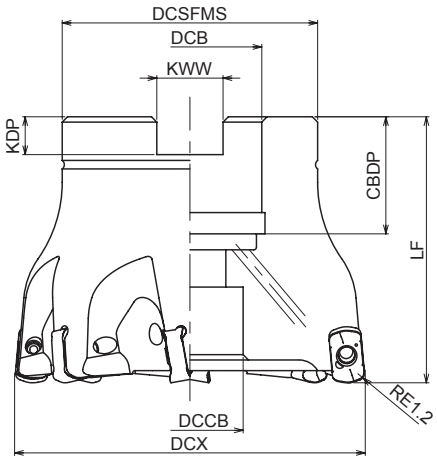
● **Insert grades**



Through coolant hole | G - Body | Face Milling | Copy Milling | Pocket Milling | Helical Interpolation | Slotting

GMX10 TYPE Bore Type





Cat.No	Stock	No. of inserts	Dimensions (mm)								Weight (kg)	Inserts
			DCX	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP		
GMX-6040R-16+A	●	6	40	45	35	16	13.5	8.4	5.6	19	0.24	ENMU100412ZER-** ENM*100312ZER-**
GMX-6042R-16+A	●	6	42	45	35	16	13.5	8.4	5.6	19	0.25	
GMX-7050R-22	●	7	50	50	40	22	17	10.4	6.3	20	0.35	
GMX-7052R-22	●	7	52	50	40	22	17	10.4	6.3	20	0.40	
GMX-7063R-22	●	7	63	50	48	22	17	10.4	6.3	20	0.64	
GMX-7066R-27	●	7	66	50	48	27	20	12.4	7	22	0.66	

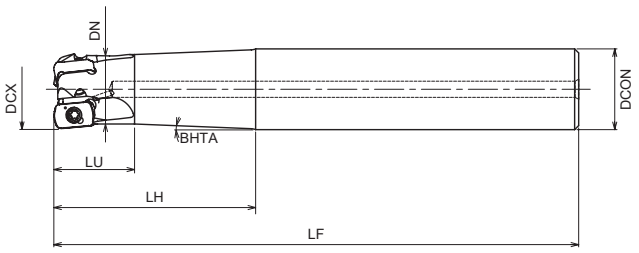
Screw	Torque(N.m)	Wrench
TSW-2567H	1.1	A-08

QM MAX GII — GMX10/MXG10 Type

Through coolant hole | Face Milling | Copy Milling | Pocket Milling | Helical Interpolation | Slotting

GMX10 TYPE — Shank Type





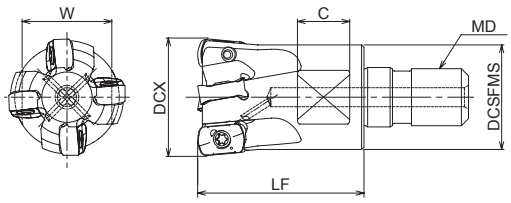
Cat.No.	Stock	No. of inserts	Dimensions (mm)							Insert
			DCX	LU	LH	LF	DN	BHTA	DCON	
GMX-2016-30-S16	●	2	16	16	30	100	14	3.5°	16	ENMU100412ZER-** ENM*100312ZER-**
GMX-2016-50-S16	●	2	16	16	50	150	14	1.2°	16	
GMX-3020-50-S20	●	3	20	20	50	130	17.2	2.3°	20	
GMX-3020-80-S20	●	3	20	20	80	160	17.2	1°	20	
GMX-4025-60-S25	●	4	25	25	60	140	22	2°	25	
GMX-4025-100-S25	●	4	25	25	100	180	22	0.9°	25	
GMX-5032-70-S32	●	5	32	30	70	150	29	1.5°	32	
GMX-5032-120-S32	●	5	32	30	120	200	29	0.6	32	

Screw	Torque(N.m)	Wrench
TSW-2567H	1.1	A-08

Through coolant hole | G - Body | Face Milling | Copy Milling | Pocket Milling | Helical Interpolation | Slotting

MXG10 TYPE Modular Type





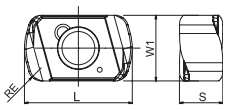
Cat.No.	Stock	No. of inserts	Dimensions (mm)						Insert
			DCX	LF	DCSFMS	MD	C	W	
MXG-2016-M8	●	2	16	23	14	M8	8	12	ENMU100412ZER-** ENM*100312ZER-**
MXG-2017-M8	●	2	17	23	14	M8	8	12	
MXG-3020-M10	●	3	20	30	18	M10	9	14	
MXG-3021-M10	●	3	21	30	18	M10	9	14	
MXG-3022-M10	○	3	22	30	18	M10	9	14	
MXG-3025-M12	●	3	25	35	22	M12	11	19	
MXG-4025-M12	●	4	25	35	22	M12	11	19	
MXG-4026-M12	●	4	26	35	22.5	M12	11	19	
MXG-4028-M12	○	4	28	35	23.6	M12	11	19	
MXG-5030-M16	●	5	30	43	27	M16	12	22	
MXG-5032-M16	●	5	32	43	29	M16	12	22	
MXG-5035-M16	●	5	35	43	29	M16	12	22	
MXG-6040-M16	●	6	40	43	32	M16	14	26	
MXG-6042-M16	●	6	42	43	32	M16	14	26	

Screw	Torque(N.m)	Wrench
TSW-2567H	1.1	A-08

GMX10/MXG10 TYPE Insert

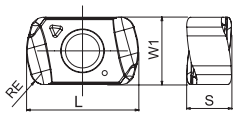
ENMU100412ZER-PH



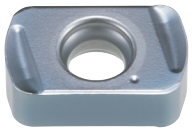


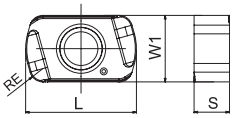
ENMU100412ZER-SL





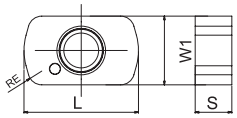
ENMU100312ZER-HL





ENMQ100312ZER

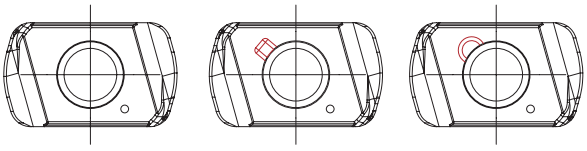




Cat.No.	Tolerance	PVD Coating								Dimensions (mm)			
		DH102	JC7518	JC7550	JC7560	JC8050	JC8118	DS118	DS150	RE	L	W1	S
ENMU100412ZER-PH	M				●	●	●			1.2	10	6	4
ENMU100412ZER-SL	M		●	●				●	●	1.2	10	6	4
ENMU100312ZER-HL	M	●								1.2	10	6	3.2
ENMQ100312ZER	M	●								1.2	10	6	3.2

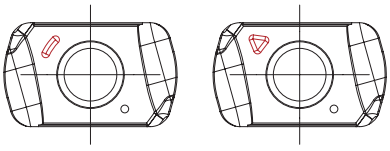
GRADE MARKING

ENMU100412ZER-PH



JC8118 JC8050 JC7560

ENMU100412ZER-SL



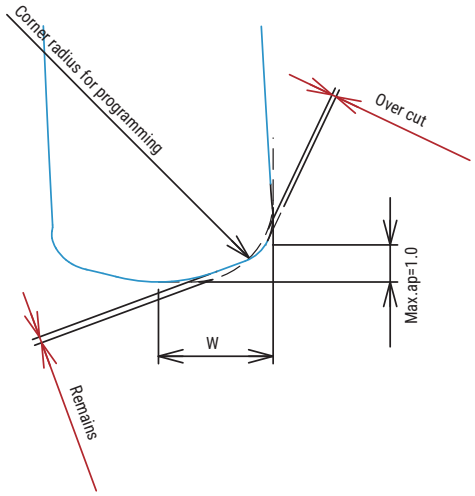
JC7518/DS118 JC7550/DS150

■ Insert selection guide

Materials	Grade	Cat.No.			
		ENMU100412ZER-PH	ENMU100412ZER-SL	ENMU100312ZER-HL	ENMQ100312ZER
Chip breaker		For general milling	Low cutting force	For Hardened materials	Flat top insert
Carbon steel (S50C, S55C) below 250HB	JC8118	○			
	JC8050	◎			
	JC7560	●			
	JC7550				
	JC7518		☆		
	DH102				
	DS118				
	DS150				
Tool & die steel (SKD61, SKD11) below 255HB	JC8118	○			
	JC8050	◎			
	JC7560	●			
	JC7550				
	JC7518		☆		
	DH102				
	DS118				
	DS150				
Mold steel (HPM7, PX5, P20) 30 - 36HRC	JC8118	○			
	JC8050	◎			
	JC7560	●			
	JC7550				
	JC7518		☆		
	DH102				
	DS118				
	DS150				
Mold steel (NAK80, HPM1, P21) 38 - 43HRC	JC8118	◎			
	JC8050	●			
	JC7560				
	JC7550				
	JC7518		☆		
	DH102				
	DS118				
	DS150				
Hardened die steel (SKD61, DAC, DHA) 42 - 52HRC	JC8118	◎			
	JC8050				
	JC7560				
	JC7550				
	JC7518		☆		
	DH102			●	
	DS118				
	DS150				
Hardened die steel (SKD11, SLD, DC11) 55 - 62HRC	JC8118	×			
	JC8050	×			
	JC7560	×			
	JC7550		×		
	JC7518		×		
	DH102			○	◎
	DS118				
	DS150				
Grey cast iron (FC、FCD) below 300HB	JC8118	◎			
	JC8050	○			
	JC7560	●			
	JC7550				
	JC7518				
	DH102				
	DS118				
	DS150				
Stainless steel (SUS304) below 250HB	JC8118				
	JC8050	●			
	JC7560				
	JC7550		○		
	JC7518				
	DH102				
	DS118				
	DS150		◎		
Titanium alloy (Ti-6Al-4V)	JC8118				
	JC8050	●			
	JC7560				
	JC7550		○		
	JC7518				
	DH102				
	DS118				
	DS150		◎		
Heat resistant alloy (INCO718)	JC8118				
	JC8050	●			
	JC7560				
	JC7550				
	JC7518		○		
	DH102				
	DS118		◎		
	DS150				

◎ : First choice ○ : For general milling ● : For unstable milling ☆ : For light cutting resistance × : Not recommended

Definition of Corner Shape for Programming



Cat.No.	W	Corner radius for programming	Remains	Over cut
ENMU100412ZER-PH ENMU100412ZER-SL	3.1	1.0	0.51	0
		1.5 (Standard)	0.36	0
		2.0	0.22	0.05

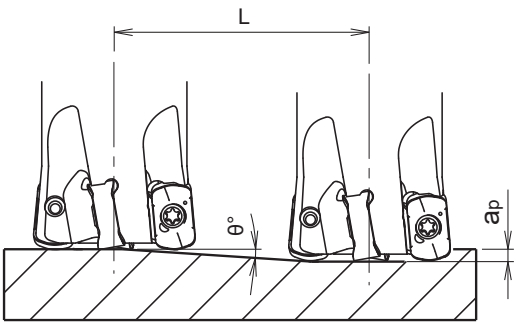
(mm)

Cat.No.	W	Corner radius for programming	Remains	Over cut
ENMU100312ZER-HL ENMQ100312ZER	3.3	1.0	0.55	0
		1.5 (Standard)	0.41	0
		2.0	0.26	0.04

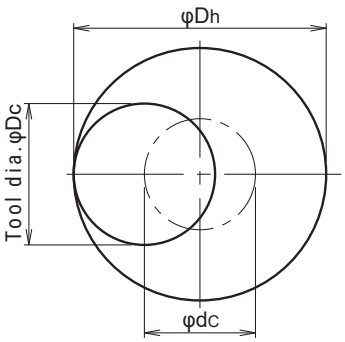
(mm)

■ Recommended Data for Profile Milling

Ramping



Helical interpolation



- Calculation of tool pass dia.

$$\varphi dc = \varphi Dh - \varphi Dc$$

Tool pass dia. Bore dia. Tool dia.

- Depth of cut per one circuit should not exceed max. depth of cut Ap
- Down cutting is recommended, tool pass rotation should be counterclockwise

- In case of ramping and helical interpolation, apply 70% or less feed (Vf) from standard cutting condition table
- In case of drilling, apply 50% or less Z axis feed (F) from standard cutting condition table
- Long consecutive chips may result in case of drilling, confirm safe operating conditions

Cat.No.	Tool dia.	Effective Cutting dia.		Max. depth of cut: ap	Ramping	
		Insert			Ramping Max. ramping Angle θ	Max. depth of cut (ap) Total cutting length:L (mm)
		ENMU100412ZER-※※	ENM※100312ZER-※※			
MXG-2016-M8	16	10.1	9.6	0.7	1°36'	25.1
MXG-2017-M8	17	11	10.5	0.7	1°36'	25.1
MXG-3020-M10	20	13.9	13.5	1	1°30'	38.2
MXG-3021-M10	21	14.9	14.5	1	1°30'	38.2
MXG-∗025-M12	25	18.9	18.4	1	1°12'	47.7
MXG-4026-M12	26	19.9	19.4	1	1°12'	47.7
MXG-5030-M16	30	23.9	23.4	1	0°54'	63.6
MXG-5032-M16	32	25.8	25.4	1	0°54'	63.6
MXG-5035-M16	35	28.8	28.4	1	0°42'	81.8
MXG-6040-M16	40	33.8	33.4	1	0°30'	114.5
MXG-6042-M16	42	35.8	35.4	1	0°30'	114.5
GMX-2016-∗∗-S16	16	10.1	9.6	0.7	1°36'	25.1
GMX-3020-∗∗-S20	20	13.9	13.5	1	1°30'	38.2
GMX-4025-∗∗-S25	25	18.9	18.4	1	1°12'	47.7
GMX-5032-∗∗-S32	32	25.8	25.4	1	0°54'	63.6
GMX-7050R-∗∗	50	43.8	43.4	1	0°24'	143.2
GMX-7052R-22	52	45.8	45.4	1	0°24'	143.2
GMX-7063R-∗∗	63	56.8	56.4	1	0°18'	190.9
GMX-7066R-∗∗	66	59.8	59.4	1	0°18'	190.9

Cat.No.	Tool dia.	Helical interpolation		Max. Bore dia.	Max.drilling depth :Z	
		Min.Bore dia.				
		Insert			Insert	
		ENMU100412ZER-※※	ENM※100312ZER-※※		ENMU100412ZER-※※	ENM※100312ZER-※※
MXG-2016-M8	16	22	21	30	0.3	0.2
MXG-2017-M8	17	24	23	32	0.3	0.2
MXG-3020-M10	20	30	29	38	0.4	0.2
MXG-3021-M10	21	32	31	40	0.4	0.2
MXG-∗025-M12	25	40	39	48	0.5	0.3
MXG-4026-M12	26	42	41	50	0.5	0.3
MXG-5030-M16	30	50	49	58	0.6	0.4
MXG-5032-M16	32	54	53	62	0.6	0.4
MXG-5035-M16	35	60	59	68	0.6	0.4
MXG-6040-M16	40	70	69	78	0.7	0.5
MXG-6042-M16	42	74	73	82	0.7	0.5
GMX-2016-∗∗-S16	16	22	21	30	0.3	0.2
GMX-3020-∗∗-S20	20	30	29	38	0.4	0.2
GMX-4025-∗∗-S25	25	40	39	48	0.5	0.3
GMX-5032-∗∗-S32	32	54	53	62	0.6	0.4
GMX-7050R-∗∗	50	90	89	98	0.8	0.6
GMX-7052R-22	52	94	93	102	0.8	0.6
GMX-7063R-∗∗	63	116	115	124	0.8	0.6
GMX-7066R-∗∗	66	122	121	130	0.8	0.6

■ Recommended Cutting Conditions | GMX10 / MXG10 type

Material	Insert	Grade	*Vc* (m/min)	*fz* (mm/t)	*ap* (mm)	*ae* (mm)
Carbon Steel below 250HB	–PH	JC8050 (JC7560)	180 (130–180)	1.2	0.4–1.0	0.7 Dc
Tool & Die Steel below 255HB	–PH	JC8050 (JC7560)	180 (130–180)	1.2	0.4–1.0	0.7 Dc
Mold Steel 30-36HRC	–PH	JC8050 (JC7560)	160 (130–160)	1.2	0.4–1.0	0.7 Dc
Mold Steel 38-43HRC	–PH	JC8118 (JC8050)	100 (70–100)	1.1 (0.8–1.1)	0.3–0.8	0.7 Dc
Hardened Die Steel 42-52HRC	–PH (–SL)	JC8118 (JC7518)	90 (70–90)	1.1 (0.8–1.1)	0.1–0.6	0.6 Dc
Hardened Die Steel 55-62HRC	ENMQ.. (ENMU..–HL)	DH102	80 (60–80)	0.3 (0.25–0.3)	0.1–0.2	0.4 Dc
Grey Cast Iron	–PH	JC8118 (JC8050)	200 (150–200)	1.5 (1.2–1.5)	0.4–1.0	0.7 Dc
Nodular Cast Iron	–PH	JC8118 (JC8050)	200 (150–200)	1.5 (1.2–1.5)	0.4–1.0	0.7 Dc
Austenitic Stainless Steel	–SL	JC7550 (JC7518)	120 (100–120)	1.0 (0.8–1.0)	0.3–0.8	0.6 Dc
Precipitationhardening Stainless Steel	–SL (–PH)	JC7550 (JC8050)	100 (90–100)	0.7 (0.6 -0.7)	0.2–0.6	0.6 Dc
Duplex Stainless Steel	–SL (–PH)	JC7550 (JC8050)	100 (90–100)	0.3 (0.2–0.3)	0.3–0.8	0.6 Dc
Titanium Alloy	–SL	DS150 (DS118)	60 (50–60)	0.7 (0.6–0.7)	0.3–0.7	0.6 Dc
Heat Resistant Alloy	–SL	JC7518 (JC7550)	30 (20–30)	0.3	0.2~0.7	0.6 Dc

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity. (the above table is guide for cutting on a BT50 machine.)
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use air blow.

QM MAX Quick & Mini

New generation high feed mill "QM MAX"

Modular Type φ16～φ42

Bore Type φ40～φ66 G - Body

Shank Type φ16～φ25



Low cutting force geometry

Unique 3D geometry insert provides stable cutting and less power consumption.

Multi - flutes specification

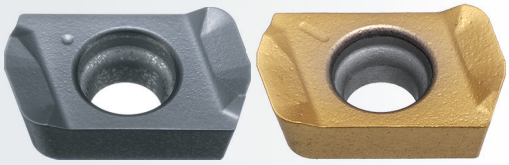
High speed and high efficient machining.

Vibration free

Control vibration with combination of MSN carbide shank holder

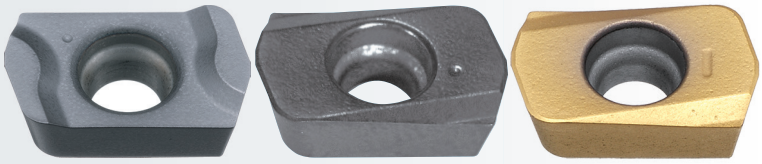
Insert Line-Up

High feed insert



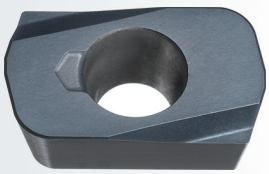
EPMT100312ZER EPMT100312ZER

High feed insert for unfavorable conditions



EPMW100312ZER EPMW100312ZTR EPMW100312ZTR

For high hardened steel



EPHW1003...ZTR
(R1.6, 2.0)

Shoulder insert for aluminum



ZPMT1003...ZER-NL
(R0.4, 0.8, 2.0)

Shoulder insert for general steel



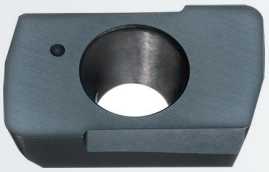
ZPMT1003...ZER-PL
(R0.4, 0.8, 1.6, 2.0)

Shoulder insert for Ti alloy



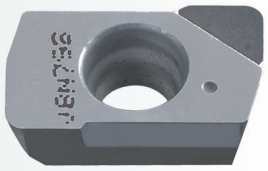
ZPMT1003...ZER-SL
(R0.4, 0.8, 2.0)

"Mirror Insert" for finishing side & bottom face



YPHW1003...ZER-...

CBN insert



YPHW100308ZTR-F1

A variety of inserts all fit into the same body.

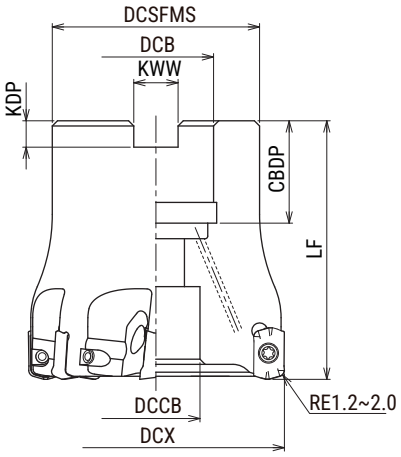
Multi-purpose cutter that can high feed, square up and finish.

QXP TYPE Bore Type

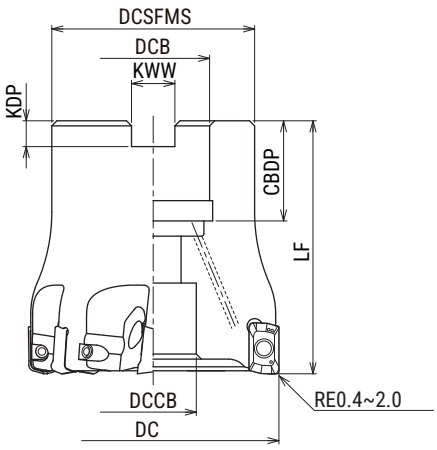
Through coolant hole | G - Body | Face Milling | Shoulder Milling | Slotting | Copy Milling | Pocket Milling | Helical Interpolation



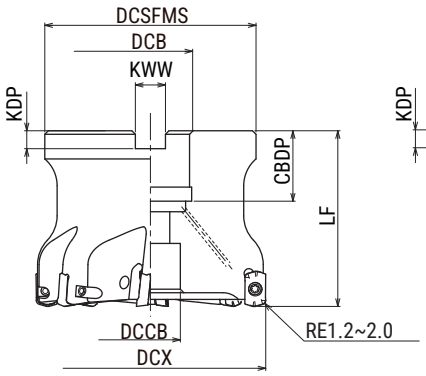
● High feed



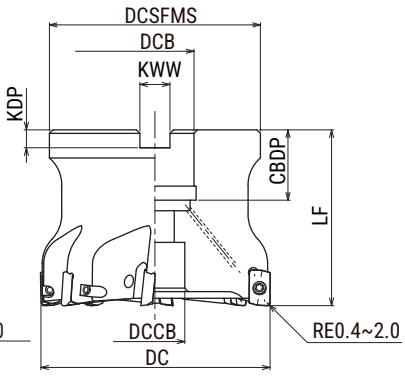
● Shoulder milling



● High feed (QXP-8066R)



● Shoulder milling (QXP-8066R)



Cat.No.	Stock	No. of inserts	Dimensions (mm)								Insert
			DCX	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP	
QXP-6040R-16	●	6	40	45	35	16	14	8.4	5.6	18	
QXP-7040R-16	●	7	40	45	35	16	14	8.4	5.6	18	
QXP-7050R-22	●	7	50	50	40	22	17	10.4	6.3	20	EP**1003**Z*R
QXP-8050R-22	●	8	50	50	40	22	17	10.4	6.3	20	ZPMT1003**ZER-**
QXP-8052R-22	●	8	52	50	40	22	17	10.4	6.3	20	YPHW1003**Z*R-**
QXP-8063R-22	●	8	63	50	48	22	17	10.4	6.3	20	
QXP-8066R-27	●	8	66	50	48	27	20	12.4	7	22	

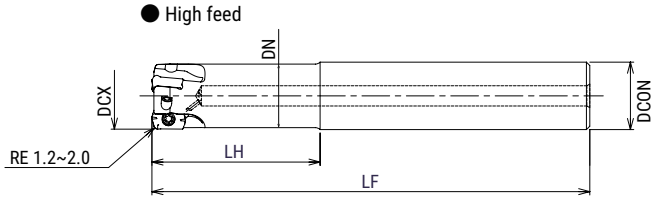
Screw	Torque(N.m)	Wrench
DSW-2563H	1.1	A-08

QXPS TYPE Shank Type

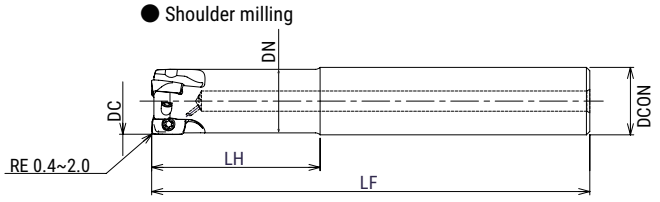
Through coolant hole | Face Milling | Shoulder Milling | Slotting | Copy Milling | Pocket Milling | Helical Interpolation



● High feed



● Shoulder milling



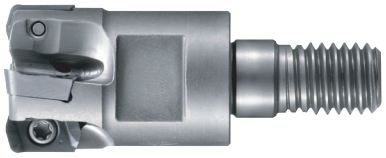
Cat.No	Stock	No. of inserts	Dimensions (mm)					Parts		Insert
			DCX	LH	LF	DN	DCON	Screw	Wrench	
QXPS2016S16+A	●	2	16	30	100	15	16	TSW-2556H	A-08	EP**1003**Z*R ZPMT1003**ZER-** YPHW1003**Z*R-**
QXPS3020S20+A	●	3	20	50	130	18.85	20			
QXPS4025S25+A	●	4	25	60	140	23.6	25	DSW-2563H		

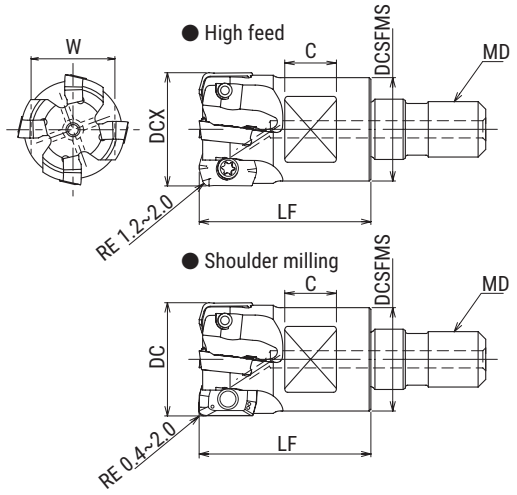
Screw	Torque(N.m)
TSW-2556H	1.1
DSW-2563H	

QM MAX — MQX/QXP Type

MQX TYPE Modular Type

Through coolant hole | G - Body | Face Milling | Shoulder Milling | Slotting | Copy Milling | Pocket Milling | Helical Interpolation





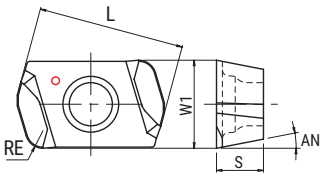
Cat.No.	Stock	No. of inserts	Dimensions (mm)						Parts		Insert
			DCX	LF	DCSFMS	MD	C	W	Screw	Wrench	
MQX-2016-M8	●	2	16	23	14	M8	8	12	TSW-2556H	A-08	EP**1003**Z*R ZPMT1003**ZER-** YPHW1003**Z*R-**
MQX-2017-M8	●	2	17	23	14	M8	8	12			
MQX-3020-M10	●	3	20	30	18	M10	9	14			
MQX-4020-M10	●	4	20	30	18	M10	9	14			
MQX-4021-M10	●	4	21	30	18	M10	9	14			
MQX-4025-M12	●	4	25	35	22.5	M12	10	17	DSW-2563H		
MQX-5025-M12	●	5	25	35	22.5	M12	10	17			
MQX-4026-M12	●	4	26	35	22.5	M12	10	17			
MQX-5026-M12	●	5	26	35	22.5	M12	10	17			
MQX-5028-M12	○	5	28	35	23.6	M12	10	17			
MQX-5030-M16	○	5	30	43	27	M16	12	22			
MQX-5032-M16	●	5	32	43	29	M16	12	22			
MQX-6032-M16	●	6	32	43	29	M16	12	22			
MQX-5035-M16	●	5	35	43	29	M16	12	22			
MQX-6035-M16	●	6	35	43	29	M16	12	22			
MQX-6040-M16	●	6	40	43	32	M16	14	26			
MQX-7040-M16	●	7	40	43	32	M16	14	26			
MQX-6042-M16	●	6	42	43	32	M16	14	26			

Screw	Torque(N.m)
TSW-2556H	1.1
DSW-2563H	

MQX/QXP TYPE Insert

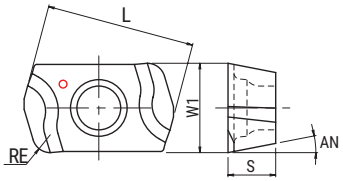
High feed insert
(EPMT1003＊＊ZER)



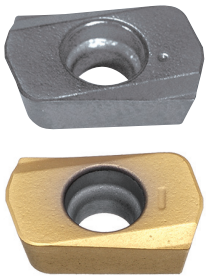


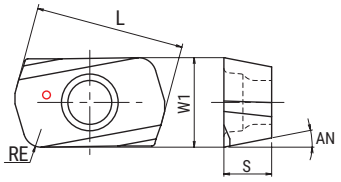
High feed insert for unfavorable conditions
(EPMW100312ZER)



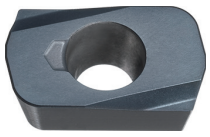


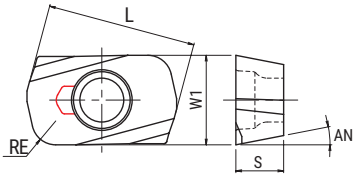
High feed insert for unfavorable conditions
(EPMW100312ZTR)





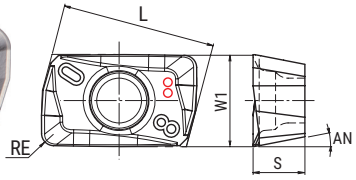
For high hardened steel
(EPHW1003＊＊ZTR)





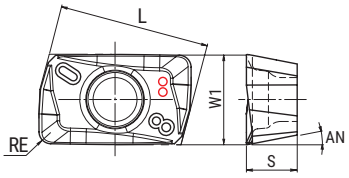
Shoulder insert for aluminum
(ZPMT1003＊＊ZER-NL)





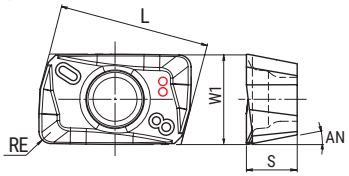
Shoulder insert for general steel
(ZPMT1003＊＊ZER-PL)



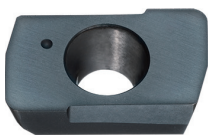


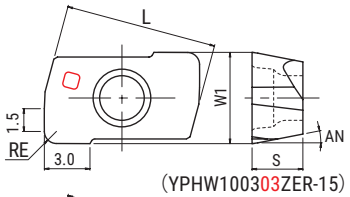
Shoulder insert for Ti alloy
(ZPMT1003＊＊ZER-SL)



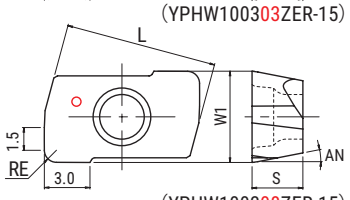


"Mirror Insert" for finishing side & bottom face
(YPHW1003＊＊ZER-15) (YPHW100308ZTR-F1) (YPHW100308ZER-F)

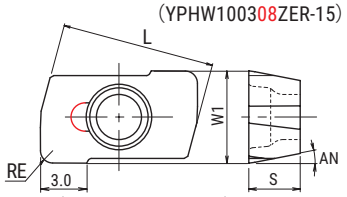




(YPHW100303ZER-15)



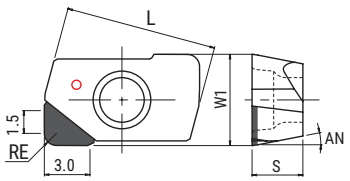
(YPHW100308ZER-15)



(YPHW100308ZER-F) (for low feed)

CBN insert

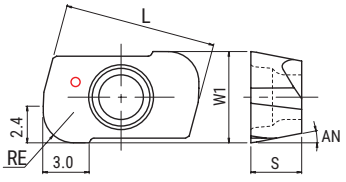




(YPHW100308ZTR-F1)

"Mirror Insert" for finishing side & bottom face
(YPHW100320ZER-24)



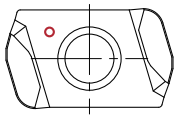


QM MAX — MQX/QXP Type

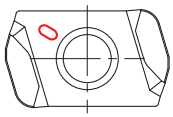
Type	Cat. No.	Tolerance	PVD coating									Uncoated	Cermet	CBN	Dimensions (mm)				
			JC8118	DH102	JC7518	JC7550	JC7560	JC8015	JC8050	DS118	DS150	FC18	CX75	JBN795	L	S	W1	RE	AN
High feed insert	EPMT100312ZER	M	●			●	●		●	●	●				10	3.2	6	1.2	11°
	EPMT100320ZER	M	●												10	3.2	6	2.0	11°
High feed insert for unfavorable conditions	EPMW100312ZER	M	●						●						10	3.2	6	1.2	11°
	EPMW100312ZTR	M	●				●		●						10	3.2	6	1.2	11°
For high hardened steel	EPHW100316ZTR	H	●	●											10	3.2	6	1.6	11°
	EPHW100320ZTR	H	●	●											10	3.2	6	2.0	11°
Shoulder insert for aluminum	ZPMT100304ZER-NL	M										●			10.08	3.4	6	0.4	11°
	ZPMT100308ZER-NL	M										●			10.08	3.4	6	0.8	11°
	ZPMT100320ZER-NL	M										●			10.08	3.4	6	2.0	11°
Shoulder insert for general steel	ZPMT100304ZER-PL	M	●	●					●				●		10.08	3.4	6	0.4	11°
	ZPMT100308ZER-PL	M	●	●					●				●		10.08	3.4	6	0.8	11°
	ZPMT100316ZER-PL	M	●						●						10.08	3.4	6	1.6	11°
	ZPMT100320ZER-PL	M	●	●					●				●		10.08	3.4	6	2.0	11°
Shoulder insert for Ti alloy	ZPMT100304ZER-SL	M			●					●					10.08	3.4	6	0.4	11°
	ZPMT100308ZER-SL	M			●					●					10.08	3.4	6	0.8	11°
	ZPMT100320ZER-SL	M			●					●					10.08	3.4	6	2.0	11°
"Mirror Insert" for finishing side & bottom face	YPHW100303ZER-15	H		●				●					●		10.06	3.35	6	0.3	11°
	YPHW100308ZER-15	H		●									●		10.06	3.35	6	0.8	11°
	YPHW100308ZER-F	H						●							10.06	3.35	6	0.8	11°
	YPHW100308ZTR-F1	H												○	10.06	3.35	6	0.8	11°
	YPHW100320ZER-24	H		●				●							10.06	3.35	6	2.0	11°

GRADE MARKING

●EPMT1003... / EPMW1003...

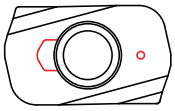


JC8118/DS118

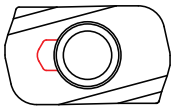


JC8050/JC7560/DS150

●EPHW1003...

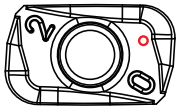


JC8118

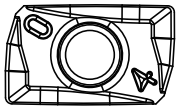


DH102

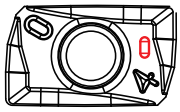
●ZPMT1003...



JC8118/JC7518
DS118/FC18

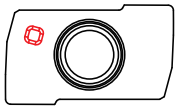


DH102

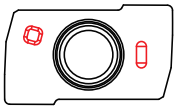


JC8050/CX75

●YPHW100303ZER-15

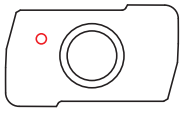


DH102/CX75



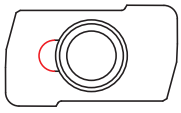
JC8015

●YPHW100308ZER-15



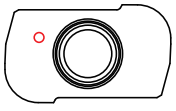
DH102/CX75

●YPHW100308ZER-F

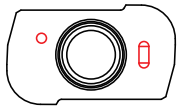


JC8015

●YPHW100320ZER-24



DH102



JC8015

■ Insert selection guide

Material	Carbon steel (S50C, S55C) below 250HB						Tool & die steel (SKD61, SKD11) below 255HB						Mold steel (HPM7, PX5, P20) 30-36HRC						Mold steel (NAK80, HPM1, P21) 38-43HRC					
Grade / Cat.No.	JC8118	JC8050	JC7560	DH102	DS118	DS150	JC8118	JC8050	JC7560	DH102	DS118	DS150	JC8118	JC8050	JC7560	DH102	DS118	DS150	JC8118	JC8050	JC7560	DH102	DS118	DS150
EPMT1003＊＊ZER	☆	☆	☆				☆	☆	☆				☆	☆	☆				☆	☆				
EPMW100312ZER																				○				
EPMW100312ZTR	○	○	◎				○	○	◎				○	○	◎				◎	○				
EPHW100316ZTR																								

Material	Hardened die steel (SKD61, DAC, DHA) 42-52 HRC						Hardened die steel (SKD11, SLD, DC11) 55-62HRC						Grey cast iron (FC, FCD) below 300HB						Stainless steel (SUS304) below 250HB					
Grade / Cat.No.	JC8118	JC8050	JC7560	DH102	DS118	DS150	JC8118	JC8050	JC7560	DH102	DS118	DS150	JC8118	JC8050	JC7560	DH102	DS118	DS150	JC8118	JC8050	JC7560	DH102	DS118	DS150
EPMT1003＊＊ZER	☆						×	×					○							◎	○			
EPMW100312ZER	○						○						◎							●				
EPMW100312ZTR	●						●						●		○									
EPHW100316ZTR	◎									◎														

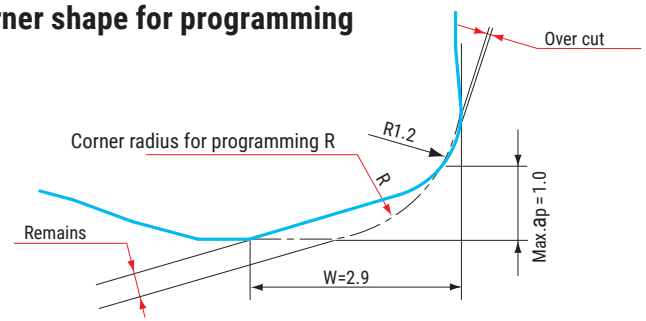
Material	Titanium alloy (Ti-6Al-4V)						Heat resistant alloy (INCO718)					
Grade / Cat.No.	JC8118	JC8050	JC7560	DH102	DS118	DS150	JC8118	JC8050	JC7560	DH102	DS118	DS150
EPMT1003＊＊ZER	○	○	●		○	◎	◎	○	○		○	○
EPMW100312ZER		●						●				
EPMW100312ZTR												
EPHW100316ZTR												

- EPMT Type : with chip breaker
- EPMW Type : without chip breaker

◎: First choice
○: For general milling
●: For unstable milling
☆: For light cutting force
×: Not recommended

■ Definition of corner shape for programming

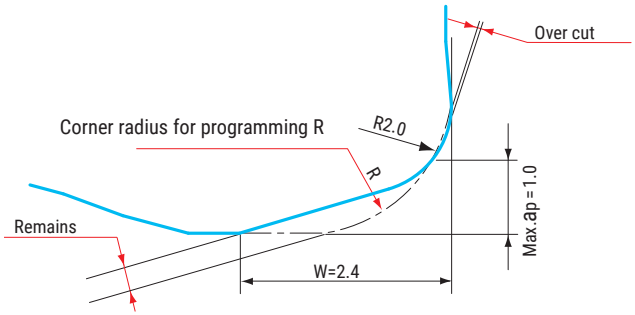
• EPMT/W Type (RE＝R1.2)



(mm)

Corner radius for programming R	Over cut	Remains
R1.0	0	0.57
R1.5 (Std.)	0	0.45
R2.0	0.04	0.33
R2.5	0.21	0.21
R3.0	0.40	0.09

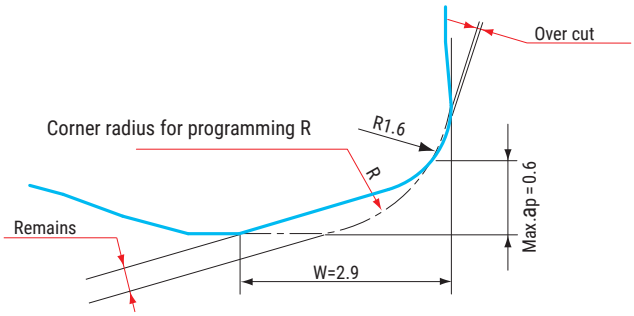
• EPMT Type (RE＝R2.0)



(mm)

Corner radius for programming R	Over cut	Remains
R1.0	0	0.51
R1.5	0	0.31
R2.0 (Std.)	0	0.13
R2.5	0.12	0.04
R3.0	0.32	0

• EPHW Type

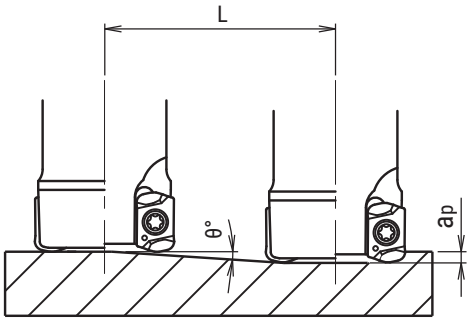


(mm)

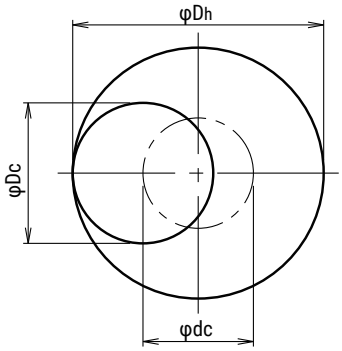
Corner radius for programming R	Over cut	Remains
R1.0	0	0.42
R1.5 (Std.)	0	0.33
R2.0	0.01	0.23
R2.5	0.17	0.14
R3.0	0.37	0.05

■ Recommended Data for Profile Milling

Ramping



Helical interpolation



- Calculation of tool pass dia.

φdc = φDh - φDc

Tool pass dia. Bore dia. Tool Dia.

- Depth of cut per one circuit should not exceed max. depth of cut Ap
- Down cutting is recommended, tool pass rotation should be counterclockwise

- In case of ramping and helical interpolation, apply 70% or less feed (Vf) from standard cutting condition table
- In case of drilling, apply 50% or less Z axis feed (F) from standard cutting condition table
- Long consecutive chips may result in case of drilling, confirm safe operating conditions

■ EPM*100312ZER

Cat.No.	Tool dia.	Effective Cutting dia.	Max.depth of cut : ap	Ramping		Helical interpolation		Max.drilling depth Z(mm)
				Max.ramping angle θ	Max.depth of cut (ap) Total cutting length L (mm)	Min.Bore dia.	Max.Bore dia.	
QXP-＊040R-16	40	34.1	1	0.5	114.6	70	78	0.6
QXP-＊050R-＊＊	50	44.1	1	0.4	143.2	90	98	0.6
QXP-8052R-22	52	46.1	1	0.35	163.7	94	102	0.6
QXP-8063R-＊＊	63	57.1	1	0.3	191	116	124	0.6
QXP-8066R-＊＊	66	60.1	1	0.3	191	122	130	0.6
QXPS2016S16+A	16	10.2	0.8	1.8	25.5	22	30	0.6
QXPS3020S20+A	20	14.1	0.8	1.4	32.7	30	38	0.6
QXPS4025S25+A	25	19.1	0.8	1	45.8	40	48	0.6
MQX-＊016-M8	16	10.2	0.8	1.8	25.5	22	30	0.6
MQX-＊017-M8	17	11.2	0.8	1.6	28.6	24	32	0.6
MQX-＊020-M10	20	14.1	0.8	1.4	32.7	30	38	0.6
MQX-＊021-M10	21	15.1	0.8	1.3	35.3	32	40	0.6
MQX-＊025-M12	25	19.1	0.8	1	45.8	40	48	0.6
MQX-＊026-M12	26	20.1	0.8	0.95	48.2	42	50	0.6
MQX-＊028-M12	28	22.1	0.8	0.85	53.9	46	54	0.6
MQX-＊030-M16	30	24.1	0.8	0.8	57.3	50	58	0.5
MQX-＊032-M16	32	26.1	0.8	0.7	65.5	54	62	0.5
MQX-＊035-M16	35	29.1	0.8	0.6	76.4	60	68	0.5
MQX-＊040-M16	40	34.1	0.8	0.5	91.7	70	78	0.6
MQX-＊042-M16	42	36.2	0.8	0.45	101.9	74	82	0.6

Recommended Data for Profile Milling

EPMT100320ZER

Cat.No.	Tool dia.	Effective Cutting dia.	Max.depth of cut : ap	Ramping		Helical interpolation		Max.drilling depth Z(mm)
				Max.ramping angle θ	Max.depth of cut (ap) Total cutting length L (mm)	Min.Bore dia.	Max.Bore dia.	
QXP-＊040R-16	40	35.1	1	0.55	104.2	72	78	0.7
QXP-＊050R-＊＊	50	45.1	1	0.4	143.2	92	98	0.7
QXP-8052R-22	52	47.2	1	0.4	143.2	96	102	0.7
QXP-8063R-＊＊	63	58.2	1	0.3	191	118	124	0.7
QXP-8066R-＊＊	66	61.2	1	0.3	191	124	130	0.7
QXPS2016S16+A	16	11.2	0.8	2.3	19.9	24	30	0.7
QXPS3020S20+A	20	15.1	0.8	1.5	30.6	32	38	0.7
QXPS4025S25+A	25	20.1	0.8	1.1	41.7	42	48	0.6
MQX-＊016-M8	16	11.2	0.8	2.3	19.9	24	30	0.7
MQX-＊017-M8	17	12.2	0.8	2	22.9	26	32	0.7
MQX-＊020-M10	20	15.1	0.8	1.5	30.6	32	38	0.7
MQX-＊021-M10	21	16.1	0.8	1.4	32.7	34	40	0.7
MQX-＊025-M12	25	20.1	0.8	1.1	41.7	42	48	0.6
MQX-＊026-M12	26	21.1	0.8	1	45.8	44	50	0.6
MQX-＊028-M12	28	23.1	0.8	0.9	50.9	48	54	0.6
MQX-＊030-M16	30	25.1	0.8	0.85	53.9	52	58	0.6
MQX-＊032-M16	32	27.1	0.8	0.75	61.1	56	62	0.6
MQX-＊035-M16	35	30.1	0.8	0.65	70.5	62	68	0.6
MQX-＊040-M16	40	35.1	0.8	0.55	83.3	72	78	0.7
MQX-＊042-M16	42	37.1	0.8	0.55	83.3	76	82	0.7

EPMW100312ZTR

Cat.No.	Tool dia.	Effective Cutting dia.	Max.depth of cut : ap	Ramping		Helical interpolation		Max.drilling depth Z(mm)
				Max.ramping angle θ	Max.depth of cut (ap) Total cutting length L (mm)	Min.Bore dia.	Max.Bore dia.	
QXP-＊040R-16	40	34.1	1	0.4	143.2	70	78	0.6
QXP-＊050R-＊＊	50	44.1	1	0.3	191	90	98	0.6
QXP-8052R-22	52	46.1	1	0.25	229.2	94	102	0.6
QXP-8063R-＊＊	63	57.1	1	0.2	286.5	116	124	0.6
QXP-8066R-＊＊	66	60.1	1	0.2	286.5	122	130	0.6
QXPS2016S16+A	16	10.2	0.8	1.7	27	22	30	0.6
QXPS3020S20+A	20	14.1	0.8	1.3	35.3	30	38	0.6
QXPS4025S25+A	25	19.1	0.8	0.9	50.9	40	48	0.6
MQX-＊016-M8	16	10.2	0.8	1.7	27	22	30	0.6
MQX-＊017-M8	17	11.2	0.8	1.5	30.6	24	32	0.6
MQX-＊020-M10	20	14.1	0.8	1.3	35.3	30	38	0.6
MQX-＊021-M10	21	15.1	0.8	1.2	38.2	32	40	0.6
MQX-＊025-M12	25	19.1	0.8	0.9	50.9	40	48	0.6
MQX-＊026-M12	26	20.1	0.8	0.85	53.9	42	50	0.6
MQX-＊028-M12	28	22.1	0.8	0.75	61.1	46	54	0.6
MQX-＊030-M16	30	24.1	0.8	0.7	65.5	50	58	0.5
MQX-＊032-M16	32	26.1	0.8	0.6	76.4	54	62	0.5
MQX-＊035-M16	35	29.1	0.8	0.5	91.7	60	68	0.5
MQX-＊040-M16	40	34.1	0.8	0.4	114.6	70	78	0.6
MQX-＊042-M16	42	36.2	0.8	0.35	131	74	82	0.6

■ Recommended Data for Profile Milling

■ EPHW100316ZTR

Cat.No.	Tool dia.	Effective Cutting dia.	Max.depth of cut : ap	Ramping		Helical interpolation		Max.drilling depth Z(mm)
				Max.ramping angle θ	Max.depth of cut (ap) Total cutting length L (mm)	Min.Bore dia.	Max.Bore dia.	
QXP-＊040R-16	40	34.1	0.6	0.3	114.6	70	78	0.6
QXP-＊050R-＊＊	50	44.1	0.6	0.2	171.9	90	98	0.6
QXP-8052R-22	52	46.1	0.6	0.2	171.9	94	102	0.6
QXP-8063R-＊＊	63	57.1	0.6	0.15	229.2	116	124	0.6
QXP-8066R-＊＊	66	60.1	0.6	0.15	229.2	122	130	0.6
QXPS2016S16+A	16	10.2	0.6	1.1	31.2	22	30	0.6
QXPS3020S20+A	20	14.1	0.6	0.8	43	30	38	0.6
QXPS4025S25+A	25	19.1	0.6	0.55	62.5	40	48	0.6
MQX-＊016-M8	16	10.2	0.6	1.1	31.2	22	30	0.6
MQX-＊017-M8	17	11.2	0.6	1	34.4	24	32	0.6
MQX-＊020-M10	20	14.1	0.6	0.8	43	30	38	0.6
MQX-＊021-M10	21	15.1	0.6	0.7	49.1	32	40	0.6
MQX-＊025-M12	25	19.1	0.6	0.55	62.5	40	48	0.6
MQX-＊026-M12	26	20.1	0.6	0.5	68.8	42	50	0.6
MQX-＊028-M12	28	22.1	0.6	0.45	76.4	46	54	0.6
MQX-＊030-M16	30	24.1	0.6	0.4	85.9	50	58	0.5
MQX-＊032-M16	32	26.1	0.6	0.4	85.9	54	62	0.5
MQX-＊035-M16	35	29.1	0.6	0.35	98.2	60	68	0.5
MQX-＊040-M16	40	34.1	0.6	0.3	114.6	70	78	0.6
MQX-＊042-M16	42	36.2	0.6	0.25	137.5	74	82	0.6

■ ZPMT100304ZER-**

Cat.No.	Tool dia.	Effective Cutting dia.	Max.depth of cut : ap	Ramping		Helical interpolation		Max.drilling depth Z(mm)
				Max.ramping angle θ	Max.depth of cut (ap) Total cutting length L (mm)	Min.Bore dia.	Max.Bore dia.	
QXP-＊040R-16	40	39	1	0.95	60.3	75.6	78.4	0.6
QXP-＊050R-＊＊	50	49	1	0.7	81.8	95.6	98.4	0.6
QXP-8052R-22	52	51	1	0.65	88.1	99.6	102.4	0.6
QXP-8063R-＊＊	63	62	1	0.55	104.2	121.6	124.4	0.6
QXP-8066R-＊＊	66	65	1	0.5	114.6	127.6	130.4	0.6
QXPS2016S16+A	16	15	0.8	3	15.3	27.6	30.4	0.6
QXPS3020S20+A	20	19	0.8	2.4	19.1	35.6	38.4	0.6
QXPS4025S25+A	25	24	0.8	1.7	27	45.6	48.4	0.6
MQX-＊016-M8	16	15	0.8	3	15.3	27.6	30.4	0.6
MQX-＊017-M8	17	16	0.8	3.2	14.3	29.6	32.4	0.6
MQX-＊020-M10	20	19	0.8	2.4	19.1	35.6	38.4	0.6
MQX-＊021-M10	21	20	0.8	2.2	20.8	37.6	40.4	0.6
MQX-＊025-M12	25	24	0.8	1.7	27	45.6	48.4	0.6
MQX-＊026-M12	26	25	0.8	1.6	28.6	47.6	50.4	0.6
MQX-＊028-M12	28	27	0.8	1.5	30.6	51.6	54.4	0.6
MQX-＊030-M16	30	29	0.8	1.3	35.3	55.6	58.4	0.5
MQX-＊032-M16	32	31	0.8	1.2	38.2	59.6	62.4	0.5
MQX-＊035-M16	35	34	0.8	1.1	41.7	65.6	68.4	0.5
MQX-＊040-M16	40	39	0.8	0.95	48.2	75.6	78.4	0.6
MQX-＊042-M16	42	41	0.8	0.85	53.9	79.6	82.4	0.6

■ Recommended Data for Profile Milling

■ ZPMT100308ZER-**

Cat.No.	Tool dia.	Effective Cutting dia.	Max.depth of cut : ap	Ramping		Helical interpolation		Max.drilling depth Z(mm)
				Max.ramping angle θ	Max.depth of cut (ap) Total cutting length L (mm)	Min.Bore dia.	Max.Bore dia.	
QXP-＊040R-16	40	38.2	1	0.95	60.3	74.8	77.6	0.6
QXP-＊050R-＊＊	50	48.2	1	0.7	81.8	94.8	97.6	0.6
QXP-8052R-22	52	50.2	1	0.65	88.1	98.8	101.6	0.6
QXP-8063R-＊＊	63	61.2	1	0.55	104.2	120.8	123.6	0.6
QXP-8066R-＊＊	66	64.2	1	0.5	114.6	126.8	129.6	0.6
QXPS2016S16+A	16	14.2	0.8	3	15.3	26.8	29.6	0.6
QXPS3020S20+A	20	18.2	0.8	2.4	19.1	34.8	37.6	0.6
QXPS4025S25+A	25	23.2	0.8	1.7	27	44.8	47.6	0.6
MQX-＊016-M8	16	14.2	0.8	3	15.3	26.8	29.6	0.6
MQX-＊017-M8	17	15.2	0.8	3.2	14.3	28.8	31.6	0.6
MQX-＊020-M10	20	18.2	0.8	2.4	19.1	34.8	37.6	0.6
MQX-＊021-M10	21	19.2	0.8	2.2	20.8	36.8	39.6	0.6
MQX-＊025-M12	25	23.2	0.8	1.7	27	44.8	47.6	0.6
MQX-＊026-M12	26	24.2	0.8	1.6	28.6	46.8	49.6	0.6
MQX-＊028-M12	28	26.2	0.8	1.5	30.6	50.8	53.6	0.6
MQX-＊030-M16	30	28.2	0.8	1.3	35.3	54.8	57.6	0.5
MQX-＊032-M16	32	30.2	0.8	1.2	38.2	58.8	61.6	0.5
MQX-＊035-M16	35	33.2	0.8	1.1	41.7	64.8	67.6	0.5
MQX-＊040-M16	40	38.2	0.8	0.95	48.2	74.8	77.6	0.6
MQX-＊042-M16	42	40.2	0.8	0.85	53.9	78.8	81.6	0.6

■ ZPMT100320ZER-**

Cat.No.	Tool dia.	Effective Cutting dia.	Max.depth of cut : ap	Ramping		Helical interpolation		Max.drilling depth Z(mm)
				Max.ramping angle θ	Max.depth of cut (ap) Total cutting length L (mm)	Min.Bore dia.	Max.Bore dia.	
QXP-＊040R-16	40	35.8	1	0.95	60.3	70	75.2	0.6
QXP-＊050R-＊＊	50	45.8	1	0.7	81.8	90	95.2	0.6
QXP-8052R-22	52	47.8	1	0.65	88.1	94	99.2	0.6
QXP-8063R-＊＊	63	58.8	1	0.55	104.2	116	121.2	0.6
QXP-8066R-＊＊	66	61.8	1	0.5	114.6	122	127.2	0.6
QXPS2016S16+A	16	11.8	0.8	3	15.3	22	27.2	0.6
QXPS3020S20+A	20	15.8	0.8	2.4	19.1	30	35.2	0.6
QXPS4025S25+A	25	20.8	0.8	1.7	27	40	45.2	0.6
MQX-＊016-M8	16	11.8	0.8	3	15.3	22	27.2	0.6
MQX-＊017-M8	17	12.8	0.8	3.2	14.3	24	29.2	0.6
MQX-＊020-M10	20	15.8	0.8	2.4	19.1	30	35.2	0.6
MQX-＊021-M10	21	16.8	0.8	2.2	20.8	32	37.2	0.6
MQX-＊025-M12	25	20.8	0.8	1.7	27	40	45.2	0.6
MQX-＊026-M12	26	21.8	0.8	1.6	28.6	42	47.2	0.6
MQX-＊028-M12	28	23.8	0.8	1.5	30.6	46	51.2	0.6
MQX-＊030-M16	30	25.8	0.8	1.3	35.3	50	55.2	0.5
MQX-＊032-M16	32	27.8	0.8	1.2	38.2	54	59.2	0.5
MQX-＊035-M16	35	30.8	0.8	1.1	41.7	60	65.2	0.5
MQX-＊040-M16	40	35.8	0.8	0.95	48.2	70	75.2	0.6
MQX-＊042-M16	42	37.8	0.8	0.85	53.9	74	79.2	0.6

■ Recommended Data for Profile Milling

■ YPHW100303ZER-15

Cat.No.	Tool dia.	Effective Cutting dia.	Max.depth of cut : ap	Ramping		Helical interpolation		Max.drilling depth Z(mm)
				Max.ramping angle θ	Max.depth of cut (ap) Total cutting length L (mm)	Min.Bore dia.	Max.Bore dia.	
QXP-＊040R-16	40	39.3	0.3	1	17.2	77	78.7	0.3
QXP-＊050R-＊＊	50	49.3	0.3	0.75	22.9	97	98.7	0.3
QXP-8052R-22	52	51.3	0.3	0.7	24.6	101	102.7	0.3
QXP-8063R-＊＊	63	62.3	0.3	0.6	28.6	123	124.7	0.3
QXP-8066R-＊＊	66	65.3	0.3	0.55	31.3	129	130.7	0.3
QXPS2016S16+A	16	15.3	0.3	1.3	13.2	29	30.7	0.2
QXPS3020S20+A	20	19.3	0.3	2.1	8.2	37	38.7	0.3
QXPS4025S25+A	25	24.3	0.3	1.8	9.5	47	48.7	0.3
MQX-＊016-M8	16	15.3	0.3	1.3	13.2	29	30.7	0.2
MQX-＊017-M8	17	16.3	0.3	1.7	10.1	31	32.7	0.3
MQX-＊020-M10	20	19.3	0.3	2.1	8.2	37	38.7	0.3
MQX-＊021-M10	21	20.3	0.3	2.4	7.2	39	40.7	0.3
MQX-＊025-M12	25	24.3	0.3	1.8	9.5	47	48.7	0.3
MQX-＊026-M12	26	25.3	0.3	1.7	10.1	49	50.7	0.3
MQX-＊028-M12	28	27.3	0.3	1.6	10.7	53	54.7	0.3
MQX-＊030-M16	30	29.3	0.3	1.4	12.3	57	58.7	0.3
MQX-＊032-M16	32	31.3	0.3	1.3	13.2	61	62.7	0.3
MQX-＊035-M16	35	34.3	0.3	1.2	14.3	67	68.7	0.3
MQX-＊040-M16	40	39.3	0.3	1	17.2	77	78.7	0.3
MQX-＊042-M16	42	41.3	0.3	0.9	19.1	81	82.7	0.3

■ YPHW100308ZER-15

Cat.No.	Tool dia.	Effective Cutting dia.	Max.depth of cut : ap	Ramping		Helical interpolation		Max.drilling depth Z(mm)
				Max.ramping angle θ	Max.depth of cut (ap) Total cutting length L (mm)	Min.Bore dia.	Max.Bore dia.	
QXP-＊040R-16	40	38.3	0.3	1	17.2	75	77.7	0.3
QXP-＊050R-＊＊	50	48.3	0.3	0.75	22.9	95	97.7	0.3
QXP-8052R-22	52	50.3	0.3	0.7	24.6	99	101.7	0.3
QXP-8063R-＊＊	63	61.3	0.3	0.6	28.6	121	123.7	0.3
QXP-8066R-＊＊	66	64.3	0.3	0.55	31.3	127	129.7	0.3
QXPS2016S16+A	16	14.3	0.3	1.4	12.3	27	29.7	0.2
QXPS3020S20+A	20	18.3	0.3	2.2	7.8	35	37.7	0.3
QXPS4025S25+A	25	23.3	0.3	1.9	9	45	47.7	0.3
MQX-＊016-M8	16	14.3	0.3	1.4	12.3	27	29.7	0.2
MQX-＊017-M8	17	15.3	0.3	1.8	9.5	29	31.7	0.3
MQX-＊020-M10	20	18.3	0.3	2.2	7.8	35	37.7	0.3
MQX-＊021-M10	21	19.3	0.3	2.5	6.9	37	39.7	0.3
MQX-＊025-M12	25	23.3	0.3	1.9	9	45	47.7	0.3
MQX-＊026-M12	26	24.3	0.3	1.8	9.5	47	49.7	0.3
MQX-＊028-M12	28	26.3	0.3	1.7	10.1	51	53.7	0.3
MQX-＊030-M16	30	28.3	0.3	1.5	11.5	55	57.7	0.3
MQX-＊032-M16	32	30.3	0.3	1.4	12.3	59	61.7	0.3
MQX-＊035-M16	35	33.3	0.3	1.2	14.3	65	67.7	0.3
MQX-＊040-M16	40	38.3	0.3	1	17.2	75	77.7	0.3
MQX-＊042-M16	42	40.3	0.3	0.9	19.1	79	81.7	0.3

■ Recommended Data for Profile Milling

■ YPHW100320ZER-24

Cat.No.	Tool dia.	Effective Cutting dia.	Max.depth of cut : ap	Ramping		Helical interpolation		Max.drilling depth Z(mm)
				Max.ramping angle θ	Max.depth of cut (ap) Total cutting length L (mm)	Min.Bore dia.	Max.Bore dia.	
QXP-＊040R-16	40	35.9	0.3	1.1	15.6	70.2	75.3	0.3
QXP-＊050R-＊＊	50	45.9	0.3	0.9	19.1	90.2	95.3	0.3
QXP-8052R-22	52	47.9	0.3	0.85	20.2	94.2	99.3	0.3
QXP-8063R-＊＊	63	58.9	0.3	0.65	26.4	116.2	121.3	0.3
QXP-8066R-＊＊	66	61.9	0.3	0.65	26.4	122.2	127.3	0.3
QXPS2016S16+A	16	11.9	0.3	1.9	9	22.2	27.3	0.3
QXPS3020S20+A	20	15.9	0.3	2.5	6.9	30.2	35.3	0.3
QXPS4025S25+A	25	20.9	0.3	2.2	7.8	40.2	45.3	0.3
MQX-＊016-M8	16	11.9	0.3	1.9	9	22.2	27.3	0.3
MQX-＊017-M8	17	12.9	0.3	2.2	7.8	24.2	29.3	0.3
MQX-＊020-M10	20	15.9	0.3	2.5	6.9	30.2	35.3	0.3
MQX-＊021-M10	21	16.9	0.3	2.8	6.1	32.2	37.3	0.3
MQX-＊025-M12	25	20.9	0.3	2.2	7.8	40.2	45.3	0.3
MQX-＊026-M12	26	21.9	0.3	2	8.6	42.2	47.3	0.3
MQX-＊028-M12	28	23.9	0.3	1.8	9.5	46.2	51.3	0.3
MQX-＊030-M16	30	25.9	0.3	1.6	10.7	50.2	55.3	0.3
MQX-＊032-M16	32	27.9	0.3	1.5	11.5	54.2	59.3	0.3
MQX-＊035-M16	35	30.9	0.3	1.4	12.3	60.2	65.3	0.3
MQX-＊040-M16	40	35.9	0.3	1.1	15.6	70.2	75.3	0.3
MQX-＊042-M16	42	37.9	0.3	1.1	15.6	74.2	79.3	0.3

■Recommended Cutting Conditions

Material		High Feed		Shoulder Milling	Side Finishing	Bottom Finishing
		EPMT / EPMW	EPHW	ZPMT		
Carbon Steel below 250HB	Grade	JC7560 (JC8050 JC8118)	-	JC8050 (JC8118)	JC8050 (JC8118)	JC8050 (JC8118)
	Vc	130 - 180	-	130 - 160	190 - 320	90 - 180
	fz	0.7 - 0.9	-	0.12 - 0.15	0.18 - 0.30	0.1 - 0.15
	ap	0.4 - 1.0	-	~5.0	~5.0	~0.2
	ae	0.7 Dc	-	~0.16 Dc	~0.2	0.4 - 1.0 Dc
Tool & Die Steel below 255HB	Grade	JC7560 (JC8050 JC8118)	-	JC8050 (JC8118)	JC8050 (JC8118)	JC8050 (JC8118)
	Vc	130 - 180	-	120 - 150	180 - 300	80 - 160
	fz	0.7 - 0.9	-	0.12 - 0.15	0.15 - 0.25	0.1 - 0.15
	ap	0.4 - 1.0	-	~5.0	~5.0	~0.2
	ae	0.7 Dc	-	~0.16 Dc	~0.2	0.4 - 1.0 Dc
Mold Steel 30-36HRC	Grade	JC8118 (JC7560 JC8050)	-	JC8118 (JC8050)	JC8118 (JC8050)	JC8118 (JC8050)
	Vc	130 - 180	-	120 - 150	180 - 300	80 - 160
	fz	0.7 - 1.0	-	0.12 - 0.15	0.15 - 0.25	0.1 - 0.15
	ap	0.4 - 1.0	-	~5.0	~5.0	~0.2
	ae	0.7 Dc	-	~0.16 Dc	~0.2	0.4 - 1.0 Dc
Mold Steel 38-43HRC	Grade	JC8118 (JC8050)	-	JC8118 (JC8050)	JC8118 (JC8050)	JC8118 (JC8050)
	Vc	70 - 100	-	100 - 120	150 - 250	70 - 140
	fz	0.6 - 0.7	-	0.1 - 0.12	0.15 - 0.25	0.1 - 0.15
	ap	0.3 - 0.8	-	~4.0	~4.0	~0.2
	ae	0.6 Dc	-	~0.15 Dc	~0.2	0.4 - 1.0 Dc
Hardened Die Steel 42-52HRC	Grade	JC8118	JC8118	JC8118 (DH102)	JC8118 (DH102)	JC8118 (DH102)
	Vc	60 - 70	70 - 90	80 - 100	120 - 210	75 - 100
	fz	0.5	0.5 - 0.8	0.09 - 0.12	0.12 - 0.20	0.1 - 0.12
	ap	0.2 - 0.6	0.1 - 0.3	~3.5	~3.5	~0.2
	ae	0.6 Dc	0.6 Dc	~0.14 Dc	~0.2	0.4 -1.0 Dc
Hardened Die Steel 55-62HRC	Grade	-	DH102	DH102	DH102	DH102
	Vc	-	60 - 80	50 - 70	100 - 180	50 - 70
	fz	-	0.2 - 0.3	0.1	0.09 - 0.15	0.08 - 0.1
	ap	-	0.1 - 0.2	~2.5	~2.5	~0.15
	ae	-	0.4 Dc	~0.14 Dc	~0.15	0.4 - 1.0 Dc
Grey & Nodular Cast Iron below 300HB	Grade	JC8118	-	JC8118 (DH102)	JC8118 (DH102)	JC8118 (DH102)
	Vc	110 - 150	-	120 - 150	160 - 280	90 - 180
	fz	0.8 - 1.2	-	0.16 - 0.2	0.18 - 0.30	0.12 - 0.18
	ap	0.4 - 1.0	-	~5.0	~5.0	~0.2
	ae	0.7 Dc	-	~0.2 Dc	~0.2	0.4 -1.0 Dc
Stainless Steel	Grade	JC8050 (JC7560)	-	JC8050 (JC8118 JC7518)	JC8050 (JC8118 JC7518)	JC8050 (JC8118 JC7518)
	Vc	130 - 150	-	120 - 150	180 - 300	80 - 160
	fz	0.6 - 0.8	-	0.12 - 0.15	0.15 - 0.25	0.1 - 0.15
	ap	0.3 - 0.8	-	~5.0	~5.0	~0.2
	ae	0.6 Dc	-	~0.16 Dc	~0.2	0.4 - 1.0 Dc
Titanium Alloy	Grade	DS150 (JC8050 DS118)	-	DS118 (JC7518)	DS118 (JC7518)	DS118 (JC7518)
	Vc	50 - 60	-	50 - 60	60 - 100	25 - 50
	fz	0.4	-	0.12 - 0.15	0.15 - 0.25	0.1 - 0.12
	ap	0.2 - 0.8	-	~5.0	~5.0	~0.2
	ae	0.6 Dc	-	~0.15 Dc	~0.2	0.4 - 1.0 Dc
Heat Resistant Alloy	Grade	JC8118 (JC8050)	-	JC7518	JC7518	JC7518
	Vc	20 - 30	-	25 - 30	30 - 50	15 - 30
	fz	0.3	-	0.11 - 0.15	0.15 - 0.25	0.1 - 0.12
	ap	0.2 - 0.8	-	~5.0	~5.0	~0.2
	ae	0.6 Dc	-	~0.15 Dc	~0.20	0.4 - 1.0 Dc
Aluminium	Grade	-	-	FC18	FC18	FC18
	Vc	-	-	300 - 600	420 - 700	300 - 600
	fz	-	-	0.16 - 0.2	0.18 - 0.30	0.1 - 0.15
	ap	-	-	~5.0	~5.0	~0.3
	ae	-	-	~0.4 Dc	~0.3	0.4 - 1.0 Dc

■Recommended Cutting Conditions

Material		Contouring	Side Finishing	Bottom Finishing	Vertical Side Finishing	Side Finishing	Bottom Finishing	Vertical Side Finishing
		YPHW-24	YPHW-15			YPHW-F (CBN)		
Carbon Steel below 250HB	Grade	-	JC8015 (DH102)	DH102	JC8015 (DH102)	-	-	-
	Vc	-	450 - 650	170 - 260	350 - 450	-	-	-
	fz	-	0.1 - 0.15	0.18 - 0.25	0.08 - 0.18	-	-	-
	ap	-	0.7 - 2.0	~0.2	Pf 0.5 - 1.12	-	-	-
	ae	-	~0.2	~0.6 Dc	~0.2	-	-	-
Tool & Die Steel below 255HB	Grade	-	JC8015 (DH102)	DH102	JC8015 (DH102)	-	-	-
	Vc	-	350 - 450	150 - 240	300 - 400	-	-	-
	fz	-	0.1 - 0.15	0.18 - 0.25	0.08 - 0.18	-	-	-
	ap	-	0.7 - 2.0	~0.2	Pf 0.5 - 1.12	-	-	-
	ae	-	~0.2	~0.6 Dc	~0.2	-	-	-
Mold Steel 30-36HRC	Grade	-	JC8015 (DH102)	DH102	JC8015 (DH102)	-	-	-
	Vc	-	350 - 450	140 - 220	250 - 350	-	-	-
	fz	-	0.1 - 0.15	0.17 - 0.2	0.07 - 0.15	-	-	-
	ap	-	0.7 - 2.0	~0.2	Pf 0.5 - 1.12	-	-	-
	ae	-	~0.2	~0.6 Dc	~0.2	-	-	-
Mold Steel 38-43HRC	Grade	JC8015 (DH102)	JC8015 (DH102)	DH102	JC8015 (DH102)	-	-	-
	Vc	220	350 - 400	150 - 200	180 - 250	-	-	-
	fz	0.25	0.08 - 0.12	0.1 - 0.12	0.07 - 0.12	-	-	-
	ap	0.15 - 0.4	0.7 - 2.0	~0.2	Pf 0.5 - 1.12	-	-	-
	ae	~0.4 Dc	~0.2	~0.6 Dc	~0.2	-	-	-
Hardened Die Steel 42-52HRC	Grade	JC8015 (DH102)	JC8015 (DH102)	DH102	DH102 (JC8015)	JBN795	JBN795	JBN795
	Vc	160	170 - 200	60 - 100	120 - 170	400 - 450	300 - 350	400 - 450
	fz	0.25	0.08 - 0.1	0.1	0.06 - 0.1	0.07 - 0.08	0.06 - 0.08	0.07 - 0.08
	ap	0.1 - 0.25	~1.5	~0.2	Pf 0.5 - 1.12	~1.2	~0.08	Pf 0.5 - 1.12
	ae	~0.4 Dc	~0.2	~0.6 Dc	~0.15	~0.1	~0.6 Dc	~0.1
Hardened Die Steel 55-62HRC	Grade	DH102	DH102	DH102	-	JBN795	JBN795	-
	Vc	100	150 - 180	50 - 70	-	300 - 400	200	-
	fz	0.2	0.08 - 0.1	0.05 - 0.07	-	0.06 - 0.08	0.05 - 0.06	-
	ap	0.1 - 0.2	~1.0	~0.2	-	~1.2	~0.06	-
	ae	~0.3 Dc	~0.2	~0.4 Dc	-	~0.1	~0.6 Dc	-
Grey Cast Iron	Grade	-	JC8015 (DH102)	DH102	JC8015 (DH102)	JBN795	JBN795	JBN795
	Vc	-	450 - 550	130 - 200	450 - 550	750	700	750
	fz	-	0.1 - 0.15	0.1 - 0.2	0.1 - 0.15	0.1 - 0.135	0.1 - 0.12	0.1 - 0.135
	ap	-	0.7 - 2.0	~0.2	Pf 0.5 - 1.12	~1.5	~0.1	Pf 0.5 - 1.12
	ae	-	~0.2	~0.6 Dc	~0.2	~0.1	~0.6 Dc	~0.1
Nodular Cast Iron	Grade	-	JC8015 (DH102)	DH102	JC8015 (DH102)	JBN795	-	JBN795
	Vc	-	450 - 550	130 - 200	450 - 550	700	-	700
	fz	-	0.1 - 0.15	0.1 - 0.2	0.1 - 0.15	0.1 - 0.135	-	0.1 - 0.135
	ap	-	0.7 - 2.0	~0.2	Pf 0.5 - 1.12	~1.5	-	Pf 0.5
	ae	-	~0.2	~0.6 Dc	~0.2	~0.1	-	~0.1
Stainless Steel	Grade	-	JC8015 (DH102)	JC8015 (DH102)	-	-	-	-
	Vc	-	350 - 450	130 - 180	-	-	-	-
	fz	-	0.1 - 0.15	0.1 - 0.15	-	-	-	-
	ap	-	0.7 - 2.0	~0.2	-	-	-	-
	ae	-	~0.2	~0.6 Dc	-	-	-	-
Titanium Alloy	Grade	-	JC8015 (DH102)	DH102	-	-	-	-
	Vc	-	70 - 90	30 - 50	-	-	-	-
	fz	-	0.08 - 0.12	0.1 - 0.15	-	-	-	-
	ap	-	0.7 - 2.0	~0.2	-	-	-	-
	ae	-	~0.2	~0.6 Dc	-	-	-	-

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use air blow.
5. When using Endmill type, reduce cutting conditions by 10-20%.

QM MILL — MPM/PME Type

Low cutting force geometry

- Unique 3D geometry insert provides stable cutting and less power consumption.
- BT30 Capable of running on low horse power & compact machines.

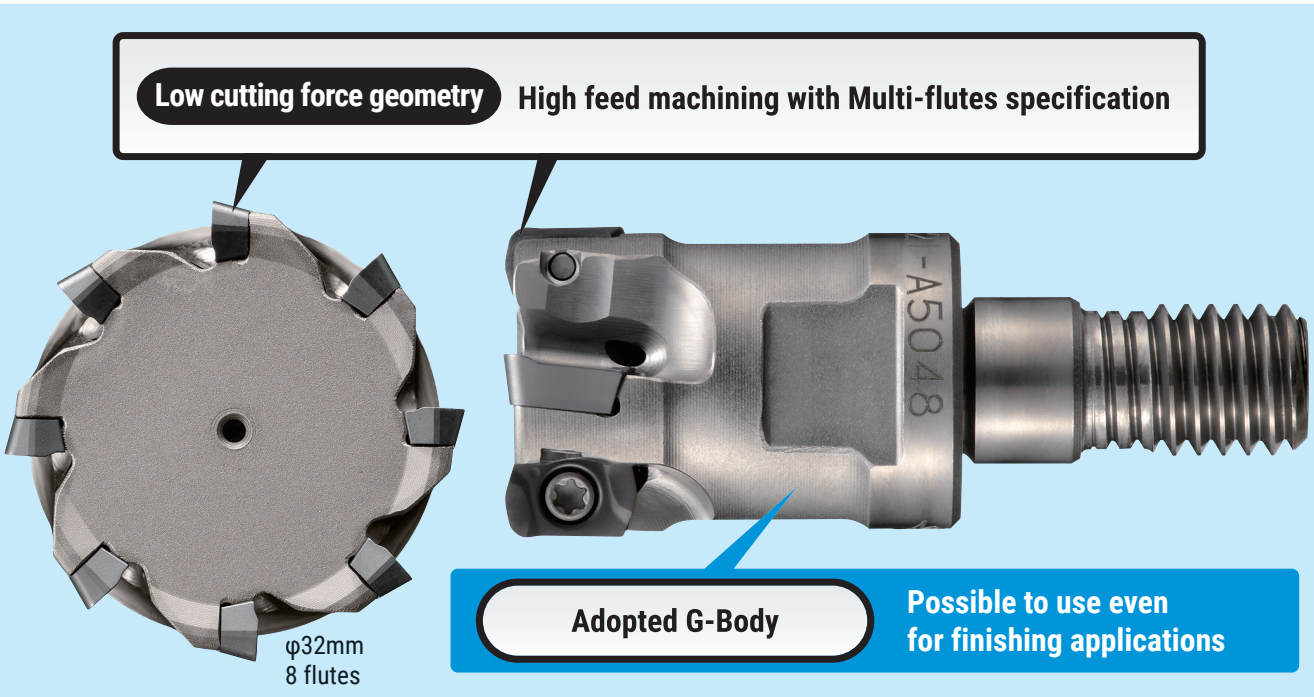
G - Body

Multi - flutes specification

- High speed and high efficient machining.

Vibration free

- Control vibration with combination of MSN carbide shank holder for longer tool life.



Insert Line-Up

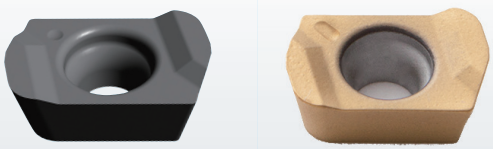
A variety of inserts all fit into the same body.

High feed insert



EOMT0602...ZER (R1.0, 2.0)

High feed insert for unfavorable conditions



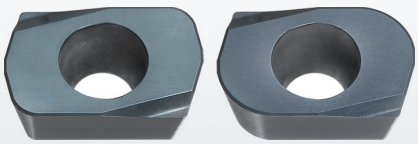
EOMW060210ZER

Shoulder insert



ZOMT0602...ZER-PL (R0.2,0.4,0.8)

For high hardened steel



EOHW0602...ZTR (R1.0, 2.0)

"Mirror Insert" for finishing side & bottom face



YOHW0602...ZER-12

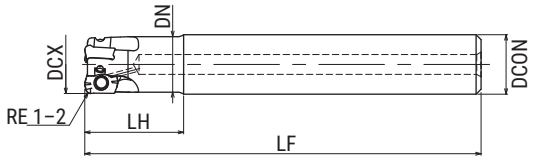


PME TYPE — Shank Type

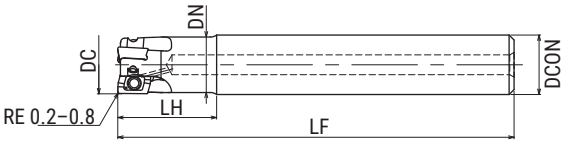


■ PME type (Through coolant hole)

●High feed

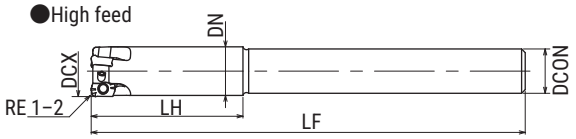


●Shoulder milling

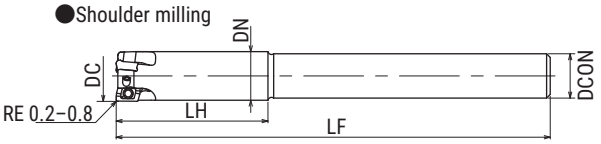


■ PME-LS type (No coolant hole)

●High feed



●Shoulder milling



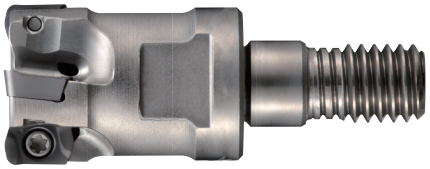
Type	Cat.No.	Stock	No. of inserts	Dimensions (mm)					Insert
				DCX	LH	LF	DN	DCON	
Standard	PME2010S10	●	2	10	20	80	9.3	10	EO**0602**Z*R ZOMT0602**ZER YOHW0602**ZER-12
	PME3012S12	●	3	12			11.2	12	
	PME3014S12	●		14			13.15		
Long shank	PME2011S10-LS	●	2	11	33	120	10.3	10	
	PME3013S12-LS	●	3	13	39		12.2	12	
	PME3014S12-LS	●		14	42		13.15		

Screw	Torque(N.m)	Wrench
DSW-1840H	0.4	A-06

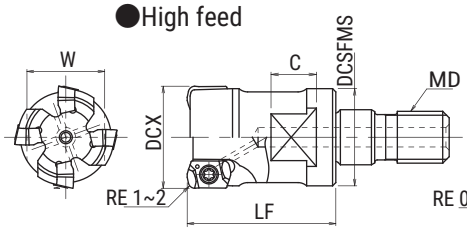
QM MILL — MPM/PME Type

MPM TYPE — Modular Type

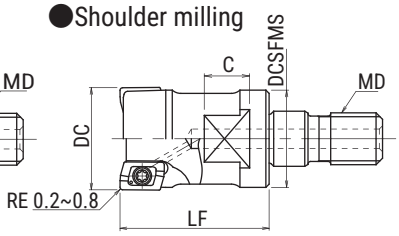
Through coolant hole | G - Body | Face Milling | Shoulder Milling | Slotting | Copy Milling | Pocket Milling | Helical Interpolation



●High feed



●Shoulder milling

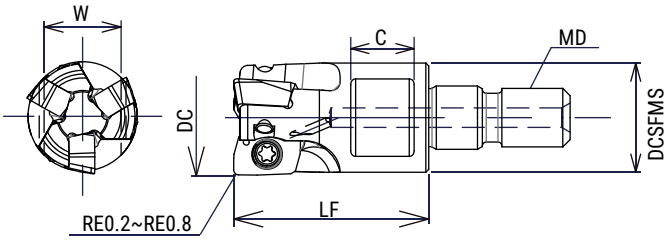


Cat.No.	Stock	No. of inserts	Dimensions (mm)						Insert
			DCX	LF	DCSFMS	MD	C	W	
MPM-2010-M6	●	2	10	18	9.5	M6	6.5	8	EO**0602**Z*R ZOMT0602**ZER YOHW0602**ZER-12
MPM-2011-M6	●		11		9.7	M6			
MPM-3012-M6	●	3	12	20	11.2	M6			
MPM-3013-M6	●		13		11.5	M6			
MPM-3015-M8	○		15	23	14	M8	8	12	
MPM-4016-M8	●	4	16		15	M8			
MPM-4017-M8	●		17			M8			
MPM-4018-M8	○		18			M8			
MPM-5020-M10	●	5	20	30	19	M10	9	14	
MPM-5021-M10	●		21			M10			
MPM-6025-M12	●	6	25	35	23.6	M12	10	17	
MPM-7030-M16	●	7	30	43	29	M16	12	22	
MPM-8032-M16	●	8	32			M16			

MPT TYPE — High Precision "QM MILL"

High tolerance insert-pocket for the ground inserts





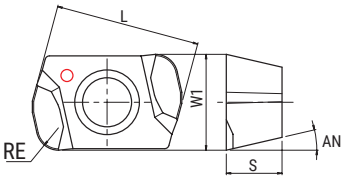
Cat.No.	Stock	No. of inserts	Dimensions (mm)						Insert
			DC	LF	DCSFMS	MD	C	W	
MPT-2010A00-M6	●	2	10	18	9.5	M6	6.5	8	ZOMT0602**ZER YOHW0602**ZER-12
MPT-2011A00-M6	○		11		9.7				
MPT-3012A00-M6	●	3	12	20	11.2				
MPT-3013A00-M6	○		13		11.5				
MPT-4016A00-M8	●	4	16	23	15	M8	8	12	

Screw	Torque(N.m)	Wrench
DSW-1840H	0.4	A-06

Insert

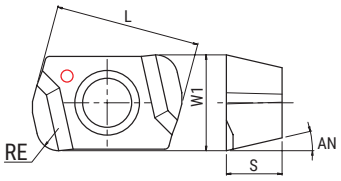
High feed insert



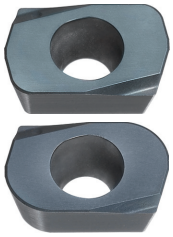


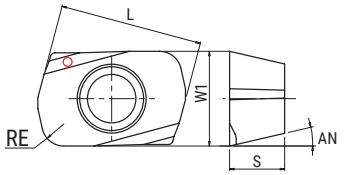
High feed insert for unfavorable conditions





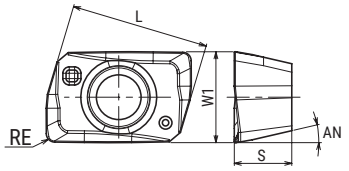
For high hardened steel





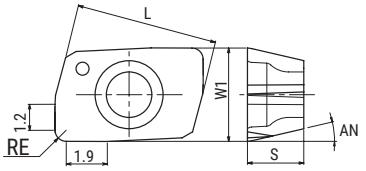
Shoulder insert





"Mirror Insert" for finishing side & bottom face



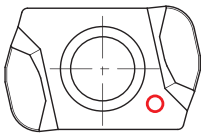


Type	Cat.No.	Tolerance	PVD coating							Dimensions (mm)				
			DH102	DS118	DS150	JC7560	JC8015	JC8050	JC8118	RE	L	W1	S	AN
High feed insert	EOMT060210ZER	M		●	●	●		●	●	1.0	6.5	4.3	2.5	13°
	EOMT060220ZER			●	●			●	●	2.0				
High feed insert for unfavorable conditions	EOMW060210ZER					●		●	●	1.0				
High hardened steel	EOHW060210ZTR	H	●						●	1.0				
	EOHW060220ZTR		●						●	2.0				
Shoulder milling insert	ZOMT060202ZER-PL	M						●	●	0.2	6.62		2.7	
	ZOMT060204ZER-PL							●	●	0.4				
	ZOMT060208ZER-PL							●	●	0.8				
MIRROR INSERT for finishing side & bottom face	YOHW060203ZER-12	H	●				●			0.3	6.5		2.6	
	YOHW060205ZER-12		●				●			0.5				
	YOHW060208ZER-12		●				●			0.8				

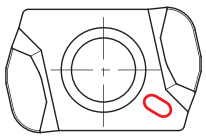
GRADE MARKINGS



JC8118/DS118



JC8050/JC7560/DS150



■ MAGNETIZER



- Magnetizing and demagnetizing a wrench can easily be done by inserting the tip into the magnetizer and rubbing lightly.
- Do not use in the vicinity of the equipment that can be influenced with magnetism.

Cat.No.	Stock
MAGNETISER	○

QM MILL MPM/PME Type

■ Insert selection guide

Material	Carbon steel (S50C, S55C) below 250HB						Tool & die steel (SKD61, SKD11) below 255HB					
Cat.No. \ Grade	JC8118	JC8050	JC7560	DH102	DS118	DS150	JC8118	JC8050	JC7560	DH102	DS118	DS150
EOMT0602*0ZER	☆	☆	☆				☆	☆	☆			
EOMW060210ZER	○	○	◎				○	○	◎			
EOHW0602*0ZTR												

Material	Mold steel (HPM7, PX5, KPM30) 30-36HRC						Mold steel (NAK80, HPM1) 38-43HRC					
Cat.No. \ Grade	JC8118	JC8050	JC7560	DH102	DS118	DS150	JC8118	JC8050	JC7560	DH102	DS118	DS150
EOMT0602*0ZER	☆	☆	☆				☆	☆				
EOMW060210ZER	○	○	◎				◎	○				
EOHW0602*0ZTR												

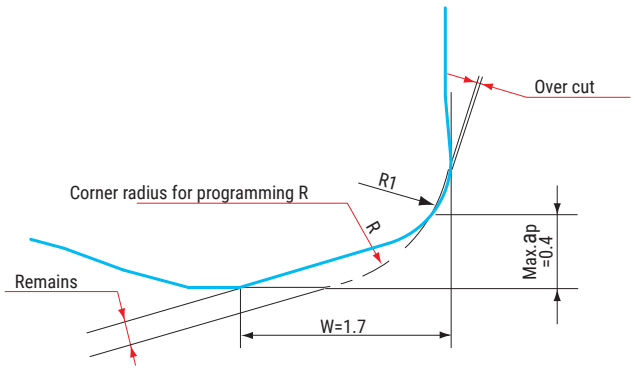
Material	Hardened die steel (SKD61, DAC, DHA) 42-52HRC						Hardened die steel (SKD11, SLD, DC11) 55-62HRC					
Cat.No. \ Grade	JC8118	JC8050	JC7560	DH102	DS118	DS150	JC8118	JC8050	JC7560	DH102	DS118	DS150
EOMT0602*0ZER	☆						×	×				
EOMW060210ZER	○	●					○					
EOHW0602*0ZTR	◎						●			◎		

Material	Cast iron (FC, FCD) below 300HB						Stainless steel (SUS304) below 250HB					
Cat.No. \ Grade	JC8118	JC8050	JC7560	DH102	DS118	DS150	JC8118	JC8050	JC7560	DH102	DS118	DS150
EOMT0602*0ZER	○							◎	○			
EOMW060210ZER	◎		●					●				
EOHW0602*0ZTR												

Material	Titanium alloy (Ti-6Al-4V)						Heat resistant alloy (INCO718)					
Cat.No. \ Grade	JC8118	JC8050	JC7560	DH102	DS118	DS150	JC8118	JC8050	JC7560	DH102	DS118	DS150
EOMT0602*0ZER	○	○	◎		○	◎	◎	○	○		○	○
EOMW060210ZER			●					●				
EOHW0602*0ZTR												

◎: First choice ○: For general milling ●: For unstable milling ☆: For light cutting force ×: Not recommended

■ Definition of corner shape for programming

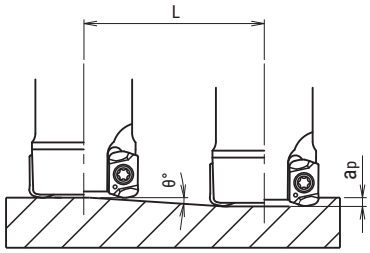


(mm)

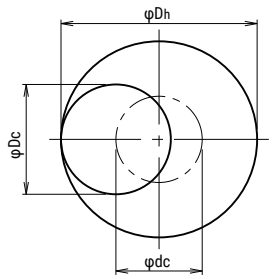
Corner radius for programming R	Over cut	Remains
R1.0 (Std.)	0	0.17
R1.5	0.09	0.08
R2.0	0.30	0

■ Recommended Data for Profile Milling

● Ramping



● Helical interpolation



● Calculation of tool pass dia.

$$\varphi dc = \varphi Dh - \varphi Dc$$

Tool pass dia. Bore dia. Tool Dia.

● Depth of cut per one circuit should not exceed max. depth of cut Ap

● Down cutting is recommended, tool pass rotation should be counterclockwise

● In case of ramping and helical interpolation, apply 70% or less feed (Vf) from standard cutting condition table

● In case of drilling, apply 50% or less Z axis feed (F) from standard cutting condition table

● Long consecutive chips may result in case of drilling, confirm safe operating conditions

Cat.No.	Tool dia. (mm)	Effective cutting dia. (mm)	Max.depth of cut: ap (mm)	Ramping		Helical interpolation	
				Max. ramping angle θ	Max. depth of cut (ap) Total cutting length L(mm)	Min. Bore dia. (mm)	Max. Bore dia. (mm)
MPM-2010-M6	10	6.6	0.3	2°18'	7.5	15	18
MPM-2011-M6	11	7.6	0.3	1°54'	9	17	20
MPM-3012-M6	12	8.5	0.3	1°36'	10.7	19	22
MPM-3013-M6	13	9.5	0.3	1°24'	12.3	21	24
MPM-3015-M8	15	11.5	0.4	1°12'	19.1	25	28
MPM-4016-M8	16	12.5	0.4	1°	22.9	27	30
MPM-4017-M8	17	13.5	0.4	0°54'	25.5	29	32
MPM-4018-M8	18	14.5	0.4	0°51'	27.0	31	34
MPM-5020-M10	20	16.5	0.4	0°45'	30.6	35	38
MPM-5021-M10	21	17.5	0.4	0°42'	32.7	37	40
MPM-6025-M12	25	21.5	0.4	0°30'	45.8	45	48
MPM-7030-M16	30	26.5	0.4	0°27'	50.9	55	58
MPM-8032-M16	32	28.5	0.4	0°24'	57.3	59	62
PME2010S10	10	6.6	0.3	2°18'	7.5	15	18
PME2011S10-LS	11	7.6	0.3	1°54'	9	17	20
PME3012S12	12	8.5	0.3	1°36'	10.7	19	22
PME3013S12-LS	13	9.5	0.3	1°24'	12.3	21	24
PME3014S12(-LS)	14	10.5	0.3	1°18'	13.2	23	26

Recommended Cutting Conditions

Material		High Feed		Side Finishing	Bottom Finishing
		EOMT / EOMW	EOHW	YOHW	YOHW
Carbon Steel below 250HB	Grade	JC7560 (JC8050 JC8118)	-	JC8015 (DH102)	JC8015 (DH102)
	Vc	95 - 120	-	280 - 400	160 - 250
	fz	0.5 - 0.9	-	0.1 - 0.15	0.14 - 0.2
	ap	0.2 - 0.4	-	~1.2	~0.12
	ae	0.7 Dc	-	~0.1	0.6 Dc
Tool & Die Steel below 255HB	Grade	JC7560 (JC8050 JC8118)	-	JC8015 (DH102)	JC8015 (DH102)
	Vc	90 - 110	-	250 - 360	150 - 230
	fz	0.5 - 0.9	-	0.1 - 0.15	0.13 - 0.18
	ap	0.15 - 0.4	-	~1.0	~0.12
	ae	0.7 Dc	-	~0.1	0.6 Dc
Mold Steel 30-36HRC	Grade	JC8118 (JC7560 JC8050)	-	JC8015 (DH102)	JC8015 (DH102)
	Vc	90 - 110	-	250 - 360	150 - 230
	fz	0.5 - 0.9	-	0.1 - 0.15	0.13 - 0.18
	ap	0.2 - 0.4	-	~1.0	~0.12
	ae	0.7 Dc	-	~0.1	0.6 Dc
Mold Steel 38-43HRC	Grade	JC8118 (JC8050)	-	DH102 (JC8015)	DH102 (JC8015)
	Vc	70 - 90	-	200 - 280	130 - 200
	fz	0.5 - 0.7	-	0.08 - 0.12	0.08 - 0.12
	ap	0.2 - 0.3	-	~1.0	~0.12
	ae	0.6 Dc	-	~0.1	0.6 Dc
Hardened Die Steel 42-52HRC	Grade	JC8118	JC8118	DH102 (JC8015)	DH102 (JC8015)
	Vc	50 - 70	70 - 90	140 - 200	90 - 120
	fz	0.45 - 0.6	0.3 - 0.6	0.08 - 0.1	0.08 - 0.1
	ap	0.15 - 0.3	0.1 - 0.25	~0.8	~0.1
	ae	0.6 Dc	0.6 Dc	~0.1	0.4 Dc
Hardened Die Steel 55-62HRC	Grade	-	DH102	DH102	DH102
	Vc	-	70 - 80	100 - 150	50 - 70
	fz	-	0.27 - 0.3	0.08 - 0.1	0.06 - 0.08
	ap	-	0.1 - 0.15	~0.5	~0.1
	ae	-	0.4 Dc	~0.1	0.4 Dc
Grey & Nodular Cast Iron below 300HB	Grade	JC8118	-	JC8015 (DH102)	JC8015 (DH102)
	Vc	120 - 150	-	280 - 400	130 - 200
	fz	0.5 - 0.9	-	0.1 - 0.15	0.1 - 0.15
	ap	0.2 - 0.4	-	~1.2	~0.15
	ae	0.7 Dc	-	~0.12	0.6 Dc
Stainless Steel	Grade	JC8050 (JC7560)	-	JC8015 (DH102)	JC8015 (DH102)
	Vc	95 - 120	-	250 - 360	150 - 230
	fz	0.5 - 0.9	-	0.1 - 0.15	0.13 - 0.18
	ap	0.15 - 0.4	-	~1.0	~0.12
	ae	0.6 Dc	-	~0.1	0.6 Dc
Titanium Alloy	Grade	DS150 (JC7560 JC8050 DS118)	-	JC8015 (DH102)	JC8015 (DH102)
	Vc	50 - 60	-	55 - 80	30 - 50
	fz	0.4 - 0.5	-	0.08 - 0.12	0.09 - 0.12
	ap	0.15 - 0.3	-	~1.0	~0.12
	ae	0.6 Dc	-	~0.1	0.6 Dc
Heat Resistant Alloy	Grade	JC8118 (JC8050)	-	-	-
	Vc	25 - 30	-	-	-
	fz	0.3 - 0.4	-	-	-
	ap	0.15 - 0.3	-	-	-
	ae	0.6 Dc	-	-	-

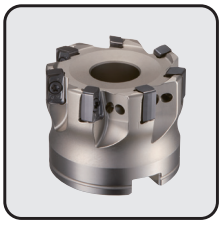
Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use air blow.

■Recommended Cutting Conditions

Material		Shoulder Milling ZOMT	Side Finishing ZOMT	Bottom Finishing ZOMT
Carbon Steel below 250HB	Grade Vc fz ap ae	JC8050 (JC8118) 128 - 160 0.06 - 0.08 ~4.0 ~0.15 Dc	JC8050 (JC8118) 145 - 240 0.07 - 0.13 ~4.0 ~0.1	JC8050 (JC8118) 90 - 180 0.1 - 0.15 ~0.15 ~0.6 Dc
Tool & Die Steel below 255HB	Grade Vc fz ap ae	JC8050 (JC8118) 120 - 150 0.04 - 0.06 ~4.0 ~0.15 Dc	JC8050 (JC8118) 130 - 215 0.07 - 0.13 ~4.0 ~0.1	JC8050 (JC8118) 80 - 160 0.1 - 0.15 ~0.15 ~0.6 Dc
Mold Steel 30-36HRC	Grade Vc fz ap ae	JC8118 (JC8050) 120 - 150 0.03 - 0.05 ~4.0 ~0.15 Dc	JC8118 (JC8050) 130 - 215 0.07 - 0.13 ~4.0 ~0.1	JC8118 (JC8050) 80 - 160 0.1 - 0.15 ~0.15 ~0.6 Dc
Mold Steel 38-43HRC	Grade Vc fz ap ae	JC8118 (JC8050) 90 - 120 0.03 - 0.05 ~3.0 ~0.13 Dc	JC8118 (JC8050) 110 - 185 0.05 - 0.1 ~3.0 ~0.1	JC8118 (JC8050) 70 - 140 0.1 - 0.15 ~0.15 ~0.6 Dc
Hardened Die Steel 42-52HRC	Grade Vc fz ap ae	JC8118 80 - 100 0.03 - 0.05 ~2.5 ~0.12 Dc	JC8118 90 - 120 0.05 - 0.07 ~2.5 ~0.1	JC8118 75 - 100 0.1 - 0.12 ~0.1 ~0.6 Dc
Grey & Nodular Cast Iron below 300HB	Grade Vc fz ap ae	JC8118 120 - 150 0.06 - 0.08 ~4.0 ~0.15 Dc	JC8118 125 - 210 0.07 - 0.15 ~4.0 ~0.1	JC8118 90 - 180 0.12 - 0.18 ~0.15 ~0.6 Dc
Stainless Steel	Grade Vc fz ap ae	JC8050 120 - 150 0.04 - 0.06 ~4.0 ~0.15 Dc	JC8050 130 - 215 0.07 - 0.13 ~4.0 ~0.1	JC8050 80 - 160 0.1 - 0.15 ~0.15 ~0.6 Dc

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use air blow.

EXTREME SAP
EXSAP/MSX TYPE


Facemill type


Modular head type


Shank type

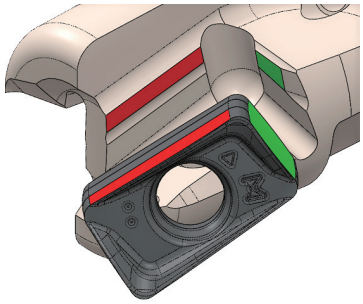
Various line up

Capable of a variety of applications such as facemilling , slotting and plunging

Arc-shaped cutting edge trajectory

Due to the arc-geometry on peripheral cutting edge, cusp height can be smaller even in case of large ap.
Achieves high efficient & high precision machining for side walls.



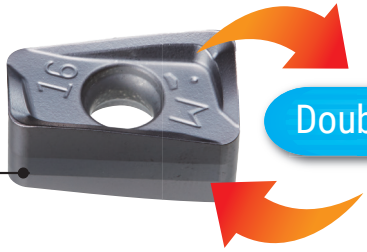


Strong clamping system

Due to unique clamping system that holds insert in place, it is possible to achieve high efficient machining in roughing application.

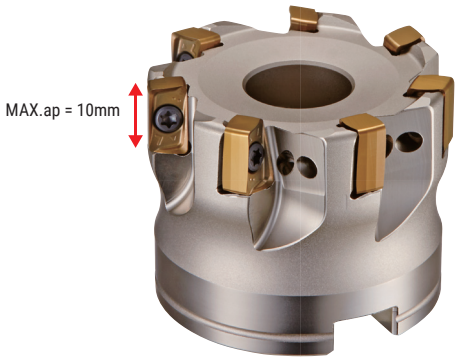
High precision G class periphery ground

capable of semi-finishing



Double sided 4 cutting edge insert

■ EXSAP-11 type



High speed machining
with multi flutes & small insert

Accuracy of tool diameter : 0-0.1mm
Achieves higher precision on semi-finishing process



Grade: JC8050
JC8118

PM breaker for general steel (up to 50HRC)



Grade: JC7550
JC7518
DS118
DS150

SL breaker for hard to cut material
such as Titanium alloy, Heat resistant alloy

■ EXSAP-17 type

Max.depth of cut (ap)=15mm
From roughing to semi-finishing



High rigidity insert
Achieves high precision machining even when using large ap



Grade: JC8050
JC8118

PM breaker for general steel (up to 50HRC)

■ Insert grades

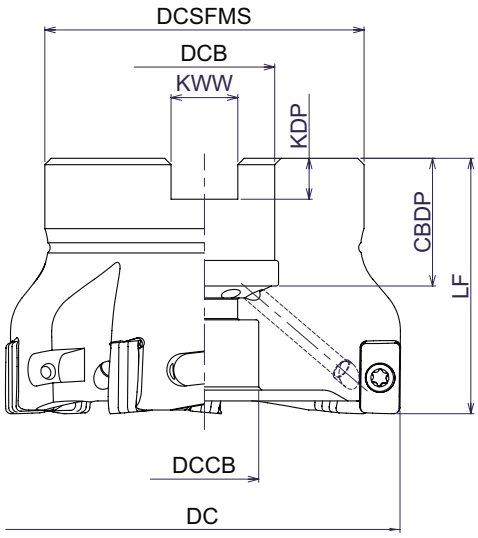
ISO	P					M					K				S				
	P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30	S01	S10	S20	S30	
Range		JC8118					JC8118					JC8118				DS118			
				JC8050					JC8050								DS150		
		JC7518					JC7518											JC7518	
				JC7550					JC7550									JC7550	

EXTREME SAP — EXSAP11/MSX11 Type

EXSAP-11 TYPE — Bore Type

Through coolant hole | Face Milling | Shoulder Milling | Slotting | Helical Interpolation | Plunge Milling





Cat.No.	Stock	No. of inserts	Dimensions (mm)								Arbor set bolt	Weight (kg)	Inserts
			DC	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP			
EXSAP-6040R-11-16	●	6	40	40	35	16	14	8.4	5.6	18	M8	0.22	ZNGU1105**ZER-**
EXSAP-7050R-11-22	●	7	50	40	47	22	16.5	10.4	6.3	20	M10	0.38	
EXSAP-7052R-11-22	●	7	52	40	47	22	16.5	10.4	6.3	20	M10	0.39	
EXSAP-7063R-11-22	●	7	63	40	50	22	17	10.4	6.3	20	M10	0.53	
EXSAP-7063R-11-27	●	7	63	50	50	27	20	12.4	7	22	M12X1.75X30	0.62	
EXSAP-8080R-11-27	●	8	80	50	56	27	20	12.4	7	22	M12X1.75X30	0.99	

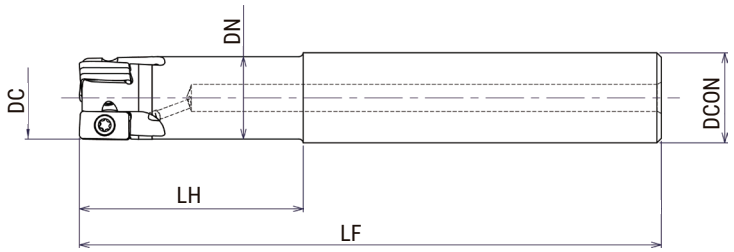
Screw	Torque(N.m)	Wrench
TSW-307H	2.1	A-10

Through coolant hole | Face Milling | Shoulder Milling | Slotting | Helical Interpolation | Plunge Milling

EXSAP-11 TYPE

Shank Type





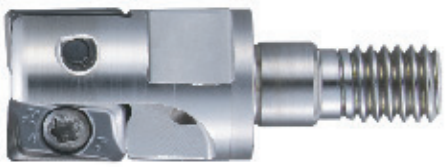
Cat.No.	Stock	No. of inserts	Dimensions (mm)					Insert
			DC	LH	LF	DN	DCON	
EXSAP-2016-11-30-S16	○	2	16	30	90	14.6	16	ZNGU1105**ZER-**
EXSAP-2016-11-50-S16	●	2	16	50	110	14.6	16	
EXSAP-3020-11-50-S20	●	3	20	50	130	18.3	20	
EXSAP-3020-11-80-S20	○	3	20	80	160	18.3	20	
EXSAP-3025-11-60-S25	●	3	25	60	140	23.4	25	
EXSAP-3025-11-100-S25	○	3	25	100	180	23.4	25	
EXSAP-3026-11-60-S25	○	3	26	60	140	23.4	25	
EXSAP-4030-11-70-S32	○	4	30	70	150	28.4	32	
EXSAP-4030-11-120-S32	○	4	30	120	200	28.4	32	
EXSAP-4032-11-70-S32	●	4	32	70	150	29	32	
EXSAP-4032-11-120-S32	○	4	32	120	200	29	32	
EXSAP-4033-11-70-S32	○	4	33	70	150	29	32	
EXSAP-5040-11-50-S32	○	5	40	50	150	37	32	
EXSAP-5040-11-50L-S32	○	5	40	50	200	37	32	

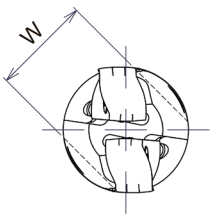
Screw	Torque(N.m)	Wrench
TSW-307H	2.1	A-10

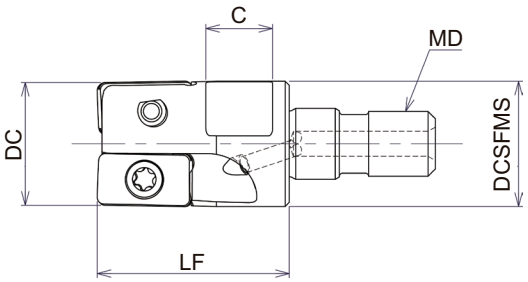
EXTREME SAP — EXSAP11/MSX11 Type

MSX-11 TYPE — **Modular Type**

Through coolant hole | Face Milling | Shoulder Milling | Slotting | Helical Interpolation | Plunge Milling







Cat.No.	Stock	No. of inserts	Dimensions (mm)						Insert
			DC	LF	DCSFMS	MD	C	W	
MSX-2016-11-M8	●	2	16	23	15	M8	8	12	ZNGU1105**ZER-**
MSX-2017-11-M8	○	2	17	23	15	M8	8	12	
MSX-2018-11-M8	○	2	18	23	15	M8	8	12	
MSX-3020-11-M10	●	3	20	30	18	M10	9	14	
MSX-3021-11-M10	○	3	21	30	18	M10	9	14	
MSX-3025-11-M12	●	3	25	35	22	M12	11	19	
MSX-3026-11-M12	○	3	26	35	22	M12	11	19	
MSX-3028-11-M12	○	3	28	35	22	M12	11	19	
MSX-4030-11-M16	○	4	30	43	29	M16	12	22	
MSX-4032-11-M16	●	4	32	43	29	M16	12	22	
MSX-4033-11-M16	○	4	33	43	29	M16	12	22	
MSX-4035-11-M16	○	4	35	43	29	M16	12	22	
MSX-5040-11-M16	●	5	40	43	29	M16	12	22	

Screw	Torque(N.m)	Wrench
TSW-307H	2.1	A-10

EXSAP11/MSX11 TYPE

Insert



Fig 1

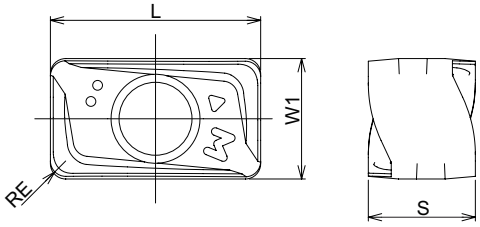
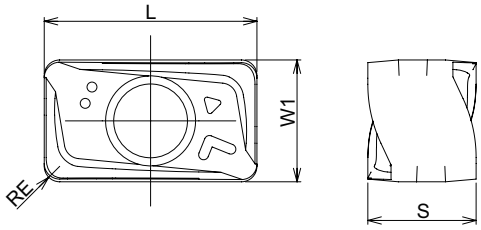


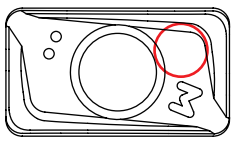


Fig 2

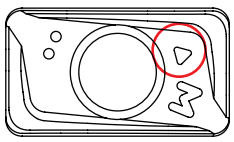


Cat.No.	Tolerance	PVD Coating						Dimensions (mm)				Fig.
		DS118	DS150	JC7518	JC7550	JC8050	JC8118	RE	L	W1	S	
ZNGU110504ZER-PM	G					●	●	0.4	11	6.3	5.6	1
ZNGU110508ZER-PM	G					●	●	0.8	11	6.3	5.6	1
ZNGU110512ZER-PM	G					○	○	1.2	11	6.3	5.6	1
ZNGU110516ZER-PM	G					●	●	1.6	11	6.3	5.6	1
ZNGU110504ZER-SL	G	●	●	●	●			0.4	11	6.3	5.6	2
ZNGU110508ZER-SL	G	●	●	●	●			0.8	11	6.3	5.6	2
ZNGU110516ZER-SL	G	●	●	●	●			1.6	11	6.3	5.6	2

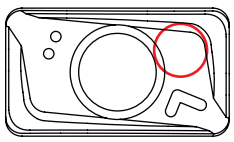
Grade markings



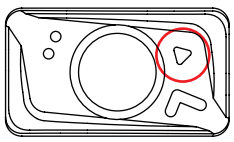
JC8118



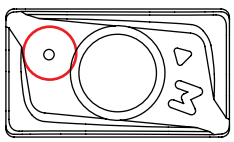
JC8050



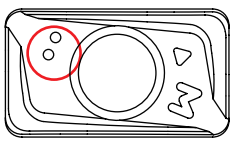
JC7518 / DS118



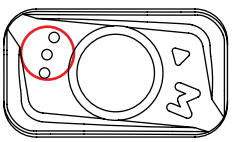
JC7550 / DS150



ZNGU110504ZER



ZNGU110508ZER



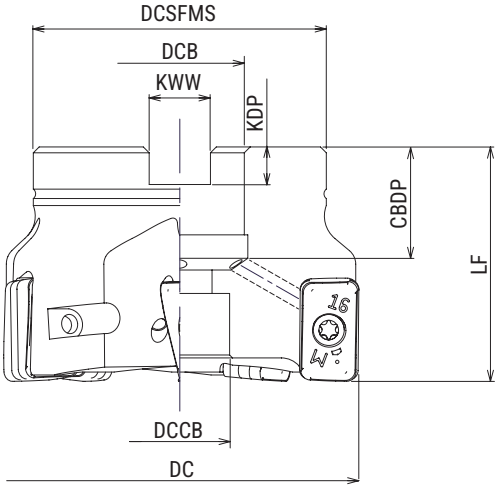
ZNGU110516ZER

EXTREME SAP — EXSAP17/MSX17 Type

EXSAP-17 TYPE — Bore Type

Through coolant hole | G - Body | Face Milling | Shoulder Milling | Slotting | Helical Interpolation | Plunge Milling





Cat.No.	Stock	No. of inserts	Dimensions (mm)								Arbor set bolt	Weight (kg)	Insert
			DC	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP			
EXSAP-4050R-22	●	4	50	40	47	22	17	10.4	6.3	20	M10	0.38	ZNGU1709**ZER-PM ZNGU170908ZER-SM
EXSAP-5050R-22	●	5	50	40	47	22	17	10.4	6.3	20	M10	0.38	
EXSAP-5052R-22	●	5	52	40	47	22	17	10.4	6.3	20	M10	0.41	
EXSAP-5063R-22	●	5	63	40	50	22	17	10.4	6.3	20	M10	0.58	
EXSAP-7080R-27	●	7	80	50	56	27	20	12.4	7	22	M12X1.75X30	1.09	
EXSAP-7100R-32	●	7	100	50	85	32	26	14.4	8	25	M16X2X25	1.93	
EXSAP-8125R-40	●	8	125	63	100	40	32	16.4	9	32	M20X2.5X40	3.66	

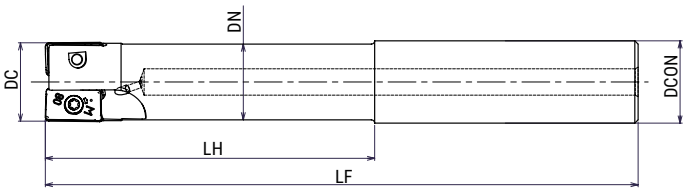
Screw	Torque(N.m)	Wrench
TSW-410H	3.5	A-15T

EXSAP-17 TYPE

Shank Type

Through coolant hole | Face Milling | Shoulder Milling | Slotting | Helical Interpolation | Plunge Milling





Cat.No.	Stock	No. of inserts	Dimensions (mm)					Insert
			DC	LH	LF	DN	DCON	
EXSAP-2025-60-S25	●	2	25	60	140	23	25	ZNGU1709**ZER-PM ZNGU170908ZER-SM
EXSAP-2025-100-S25	○	2	25	100	180	23	25	
EXSAP-2032-70-S32	○	2	32	70	150	29	32	
EXSAP-2032-120-S32	○	2	32	120	200	29	32	
EXSAP-3032-70-S32	●	3	32	70	150	29	32	
EXSAP-3032-120-S32	○	3	32	120	200	29	32	
EXSAP-3035-40-S32	○	3	35	40	150	32	32	
EXSAP-4040-40-S32	○	4	40	40	150	37	32	

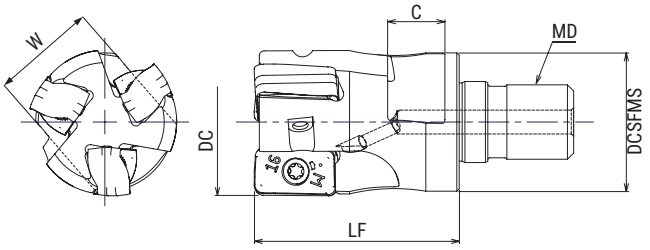
Screw	Torque(N.m)	Wrench
TSW-410H	3.5	A-15

EXTREME SAP — EXSAP17/MSX17 Type

MSX-17 TYPE — **Modular Type**

Through coolant hole | G - Body | Face Milling | Shoulder Milling | Slotting | Helical Interpolation | Plunge Milling





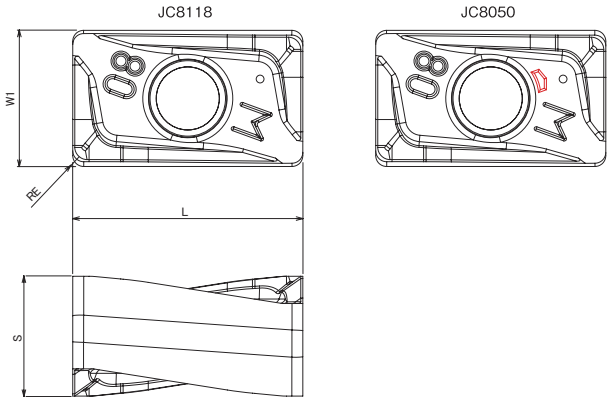
Cat.No.	Stock	No. of inserts	Dimensions (mm)						Insert
			DC	LF	DCSFMS	MD	C	W	
MSX-2025-M12	●	2	25	35	22	M12	11	19	ZNGU1709**ZER-PM ZNGU170908ZER-SM
MSX-2026-M12	○	2	26	35	22	M12	11	19	
MSX-2028-M12	○	2	28	35	22	M12	11	19	
MSX-2030-M16	○	2	30	43	29	M16	12	22	
MSX-2032-M16	●	2	32	43	29	M16	12	22	
MSX-3032-M16	●	3	32	43	29	M16	12	22	
MSX-3033-M16	○	3	33	43	29	M16	12	22	
MSX-3035-M16	○	3	35	43	29	M16	12	22	
MSX-4040-M16	●	4	40	43	29	M16	12	22	

Screw	Torque(N.m)	Wrench
TSW-410H	3.5	A-15

EXSAP17/MSX17 TYPE

Insert





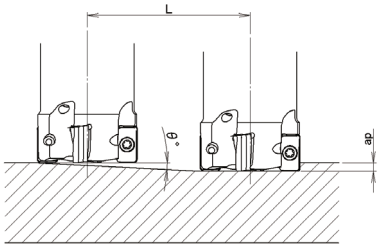
Cat.No.	Tolerance	PVD Coating		Dimensions (mm)			
		JC8050	JC8118	RE	L	W1	S
ZNGU170904ZER-PM	G	●	●	0.4	16.9	10	8.8
ZNGU170908ZER-PM	G	●	●	0.8	16.9	10	8.8
ZNGU170916ZER-PM	G	●	●	1.6	16.9	10	8.8
ZNGU170920ZER-PM	G	●	●	2	16.9	10	8.8
ZNGU170930ZER-PM	G	●	●	3	16.9	10	8.6

Cat.No.	Tolerance	PVD Coating	Dimensions (mm)			
		JC7550	RE	L	W1	S
ZNGU170908ZER-SM	G	●	0.8	16.9	10	8.8

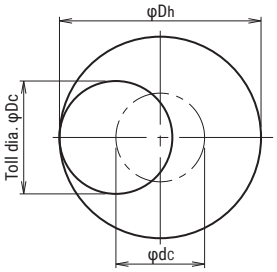
■ Recommended Data for Profile Milling

■ EXSAP-11 Type

Ramping



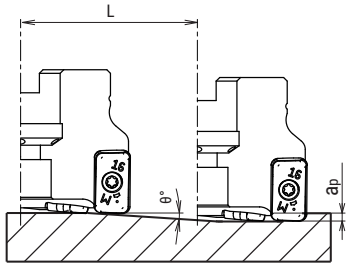
Helical interpolation



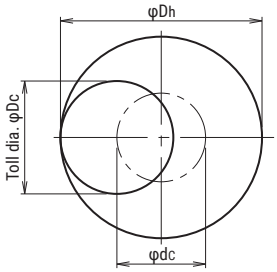
Cat.No.	Tool dia.	Effective Cutting dia.	Max. depth of cut : ap	Ramping		Helical interpolation	
				Max. ramping angle θ	Max.depth of cut : ap Total cutting length L(mm)	Min. Bore dia.	Max. Bore dia.
MSX-2016-11-M8	16	14.1	1.5	1.0°	86	18	29.6
MSX-3020-11-M10	20	18.1	1.5	0.7°	123	26	37.6
MSX-3025-11-M12	25	23.1	1.5	0.4°	215	36	47.6
MSX-4030-11-M16	30	28.1	1.5	0.3°	286	46	57.6
MSX-4032-11-M16	32	30.1	1.5	0.3°	286	50	61.6
MSX-5040-11-M16	40	38.1	1.5	0.2°	430	66	77.6
EXSAP-2016-11-**-S16	16	14.1	1.5	1.0°	86	18	29.6
EXSAP-3020-11-**-S20	20	18.1	1.5	0.7°	123	26	37.6
EXSAP-3025-11-**-S25	25	23.1	1.5	0.4°	215	36	47.6
EXSAP-4030-11-**-S32	30	28.1	1.5	0.3°	286	46	57.6
EXSAP-4032-11-**-S32	32	30.1	1.5	0.3°	286	50	61.6
EXSAP-5040-11-**-S32	40	38.1	1.5	0.2°	430	66	77.6
EXSAP-6040R-11-16	40	38.1	1.5	0.2°	430	66	77.6
EXSAP-7050R-11-22	50	48.1	1.5	0.15°	573	86	97.6
EXSAP-7052R-11-22	52	50.1	1.5	0.15°	573	90	101.6
EXSAP-7063R-11-22	63	61.1	1.5	Not recommended			
EXSAP-7063R-11-27	63	61.1	1.5				
EXSAP-8080R-11-27	80	78.1	1.5				

■ EXSAP-17 Type

Ramping



Helical interpolation



Cat.No.	Tool dia.	Effective Cutting dia.	Max. depth of cut : ap	Ramping		Helical interpolation	
				Max. ramping angle θ	Max.depth of cut : ap Total cutting length L(mm)	Min. Bore dia.	Max. Bore dia.
EXSAP/MSX-2025	25	21.5	1.5	0.7°	123	34	46
MSX-2026-M12	26	22.5	1.5	0.7°	123	36	48
MSX-2028-M12	28	25.5	1.5	0.6°	143	40	52
MSX-2030-M16	30	26.5	1.5	0.6°	143	44	56
EXSAP/MSX-*032	32	28.5	1.5	0.5°	172	48	60
MSX-3033-M16	33	29.5	1.5	0.5°	172	50	62
MSX-3035-M16	35	31.5	1.5	0.4°	215	54	66
MSX-4040-M16	40	36.5	1.5	0.4°	215	64	76
EXSAP-*050R-22	50	46.5	1.5	0.3°	286	84	96
EXSAP-5052R-22	52	48.5	1.5	0.3°	286	88	100
EXSAP-5063R-22	63	59.5	1.5	0.2°	430	110	122
EXSAP-7080R-27	80	76.5	1.5	0.15°	573	144	156
EXSAP-7100R-32	100	96.5	Not recommended				
EXSAP-8125R-40	125	121.5					

- In case of ramping and helical interpolation, apply 80% or less feed (Vf) from standard cutting condition table
- In case of helical interpolation, recommend wet cutting by coolant through the tool

- Calculation of tool pass dia.

$$\varphi dc = \varphi Dh - \varphi Dc$$

Tool pass dia. Bore dia. Tool Dia.

- Depth of cut per one circuit should not exceed max. depth of cut Ap
- Down cutting is recommended, tool pass rotation should be counterclockwise

■Recommended Cutting Conditions

●EXSAP-11 type / Side Milling

Material	Grade	Vc	fz		Tool dia. (mm)							
					16	20	25	32	40	50	63	80
Carbon Steel below 250HB	JC8050 (JC8118)	140 - 180	0.14 - 0.20	ap	~5	~5	~6	~6	~7	~8	~9	~9
				ap x ae	~4	~5	~7.2	~9.8	~14	~24	~30	~36
Cast Steel below 285HB	JC8050 (JC8118)	140 - 180	0.14 - 0.20	ap	~5	~5	~6	~6	~7	~8	~9	~9
				ap x ae	~4	~5	~7.2	~9.8	~14	~24	~30	~36
Tool & Die Steel below 255HB	JC8050 (JC8118)	140 - 180	0.14 - 0.20	ap	~5	~5	~6	~6	~7	~8	~9	~9
				ap x ae	~4	~5	~7.2	~9.8	~14	~24	~30	~36
Mold Steel 30-36HRC	JC8118 (JC8050)	110 - 130	0.10 - 0.18	ap	~5	~5	~6	~6	~7	~8	~9	~9
				ap x ae	~4	~5	~7.2	~9.8	~14	~24	~30	~36
Mold Steel 38-43HRC	JC8118 (JC8050)	90 - 120	0.10 - 0.18	ap	~5	~5	~6	~6	~7	~8	~9	~9
				ap x ae	~3.4	~4	~6	~8	~10	~20	~24	~28
Hardened Die Steel 42-52HRC	JC8118	80 - 100	0.07 - 0.12	ap	~3	~3.5	~4	~4	~4.5	~6	~9	~9
				ap x ae	~1.6	~2	~3.2	~3.6	~4	~8	~9	~10
Grey Cast Iron below 160-260HB	JC8118 (JC8050)	160 - 200	0.14 - 0.20	ap	~5	~5	~6	~6	~7	~8	~9	~9
				ap x ae	~5	~6	~9.8	~12	~16	~28	~34	~40
Nodular Cast Iron below 170-300HB	JC8118 (JC8050)	140 - 180	0.12 - 0.20	ap	~5	~5	~6	~6	~7	~8	~9	~9
				ap x ae	~5	~6	~9.8	~12	~16	~28	~34	~40
Austenitic Stainless Steel	JC8050 (JC7550)	100 - 120	0.10 - 0.18	ap	~5	~5	~6	~6	~7	~8	~9	~9
				ap x ae	~4	~5	~7.2	~9.8	~14	~24	~30	~36
Martensitic Stainless Steel	JC8050 (JC7550)	100 - 140	0.10 - 0.18	ap	~5	~5	~6	~6	~7	~8	~9	~9
				ap x ae	~3.2	~5	~7.2	~9.8	~14	~24	~30	~36
Titanium Alloy	DS150 (JC7550)	50 - 70	0.11 - 0.13	ap	~5	~5	~6	~6	~7	~8	~9	~9
				ap x ae	~3.2	~4	~6	~8	~10	~20	~26	~30
Heat Resistant Alloy	JC7518 (JC8118)	20 - 30	0.08 - 0.10	ap	~5	~5	~6	~6	~7	~8	~9	~9
				ap x ae	~3.2	~4	~6	~8	~10	~20	~26	~30

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use air blow.

■Recommended Cutting Conditions

●EXSAP-11 type / Face Milling

Material	Grade	Vc	fz		Tool dia. (mm)							
					16	20	25	32	40	50	63	80
Carbon Steel below 250HB	JC8050 (JC8118)	130 - 180	0.11 - 0.2	ap	~1	~1.2	~1.2	~1.5	~1.8	~2	~2	~2
				ae	~10	~12	~15	~18	~24	~30	~30	~48
Cast Steel below 285HB	JC8050 (JC8118)	130 - 180	0.11 - 0.2	ap	~1	~1.2	~1.2	~1.5	~1.8	~2	~2	~2
				ae	~10	~12	~15	~18	~24	~30	~30	~48
Tool & Die Steel below 255HB	JC8050 (JC8118)	130 - 180	0.11 - 0.2	ap	~1	~1.2	~1.2	~1.5	~1.8	~2	~2	~2
				ae	~10	~12	~15	~18	~24	~30	~30	~48
Mold Steel 30-36HRC	JC8118 (JC8050)	110 - 130	0.1 - 0.18	ap	~1	~1.2	~1.2	~1.5	~1.8	~2	~2	~2
				ae	~10	~12	~15	~18	~24	~30	~30	~48
Mold Steel 38-43HRC	JC8118 (JC8050)	90 - 120	0.1 - 0.16	ap	~0.8	~1	~1	~1.2	~1.4	~1.8	~1.8	~1.8
				ae	~10	~12	~15	~18	~24	~30	~30	~48
Hardened Die Steel 42-52HRC	JC8118	80 - 100	0.08 - 0.12	ap	~0.4	~0.5	~0.5	~0.6	~0.8	~1	~1	~1
				ae	~8	~8	~10	~12	~16	~20	~25	~32
Grey Cast Iron below 160-260HB	JC8118 (JC8050)	160 - 200	0.11 - 0.2	ap	~1	~1.2	~1.2	~1.5	~1.8	~2	~2	~2
				ae	~10	~12	~15	~18	~24	~30	~30	~48
Nodular Cast Iron below 170-300HB	JC8118 (JC8050)	130 - 180	0.11 - 0.2	ap	~1	~1.2	~1.2	~1.5	~1.8	~2	~2	~2
				ae	~10	~12	~15	~18	~24	~30	~30	~48
Austenitic Stainless Steel	JC8050 (JC7550)	100 - 120	0.11 - 0.18	ap	~1	~1.2	~1.2	~1.5	~1.8	~2	~2	~2
				ae	~6	~8	~10	~12	~16	~20	~25	~32
Martensitic Stainless Steel	JC8050 (JC7550)	100 - 150	0.11 - 0.18	ap	~1	~1.2	~1.2	~1.5	~1.8	~2	~2	~2
				ae	~10	~12	~15	~18	~24	~30	~30	~48
Titanium Alloy	DS150 (JC7550)	50 - 70	0.08 - 0.12	ap	~0.8	~1	~1	~0.8	~1.4	~1.8	~1.8	~1.8
				ae	~6	~8	~10	~12	~16	~20	~25	~32
Heat Resistant Alloy	JC7518 (JC8118)	20 - 30	0.06 - 0.11	ap	~0.8	~1	~1	~0.8	~1.4	~1.8	~1.8	~1.8
				ae	~6	~8	~10	~12	~16	~20	~25	~32

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use air blow.
5. When using for slot milling, apply 50% or less feed (Vf) from standard cutting condition.

■Recommended Cutting Conditions

●EXSAP-17 type / Side Milling

Material	Grade	Vc	fz		Tool dia. (mm)							
					25	32	40	50	63	80	100	125
Carbon Steel below 250HB	JC8050	150 - 200	0.2 - 0.35	ap	~10	~12	~15	~15	~15	~15	~15	~15
				ap x ae	~15	~24	~30	~40	~45	~45	~45	~45
Cast Steel below 285HB	JC8050	130 - 180	0.2 - 0.35	ap	~10	~12	~15	~15	~15	~15	~15	~15
				ap x ae	~15	~24	~30	~40	~45	~45	~45	~45
Tool & Die Steel below 255HB	JC8050	150 - 200	0.2 - 0.35	ap	~10	~12	~15	~15	~15	~15	~15	~15
				ap x ae	~15	~24	~30	~40	~45	~45	~45	~45
Mold Steel 30-36HRC	JC8118	110 - 150	0.2 - 0.35	ap	~10	~12	~15	~15	~15	~15	~15	~15
				ap x ae	~15	~24	~30	~40	~45	~45	~45	~45
Mold Steel 38-43HRC	JC8118	90 - 120	0.15 - 0.25	ap	~10	~12	~15	~15	~15	~15	~15	~15
				ap x ae	~12	~18	~20	~30	~30	~30	~30	~30
Hardened Die Steel 42-52HRC	JC8118	80 - 100	0.1 - 0.2	ap	~10	~12	~12	~15	~15	~15	~15	~15
				ap x ae	~7	~8	~12	~18	~25	~25	~25	~25
Grey Cast Iron below 160-260HB	JC8118	200 - 250	0.2 - 0.35	ap	~10	~12	~15	~15	~15	~15	~15	~15
				ap x ae	~15	~24	~30	~40	~45	~45	~45	~45
Nodular Cast Iron below 170-300HB	JC8118	110 - 150	0.15 - 0.3	ap	~10	~12	~15	~15	~15	~15	~15	~15
				ap x ae	~15	~24	~30	~40	~45	~45	~45	~45
Austenitic Stainless Steel	JC8050 (JC7550)	100 - 120	0.1 - 0.2	ap	~10	~12	~15	~15	~15	~15	~15	~15
				ap x ae	~15	~24	~30	~40	~45	~45	~45	~45
Martensitic Stainless Steel	JC8118	130 - 180	0.15 - 0.3	ap	~10	~12	~15	~15	~15	~15	~15	~15
				ap x ae	~15	~24	~30	~40	~45	~45	~45	~45

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use air blow.

■Recommended Cutting Conditions

●EXSAP-17 type / Face Milling

Material	Grade	Vc	fz		Tool dia. (mm)							
					25	32	40	50	63	80	100	125
Carbon Steel below 250HB	JC8050	110 - 150	0.20 - 0.30	ap	~3	~3.5	~3.5	~4	~4	~4	~4	~4
				ae	~25	~32	~40	~50	~63	~80	~100	~125
Cast Steel below 285HB	JC8050	110 - 150	0.20 - 0.30	ap	~3	~3.5	~3.5	~4	~4	~4	~4	~4
				ae	~25	~32	~40	~50	~63	~80	~100	~125
Tool & Die Steel below 255HB	JC8050	110 - 150	0.15 - 0.25	ap	~3	~3.5	~3.5	~4	~4	~4	~4	~4
				ae	~25	~32	~40	~50	~63	~80	~100	~125
Mold Steel 30-36HRC	JC8118	110 - 130	0.15 - 0.25	ap	~3	~3.5	~3.5	~4	~4	~4	~4	~4
				ae	~25	~32	~40	~50	~63	~80	~100	~125
Mold Steel 38-43HRC	JC8118	90 - 110	0.15 - 0.25	ap	~2	~2.5	~2.5	~3	~3	~3	~4	~4
				ae	~25	~32	~40	~50	~63	~80	~100	~125
Hardened Die Steel 42-52HRC	JC8118	70 - 90	0.10 - 0.20	ap	~1	~2	~2	~2.5	~2.5	~2.5	~4	~4
				ae	~20	~25	~32	~40	~55	~65	~80	~100
Grey Cast Iron below 160-260HB	JC8118	130 - 180	0.20 - 0.30	ap	~5	~5.5	~5.5	~6	~6	~6	~4	~4
				ae	~25	~32	~40	~50	~63	~80	~100	~125
Nodular Cast Iron below 170-300HB	JC8118	110 - 130	0.15 - 0.25	ap	~3	~3.5	~3.5	~4	~4	~4	~4	~4
				ae	~25	~32	~40	~50	~63	~80	~100	~125
Austenitic Stainless Steel	JC8050 (JC7550)	90 - 110	0.10 - 0.20	ap	~3	~3.5	~3.5	~4	~4	~4	~4	~4
				ae	~20	~25	~32	~40	~55	~65	~80	~100
Martensitic Stainless Steel	JC8118	110 - 150	0.15 - 0.25	ap	~3	~3.5	~3.5	~4	~4	~4	~4	~4
				ae	~25	~32	~40	~50	~63	~80	~100	~125

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use air blow.
5. When using for slot milling, apply 50% or less feed (Vf) from standard cutting condition.

Double sided insert with 6 cutting edge

SHOULDER SIX

Unique 3D insert

Due to arc-geometry on the peripheral cutting edge, cusp height can be smaller even in case of large ap.



Achieves low cutting force

Achieves high efficient & high precision machining for side walls.

Features

This tool can accommodate an array of applications such as face milling, slotting and plunging. The unique 3D design of the insert has 6 positive axial cutting edges which decrease tool pressure.

Double - sided insert with 6 cutting edges.
The robust insert is 7.5mm in thickness allowing for stable machining and longer tool life.



ISO	P					M					K				H		
	P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30	H01	H10	H20
Range		JC8118					JC8118					JC8118				JC8118	
				JC8050					JC8050								



EXSIX TYPE Bore Type



Fig.1
Through coolant hole

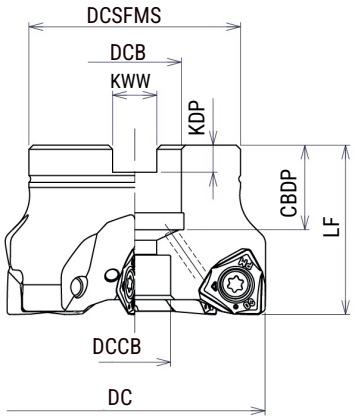
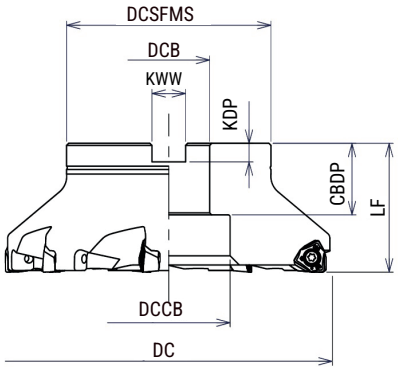


Fig.2
Without coolant hole



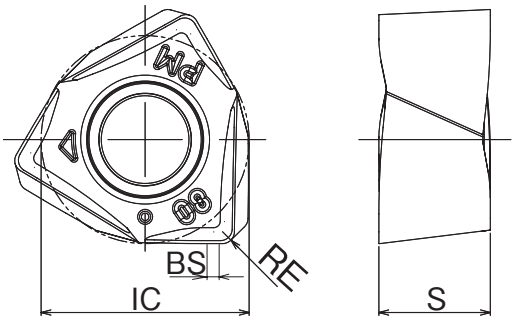
Cat.No.	Stock	No. of inserts	Dimensions (mm)								Arbor set bolt	Weight (kg)	Insert	Fig.
			DC	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP				
EXSIX-4050R-22	●	4	50	40	47	22	14	10.4	6.3	20	M10X1.5X25★	0.33	YCMU0907**ZER-PM	1
EXSIX-4052R-22	●		52								M10X1.5X25★	0.35		
EXSIX-5063R-22	●	5	63		50		17				M10	0.50		
EXSIX-5066R-22	●		66								M10	0.53		
EXSIX-6080R-27	●	6	80	50	56	27	20	12.4	7	22	M12X1.75X30★	0.93		
EXSIX-7100R-32	●	7	100		85	32	26	14.4	8	25	M16X2X30★	1.88		
EXSIX-8125R-40	●	8	125	63	100	40	32	16.4	9	32	M20X2.5X40★	3.62		
EXSIX-9160R-40	●	9	160				60			35	M20	4.67		2

Screw	Torque(N.m)	Wrench
CSW-513H	5.5	A-20

SHOULDER SIX — EXSIX Type

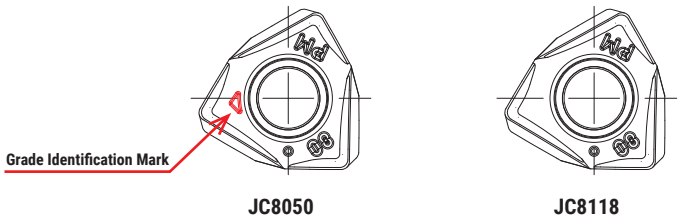
Insert





Cat.No.	Tolerance	PVD Coating		Dimensions (mm)			
		JC8050	JC8118	RE	BS	IC	S
YCMU090708ZER-PM	M	●	●	0.8	1.41	14	7.5
YCMU090716ZER-PM		●	●	1.6	0.62		

GRADE MARKING



■Recommended Cutting Conditions

Material	Grade	Shoulder Milling				Face Milling				Plunge Milling			
		Vc	fz	ap	ap x ae	Vc	fz	ap	ae	Vc	fz	ae	Pf
Carbon Steel below250HB	JC8050	160 - 200	0.20 - 0.35	~9.0	~45	110 - 150	0.20 - 0.30	~4.0	~1.0Dc	180	0.25	~5	~0.5Dc
Cast Steel below 285HB	JC8050	140 - 180	0.20 - 0.35	~9.0	~45	110 - 150	0.20 - 0.30	~4.0	~1.0Dc	160	0.25	~5	~0.5Dc
Tool & Die Steel below 255HB	JC8050	160 - 200	0.20 - 0.35	~9.0	~45	110 - 150	0.15 - 0.25	~4.0	~1.0Dc	180	0.20	~5	~0.5Dc
Mold Steel 30-36HRC	JC8118	120 - 150	0.20 - 0.35	~9.0	~45	110 - 130	0.15 - 0.25	~4.0	~1.0Dc	130	0.20	~5	~0.5Dc
Mold Steel 38-43HRC	JC8118	90 - 120	0.15 - 0.25	~9.0	~30	90 - 110	0.10 - 0.25	~3.0	~1.0Dc	100	0.20	~5	~0.5Dc
Hardened Die Steel 42-52HRC	JC8118	80 - 100	0.10 - 0.20	~9.0	~25	70 - 90	0.10 - 0.20	~2.5	~0.8Dc	90	0.10	~5	~0.5Dc
Grey Cast Iron below 160-260HB	JC8118	210 - 250	0.20 - 0.35	~9.0	~45	130 - 180	0.20 - 0.30	~6.0	~1.0Dc	200	0.30	~5	~0.5Dc
Nodular Cast Iron below 170-300HB	JC8118	110 - 150	0.15 - 0.30	~9.0	~45	110 - 130	0.15 - 0.25	~4.0	~1.0Dc	130	0.20	~5	~0.5Dc
Austenitic Stainless Steel	JC8050	100 - 120	0.10 - 0.20	~9.0	~45	90 - 110	0.10 - 0.20	~4.0	~0.8Dc	110	0.15	~5	~0.5Dc
Martensitic Stainless Steel	JC8118	140 - 180	0.15 - 0.30	~9.0	~45	110 - 150	0.15 - 0.25	~4.0	~1.0Dc	160	0.20	~5	~0.5Dc

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use air blow.
5. When using for slot milling, apply 50% or less feed (Vf) from standard cutting condition.
6. Ramping and helical interpolation are not recommended.

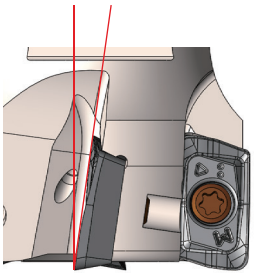
Feature 1 Arc Geometry on Peripheral Cutting Edge

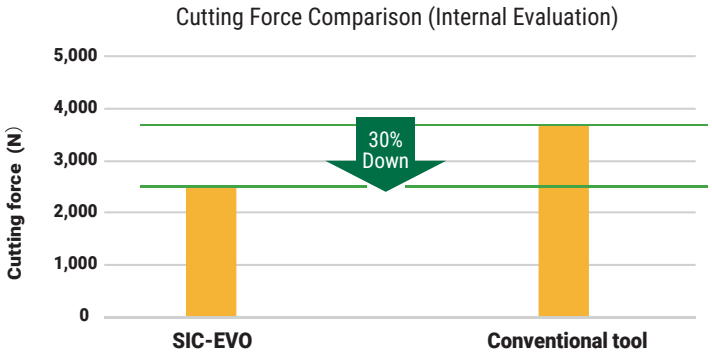


The arc-shaped peripheral cutting edge
minimizes cusp height even at large depth of cut (ap),
enabling high-efficiency, high-precision machining of vertical walls.

Max. depth of cut (ap) =15mm is possible.

Feature 2 Low Cutting Force with High-Positive Geometry





Work Material : 1.1213
Tool dia : ø25
Cutting Conditions : Vc=200m/min, fz=0.1mm/t, ap=15mm, ae=1mm

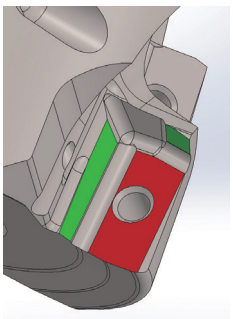


Optimized Cutting Edge Geometry

Feature 3 Multi-functional indexable cutter

Usable for a wide range of applications such as face milling, slotting, pocket milling & side milling.





Three-face insert clamping ensures stable ramping and helical interpolation.

Feature 4 Long Cutting Edge Cutter Body

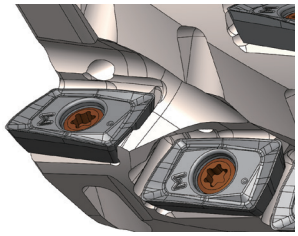
New long-edge cutter body lineup enables deeper shoulder milling in both bore and shank type holders.





Long Cutting Edge Cutter Lineup

- Bore type
  - ø50 mm → Max. Depth of Cut(ap) : 57mm
  - ø63 mm → Max. Depth of Cut(ap) : 57mm
  - ø80 mm → Max. Depth of Cut(ap) : 71mm
- Shank type
  - ø32 mm → Max. Depth of Cut(ap) : 43mm
  - ø40 mm → Max. Depth of Cut(ap) : 57mm



- **Wide pocket geometry** enhances chip evacuation.
- **Coolant holes in every pocket** improve chip evacuation and prevent chip welding.

Feature 5 Insert Line-up



- For Steel

ZOMT1605...ZER-PM
(R0.4, R0.8, R1.6, R2.0, R3.0, R4.0, R5.0)

P M K H



- For Aluminium alloy
- High precision periphery ground insert.

ZOET1605...ZFR-NL
(R0.4, R0.8, R1.6, R2.0, R3.0, R3.2)

N

■ Application

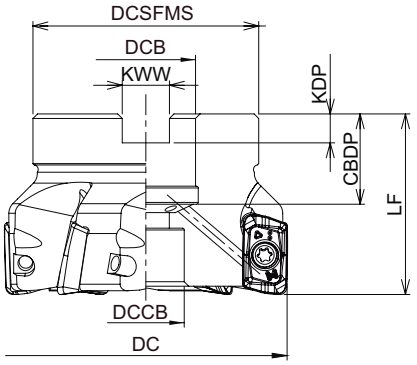
ISO	P					M					K				H			N			
	P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30	H01	H10	H20	N01	N10	N20	N30
Range		JC8118						JC8118				JC8118				JC8118					
				JC8050						JC8050										FC18	

SIC-EVO — SSV / SSVL Type

Through coolant hole | Face Milling | Shoulder Milling | Slotting | Copy Milling | Pocket Milling | Helical Interpolation

SSV TYPE — Bore Type





Cat.No.	Stock	No. of inserts	Dimensions (mm)								Max. spindle speed (min^{-1})	Arbor set bolt	Weight (kg)	Insert
			DC	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP				
SSV-4040R-16	●	4	40	40	35	16	14	8.4	5.6	18	19,000	M8	0.20	ZOMT1605**ZER-PM ZOET1605**ZFR-NL
SSV-5050R-22	●	5	50	40	47	22	17	10.4	6.3	20	16,000	M10	0.33	
SSV-6063R-22	●	6	63	40	50	22	17	10.4	6.3	20	14,000	M10	0.52	
SSV-6063R-27	●	6	63	50	60	27	20	12.4	7	22	14,000	M12X1.75X30 ★	0.75	
SSV-7080R-27	●	7	80	50	60	27	20	12.4	7	22	12,000	M12X1.75X30 ★	1.08	
SSV-8100R-32	●	8	100	50	85	32	26	14.4	8	25	11,000	M16X2X30 ★	1.95	
SSV-8125R-40	●	8	125	63	100	40	32	16.4	9	32	9,600	M20X2.5X40 ★	3.73	

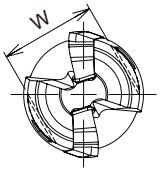
Note) When using inserts with corner radius RE4 or RE5, please machine the cutter body to R4 or C4.5.

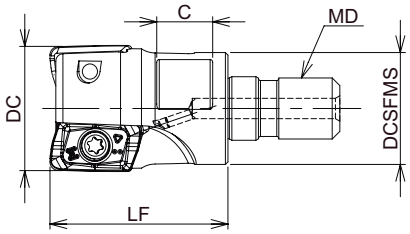
Screw	Torque(N.m)	Wrench
DSW-4075H	3.6	A-15T

Through coolant hole

SSV TYPE — Modular Type







Cat.No.	Stock	No. of inserts	Dimensions (mm)						Max. spindle speed (min^{-1})	Insert
			DC	LF	DCSFMS	MD	C	W		
SSV-2025-M12	●	2	25	35	22	M12	11	19	26,000	ZOMT1605**ZER-PM ZOET1605**ZFR-NL
SSV-2028-M12	○	2	28	35	22	M12	11	19	24,000	
SSV-3030-M16	○	3	30	43	29	M16	12	22	23,000	
SSV-3032-M16	●	3	32	43	29	M16	12	22	22,000	
SSV-3035-M16	●	3	35	43	29	M16	12	22	20,000	
SSV-4040-M16	●	4	40	43	29	M16	12	22	19,000	

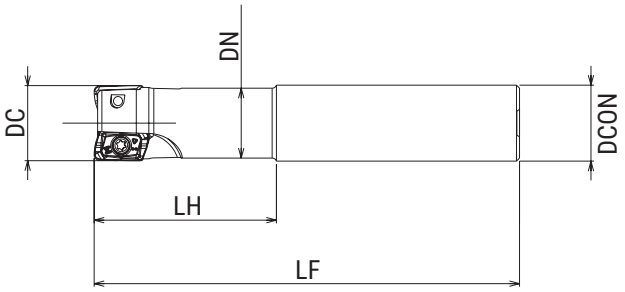
Note) When using inserts with corner radius RE4 or RE5, please machine the cutter body to R4 or C4.5.

Screw	Torque(N.m)	Wrench
DSW-4075H	3.6	A-15



SSV TYPE Shank Type



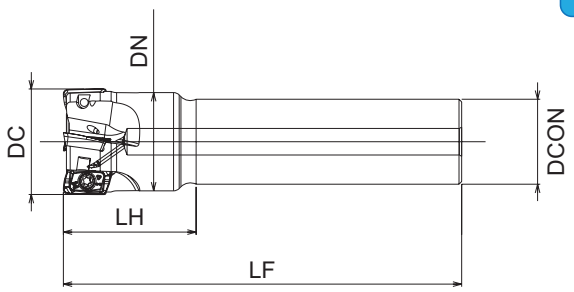


Cat.No.	Stock	No. of inserts	Dimensions (mm)					Insert
			DC	LH	LF	DN	DCON	
SSV-2025-60-S25+A	●	2	25	60	140	23	25	ZOMT1605**ZER-PM ZOET1605**ZFR-NL
SSV-2025-100-S25+A	●	2	25	100	180	23	25	
SSV-3032-70-S32+A	●	3	32	70	150	29	32	
SSV-3032-120-S32+A	●	3	32	120	200	29	32	
SSV-4040-50L-S32+A	●	4	40	50	200	37	32	

Note) When using inserts with corner radius RE4 or RE5, please machine the cutter body to R4 or C4.5.

Through coolant hole





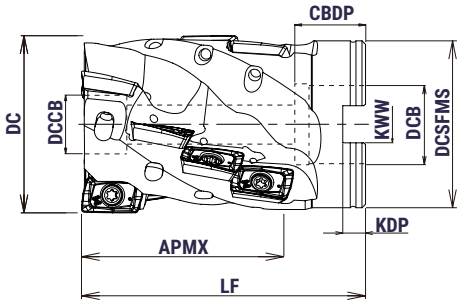
Cat.No.	Stock	No. of inserts	Dimensions (mm)					Insert
			DC	LH	LF	DN	DCON	
SSV-4040-50-S32	●	4	40	50	150	37	32	ZOMT1605**ZER-PM ZOET1605**ZFR-NL

Note) When using inserts with corner radius RE4 or RE5, please machine the cutter body to R4 or C4.5.

Screw	Torque(N.m)	Wrench
DSW-4075H	3.6	A-15

SSVL TYPE Bore Type LONG CUTTING EDGE





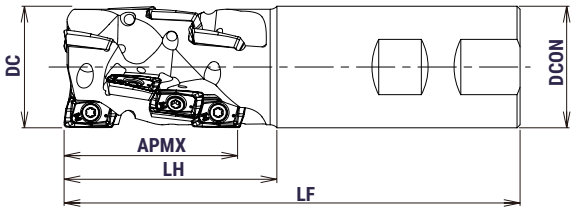
Cat.No.	Stock	No. of Flutes	No. of inserts	Dimensions (mm)									Arbor set bolt	Weight (kg)	Insert
				DC	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP	APMX			
SSVL-3050R-57-22	●	3	12	50	80	47	22	16.5	10.4	6.3	20	57	ASB-M10065	0.75	ZOMT1605**ZER-PM
SSVL-4063R-57-27	●	4	16	63	80	60	27	20	12.4	7	22	57	ASB-M12065	1.27	
SSVL-5080R-71-32	●	5	25	80	95	70	32	26	14.4	8	25	71	ASB-M16070	2.47	

Note) 1.When using inserts with corner radius RE4 or RE5, please machine the cutter body to R4 or C4.5.
2.Corner radius RE0.8 is recommended for peripheral cutting edges, excluding the bottom cutting edge.
Inserts with corner radius RE0.4 can also be used.

Screw	Torque(N.m)	Wrench
DSW-4075H	3.6	A-15T

SSVL TYPE Shank Type LONG CUTTING EDGE





Cat.No.	Stock	No. of Flutes	No. of inserts	Dimensions (mm)					Insert
				DC	LF	DCON	LH	APMX	
SSVL-2032-43-S32	●	2	6	32	140	32	60	43	ZOMT1605**ZER-PM
SSVL-3040-57-S40	●	3	12	40	150	40	70	57	

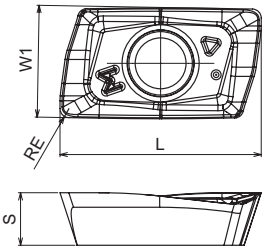
Note) 1.When using inserts with corner radius RE4 or RE5, please machine the cutter body to R4 or C4.5.
2.Corner radius RE0.8 is recommended for peripheral cutting edges, excluding the bottom cutting edge.
Inserts with corner radius RE0.4 can also be used.

Screw	Torque(N.m)	Wrench
DSW-4075H	3.6	A-15T

Insert

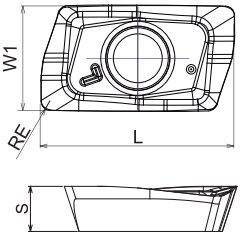
For Steel





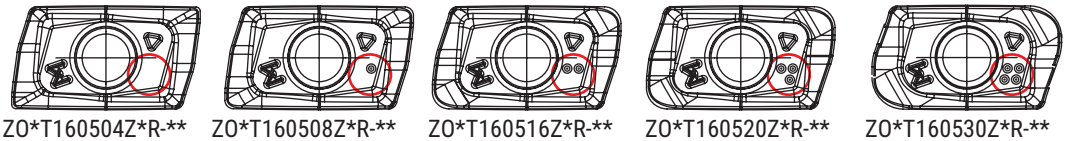
For Aluminium alloy



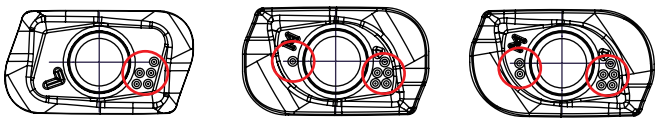


Cat.No.	Tolerance	PVD Coating		Uncoated	Dimensions (mm)			
		JC8050	JC8118	FC18	RE	L	W1	S
ZOMT160504ZER-PM	M	●	●		0.4	18	10	4.7
ZOMT160508ZER-PM	M	●	●		0.8	18	10	4.7
ZOMT160516ZER-PM	M	●	●		1.6	18	10	4.7
ZOMT160520ZER-PM	M	●	●		2.0	18	10	4.7
ZOMT160530ZER-PM	M	●	●		3.0	18	10	4.7
ZOMT160540ZER-PM	M	●	●		4.0	17	10	4.7
ZOMT160550ZER-PM	M	●	●		5.0	17	9.9	4.7
ZOET160504ZFR-NL	E			●	0.4	18	10	4.7
ZOET160508ZFR-NL	E			●	0.8	18	10	4.7
ZOET160516ZFR-NL	E			●	1.6	18	10	4.7
ZOET160520ZFR-NL	E			●	2.0	18	10	4.7
ZOET160530ZFR-NL	E			●	3.0	18	10	4.7
ZOET160532ZFR-NL	E			○	3.2	18	10	4.7

GRADE MARKINGS

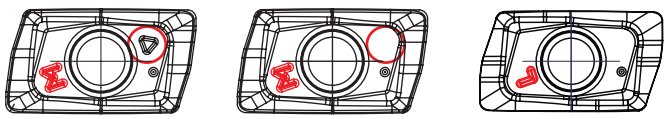


ZO*T160504Z*R-** ZO*T160508Z*R-** ZO*T160516Z*R-** ZO*T160520Z*R-** ZO*T160530Z*R-**



ZOET160532ZFR-NL ZOMT160540ZER-PM ZOMT160550ZER-PM

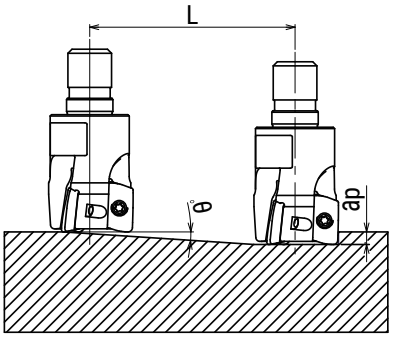
JC8050 JC8118 FC18



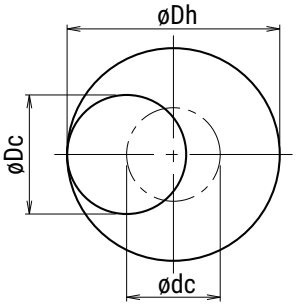
SSV TYPE

■ Recommended Data for Profile Milling

Ramping



Helical interpolation



- Calculation of tool pass dia.

$$ødc = øDh - øDc$$

Tool pass dia. Bore dia. Tool Dia.

- Depth of cut per one circuit should not exceed max. depth of cut ap.
- Down cutting is recommended, tool pass rotation should be counterclockwise.

- In case of ramping and helical interpolation, apply 80% or less feed (Vf) from standard cutting condition table.
- In case of drilling , apply 50% or less feed (Vf) from standard cutting condition table.
- In case of helical interpolation, recommend wet cutting by coolant through the tool.
- Long chips may come out in case of drilling, confirm safe operating conditions.

Tool dia. (mm)	Effective Cutting dia. (mm)	Ramping					Helical Interpolation		Max. Drilling Depth: Z (mm)
		Max. ramping angle θ	Max Depth of Cut : ap (mm)		Total Cutting Length at Max ap : L(mm)		Min. Bore dia. Dh min (mm)	Max. Bore dia. Dh max (mm)	
			STEELS	ALUMINIUM	STEELS	ALUMINIUM			
25	24.7−2×R	6.2	1.5	7	13.8	64.5	31	49.2−2×R	1.4
28	27.7−2×R	5.3	1.5	7	16.2	75.5	37	55.2−2×R	1.4
30	29.7−2×R	4.8	1.5	7	17.9	83.4	41	59.2−2×R	1.4
32	31.7−2×R	4.4	1.5	7	19.5	91.0	45	63.2−2×R	1.4
35	34.7−2×R	4.3	1.5	7	19.9	93.1	51	69.2−2×R	1.4
40	39.7−2×R	3.6	1.5	7	23.8	111.3	61	79.2−2×R	1.4
50	49.7−2×R	2.4	1.5	7	35.8	167.1	81	99.2−2×R	1.4
63	62.7−2×R	1.7	1.5	7	50.5	235.9	107	125.2−2×R	1.4
80	79.7−2×R	1.2	1.5	7	71.6	334.2	141	159.2−2×R	1.4
100	99.7−2×R	0.9	1.5	7	95.5	445.6	181	199.2−2×R	1.4
125	124.7−2×R	0.65	1.5	7	132.2	617.0	231	249.2−2×R	1.4

■Recommended Cutting Conditions | Shoulder Milling | SSV type

Material	Grade	*Vc* (m/min)	*fz* (mm/t)		Tool dia. (mm)							
					25	32	40	50	63	80	100	125
Carbon Steel below 250HB	JC8050	200 (160–200)	0.35 (0.20–0.35)	ap	≤ 10.0	≤ 12.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0
				ap x ae	≤ 15	≤ 24	≤ 30	≤ 40	≤ 45	≤ 45	≤ 45	≤ 45
Cast Steel below 285HB	JC8050	180 (140–180)	0.3 (0.20–0.30)	ap	≤ 10.0	≤ 12.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0
				ap x ae	≤ 15	≤ 24	≤ 30	≤ 40	≤ 45	≤ 45	≤ 45	≤ 45
Tool & Die Steel below 255HB	JC8050	200 (160–200)	0.35 (0.20–0.35)	ap	≤ 10.0	≤ 12.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0
				ap x ae	≤ 15	≤ 24	≤ 30	≤ 40	≤ 45	≤ 45	≤ 45	≤ 45
Mold Steel 30-36HRC	JC8118	150 (120–150)	0.35 (0.20 -0.35)	ap	≤ 10.0	≤ 12.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0
				ap x ae	≤ 15	≤ 24	≤ 30	≤ 40	≤ 45	≤ 45	≤ 45	≤ 45
Mold Steel 38-43HRC	JC8118	120 (90–120)	0.25 (0.15–0.25)	ap	≤ 10.0	≤ 12.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0
				ap x ae	≤ 12	≤ 18	≤ 20	≤ 30	≤ 30	≤ 45	≤ 45	≤ 45
Hardened Die Steel 42-52HRC	JC8118	100 (80–100)	0.2 (0.10–0.20)	ap	≤ 10.0	≤ 12.0	≤ 12.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0
				ap x ae	≤ 8	≤ 12	≤ 12	≤ 18	≤ 25	≤ 45	≤ 45	≤ 45
Grey Cast Iron below 160-260HB	JC8118	210 (210–250)	0.35 (0.20–0.35)	ap	≤ 10.0	≤ 12.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0
				ap x ae	≤ 15	≤ 24	≤ 30	≤ 40	≤ 45	≤ 45	≤ 45	≤ 45
Nodular Cast Iron below 170-300HB	JC8118	150 (110–150)	0.3 (0.15–0.30)	ap	≤ 10.0	≤ 12.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0
				ap x ae	≤ 15	≤ 24	≤ 30	≤ 40	≤ 45	≤ 45	≤ 45	≤ 45
Austenitic Stainless Steel	JC8050	120 (100–120)	0.2 (0.10–0.20)	ap	≤ 10.0	≤ 12.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0
				ap x ae	≤ 15	≤ 24	≤ 30	≤ 40	≤ 45	≤ 45	≤ 45	≤ 45
Martensitic Stainless Steel	JC8118	180 (140–180)	0.3 (0.15–0.30)	ap	≤ 10.0	≤ 12.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0
				ap x ae	≤ 15	≤ 24	≤ 30	≤ 40	≤ 45	≤ 45	≤ 45	≤ 45
Aluminium	FC18	900 (700–900)	0.2 (0.07–0.20)	ap	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0	≤ 15.0
				ap x ae	≤ 75	≤ 75	≤ 75	≤ 75	≤ 75	≤ 75	≤ 75	≤ 75

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. In case of chatter occuring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use airblow. (For Aluminium machining Wet cutting is recommended.)

■Recommended Cutting Conditions | Face Milling | SSV type

Material	Grade	*Vc* (m/min)	*fz* (mm/t)		Tool dia. (mm)							
					25	32	40	50	63	80	100	125
Carbon Steel below 250HB	JC8050	150 (110–150)	0.35 (0.20–0.35)	ap	≤ 3.0	≤ 3.5	≤ 3.5	≤ 4.0	≤ 4.0	≤ 4.0	≤ 4.0	≤ 4.0
				ae	≤ 25	≤ 32	≤ 40	≤ 50	≤ 63	≤ 80	≤ 100	≤ 125
Cast Steel below 285HB	JC8050	150 (110–150)	0.35 (0.20–0.35)	ap	≤ 3.0	≤ 3.5	≤ 3.5	≤ 4.0	≤ 4.0	≤ 4.0	≤ 4.0	≤ 4.0
				ae	≤ 25	≤ 32	≤ 40	≤ 50	≤ 63	≤ 80	≤ 100	≤ 125
Tool & Die Steel below 255HB	JC8050	150 (110–150)	0.30 (0.15–0.30)	ap	≤ 3.0	≤ 3.5	≤ 3.5	≤ 4.0	≤ 4.0	≤ 4.0	≤ 4.0	≤ 4.0
				ae	≤ 25	≤ 32	≤ 40	≤ 50	≤ 63	≤ 80	≤ 100	≤ 125
Mold Steel 30–36HRC	JC8118	130 (110–130)	0.30 (0.15–0.30)	ap	≤ 3.0	≤ 3.5	≤ 3.5	≤ 4.0	≤ 4.0	≤ 4.0	≤ 4.0	≤ 4.0
				ae	≤ 25	≤ 32	≤ 40	≤ 50	≤ 63	≤ 80	≤ 100	≤ 125
Mold Steel 38–43HRC	JC8118	110 (90–110)	0.25 (0.15–0.25)	ap	≤ 2.0	≤ 2.5	≤ 2.5	≤ 3.0	≤ 3.0	≤ 3.0	≤ 3.0	≤ 3.0
				ae	≤ 25	≤ 32	≤ 40	≤ 50	≤ 63	≤ 80	≤ 100	≤ 125
Hardened Die Steel 42–52HRC	JC8118	90 (70–90)	0.20 (0.10–0.20)	ap	≤ 1.5	≤ 2.0	≤ 2.0	≤ 2.5	≤ 2.5	≤ 2.5	≤ 2.5	≤ 2.5
				ae	≤ 20	≤ 26	≤ 32	≤ 40	≤ 55	≤ 65	≤ 80	≤ 100
Grey Cast Iron below 160–260HB	JC8118	200 (130–200)	0.35 (0.20–0.35)	ap	≤ 5.0	≤ 5.5	≤ 5.5	≤ 6.0	≤ 6.0	≤ 6.0	≤ 6.0	≤ 6.0
				ae	≤ 25	≤ 32	≤ 40	≤ 50	≤ 63	≤ 80	≤ 100	≤ 125
Nodular Cast Iron below 170–300HB	JC8118	130 (110–130)	0.30 (0.15–0.30)	ap	≤ 3.0	≤ 3.5	≤ 3.5	≤ 4.0	≤ 4.0	≤ 4.0	≤ 4.0	≤ 4.0
				ae	≤ 25	≤ 32	≤ 40	≤ 50	≤ 63	≤ 80	≤ 100	≤ 125
Austenitic Stainless Steel	JC8050	110 (90–110)	0.20 (0.10–0.20)	ap	≤ 3.0	≤ 3.5	≤ 3.5	≤ 4.0	≤ 4.0	≤ 4.0	≤ 4.0	≤ 4.0
				ae	≤ 20	≤ 26	≤ 32	≤ 40	≤ 55	≤ 65	≤ 80	≤ 100
Martenstic Stainless Steel	JC8118	150 (110–150)	0.30 (0.15–0.30)	ap	≤ 3.0	≤ 3.5	≤ 3.5	≤ 4.0	≤ 4.0	≤ 4.0	≤ 4.0	≤ 4.0
				ae	≤ 25	≤ 32	≤ 40	≤ 50	≤ 63	≤ 80	≤ 100	≤ 125
Aluminium	FC18	900 (700–900)	0.20 (0.07–0.20)	ap	≤ 7.0	≤ 7.0	≤ 7.0	≤ 7.0	≤ 7.0	≤ 7.0	≤ 7.0	≤ 7.0
				ae	≤ 18	≤ 22	≤ 28	≤ 35	≤ 44	≤ 56	≤ 70	≤ 87

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. In case of chatter occuring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use airblow. (For Aluminium machining Wet cutting is recommended.)

■Recommended Cutting Conditions | Shoulder Milling | SSVL type

Material	Grade	*Vc* (m/min)	Tool dia. (mm)					
			32			40		
			ap(mm)	ap x ae(mm²)	*fz* (mm/t)	ap(mm)	ap x ae(mm²)	*fz* (mm/t)
Carbon Steel below 250HB	JC8050	160	≤ 43	≤ 86	0.23–0.27	≤ 57	≤ 171	0.23–0.27
Cast Steel below 285HB	JC8050	140	≤ 43	≤ 86	0.23–0.27	≤ 57	≤ 171	0.23–0.27
Tool & Die Steel below 255HB	JC8050	160	≤ 43	≤ 86	0.23–0.27	≤ 57	≤ 171	0.23–0.27
Mold Steel 30—36HRC	JC8118	120	≤ 43	≤ 86	0.18–0.23	≤ 57	≤ 171	0.18–0.23
Mold Steel 38—43HRC	JC8118	90	≤ 43	≤ 65	0.18–0.23	≤ 57	≤ 85	0.18–0.23
Hardened Die Steel 42—52HRC	JC8118	90	≤ 43	≤ 43	0.14–0.18	≤ 57	≤ 57	0.14–0.18
Grey Cast Iron below 160—260HB	JC8118	210	≤ 43	≤ 129	0.23–0.27	≤ 57	≤ 228	0.23–0.27
Nodular Cast Iron below 170—300HB	JC8118	130	≤ 43	≤ 129	0.18–0.23	≤ 57	≤ 228	0.18–0.23
Austenitic Stainless Steel	JC8050	100	≤ 43	≤ 86	0.14–0.18	≤ 57	≤ 171	0.14–0.18
Martensitic Stainless Steel	JC8118	150	≤ 43	≤ 86	0.18–0.23	≤ 57	≤ 171	0.18–0.23

Material	Grade	*Vc* (m/min)	Tool dia. (mm)					
			50			63		
			ap(mm)	ap x ae(mm²)	*fz* (mm/t)	ap(mm)	ap x ae(mm²)	*fz* (mm/t)
Carbon Steel below 250HB	JC8050	160	≤ 57	≤ 342	0.20–0.30	≤ 57	≤ 433	0.25–0.35
Cast Steel below 285HB	JC8050	140	≤ 57	≤ 342	0.20–0.30	≤ 57	≤ 433	0.25–0.35
Tool & Die Steel below 255HB	JC8050	160	≤ 57	≤ 239	0.20–0.30	≤ 57	≤ 302	0.25–0.35
Mold Steel 30—36HRC	JC8118	120	≤ 57	≤ 239	0.20–0.30	≤ 57	≤ 302	0.25–0.35
Mold Steel 38—43HRC	JC8118	90	≤ 57	≤ 199	0.15–0.25	≤ 57	≤ 256	0.15–0.25
Hardened Die Steel 42—52HRC	JC8118	90	≤ 57	≤ 68	0.10–0.20	≤ 57	≤ 85	0.10–0.20
Grey Cast Iron below 160—260HB	JC8118	210	≤ 57	≤ 342	0.20–0.30	≤ 57	≤ 433	0.25–0.35
Nodular Cast Iron below 170—300HB	JC8118	130	≤ 57	≤ 342	0.15–0.25	≤ 57	≤ 433	0.20–0.30
Austenitic Stainless Steel	JC8050	100	≤ 57	≤ 239	0.10–0.20	≤ 57	≤ 302	0.10–0.20
Martensitic Stainless Steel	JC8118	150	≤ 57	≤ 342	0.15–0.25	≤ 57	≤ 433	0.20–0.30

Note) 1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. In case of chatter occuring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use airblow.

MIRROR BALL — BNM Type

C - Body | Slotting | Copy Milling | Pocket Milling

BNM TYPE — **Shank Type**

High Precision Indexable Ball Nose End Mill

- Ball radius accuracy (with holder): **below ±0.010 mm**.
  Insert ball radius accuracy: **below ±0.006 mm**.



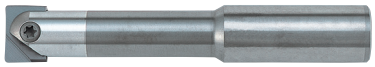



Fig.1

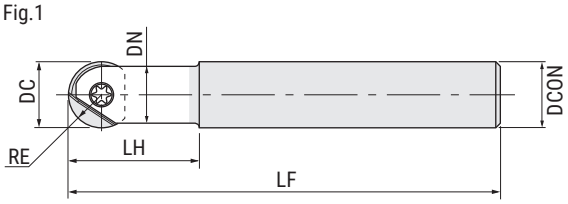
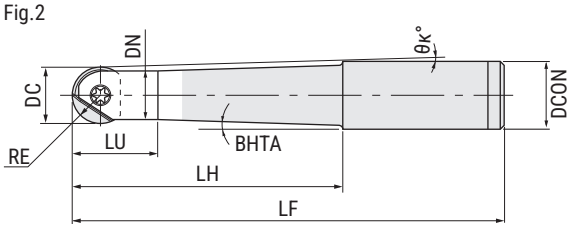


Fig.2



Cat.No.	Stock	Dimensions (mm)									Parts		Inserts	Fig.
		DC	RE	LU	LH	LF	DN	BHTA	θk	DCON	Screws	Wrench		
BNMS-060017S-S06C	●	6	3	–	17	60	5.5	–	–	6	FSW-2005H	A-06	BNM-060	1
BNMS-060030T-S10C	●	6	3	15	30	80	5.5	6°	4°14'	10				2
BNMM-060035S-S06C	●	6	3	–	35	92	5.5	–	–	6				1
BNML-060017S-S06C	●	6	3	–	17	120	5.5	–	–	6				1
BNMS-080025S-S08C	●	8	4	–	25	90	7.5	–	–	8	FSW-2506H	A-07	BNM-080 RNM-080	1
BNMM-080035S-S08C	●	8	4	–	35	92	7.5	–	–	8				1
BNML-080075S-S08C	●	8	4	–	75	140	7.5	–	–	8				1
BNML-080095S-S08C	●	8	4	–	95	160	7.5	–	–	8				1
BNML-080075T-S12C	●	8	4	20	75	132	7.5	2°	1°37'	12				2
BNMS-100030S-S10C	●	10	5	–	30	100	9.5	–	–	10	FSW-3007H	A-08	BNM-100/RNM-100	1
BNMM-100043S-S10C	●	10	5	–	43	100	9.5	–	–	10				1
BNMS-120028S-S12C	●	12	6	–	28	84	11.5	–	–	12	KSW-3509	A-15	BNM-120/RNM-120	1
BNMM-120053S-S12C	●	12	6	–	53	110	11.5	–	–	12				1

Screw	Torque(N.m)
FSW-2005H	0.5
FSW-2506H	0.9
FSW-3007H	1.2
KSW-3509	3.0

MIRROR BALL — BNM Type

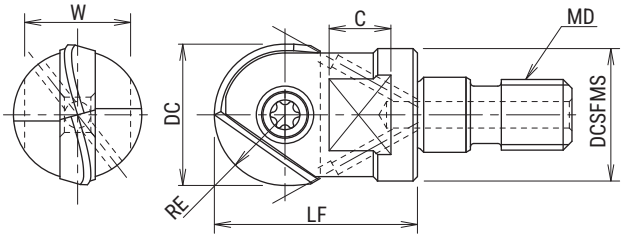
Through coolant hole | Slotting | Copy Milling | Pocket Milling

MBX TYPE

Modular Type

- Ball radius accuracy (with holder): **below ±0.010 mm**.
  Insert ball radius accuracy: **below ±0.006 mm**.
- O.D. runout (with MSN carbide shank holder): below 0.015 mm.

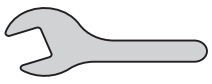




Cat.No.	Stock	Dimensions (mm)							Parts		Inserts
		DC	RE	LF	DCSFMS	MD	C	W	Screws	Wrench	
MBX-100-M6	●	10	5	18	9.7	M6	6.5	8	FSW-3007H	A-08	BNM-100
MBX-120-M6	●	12	6	20	11.5	M6	6.5	8	KSW-3509	A-15	BNM-120
MBX-160-M8	●	16	8	23	15	M8	8	12	FSW-4013H	A-15	BNM-160
MBX-200-M10	●	20	10	30	19	M10	8	14	FSW-5016H	A-20W	BNM-200
MBX-250-M12	●	25	12.5	35	24	M12	10	17	FSW-6020	A-30	BNM-250
MBX-300-M16	●	30	15	43	29	M16	12.5	22	KSW-8025	A-30	BNM-300/320

Screw	Torque(N.m)
FSW-3007H	1.2
KSW-3509	3.0
FSW-4013H	3.0
FSW-5016H	4.0
FSW-6020	6.0
KSW-8025	6.0

■ Spanner



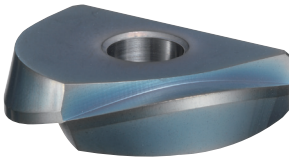
Cat.No.	MD	Torque	width across flat	Thickness	Length
DS-08	M6	8.0 N.m	8	4	85
DS-12	M8	16 N.m	12	4	93

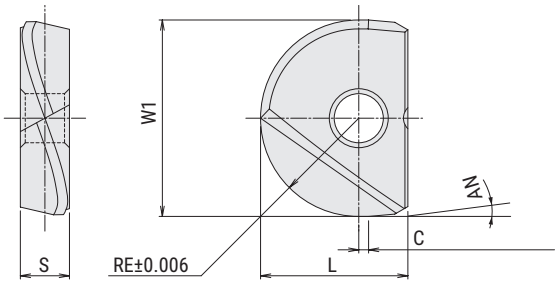
MIRROR BALL — BNM Type

BNM-TG TYPE — Helical geometry

good for finishing hard material/weld up to 60 HRC

Radius accuracy ± 0.006 mm



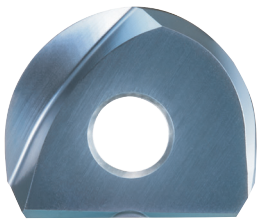


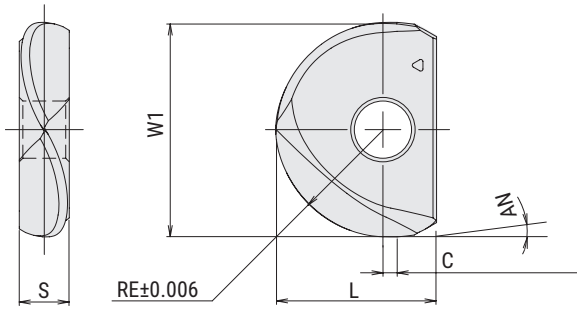
Cat.No.	PVD Coating	Dimensions(mm)					
	DH102	RE	L	W1	S	C	AN
BNM-060-TG	●	3	5	6	2	–	10°
BNM-080-TG	●	4	7	8	2.4	0.5	5°
BNM-100-TG	●	5	8.5	10	2.6	1	5°
BNM-120-TG	●	6	10	12	3	1.5	5°
BNM-160-TG	●	8	12	16	4	1.5	5°
BNM-200-TG	●	10	15	20	5	2	5°
BNM-250-TG	●	12.5	18.5	25	6	2	5°
BNM-300-TG	○	15	22.5	30	7	2	5°
BNM-320-TG	●	16	32	32	7	2	5°

BNM-TS TYPE — High Helix geometry

good for semi-finishing & finishing hard materials up to 60HRC

Radius accuracy ± 0.006 mm





Cat.No.	PVD Coating	Dimensions(mm)					
	DH102	RE	W1	L	S	C	AN
BNM-060-TS	●	3	6	5	2	–	10°
BNM-080-TS	●	4	8	7	2.4	0.5	5°
BNM-100-TS	●	5	10	8.5	2.6	1	5°
BNM-120-TS	●	6	12	10	3	1.5	5°
BNM-160-TS	●	8	16	12	4	1.5	5°
BNM-200-TS	●	10	20	15	5	2	5°
BNM-250-TS	●	12.5	25	18.5	6	2	5°
BNM-300-TS	○	15	30	22.5	7	2	5°
BNM-320-TS	●	16	32	23.5	7	2	5°

BNM-SS TYPE

Sharp Helical geometry

good for finishing and semi finishing general steel , mold steel & stainless steel

Radius accuracy
± 0.006 mm

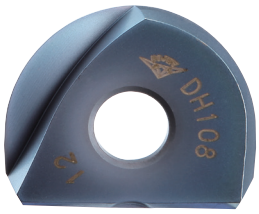
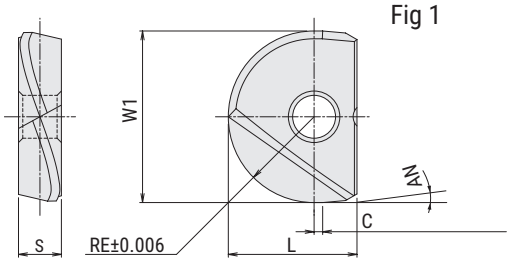


Fig 1



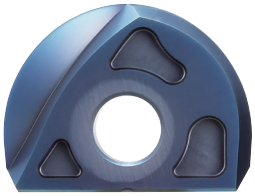
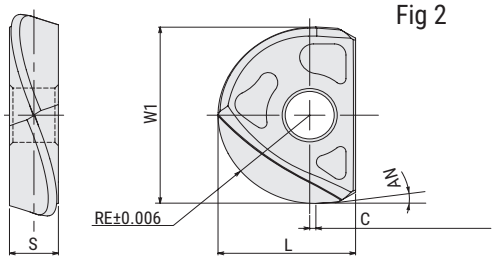


Fig 2



Cat.No.	PVD Coating		Dimensions(mm)						Fig.
	DH108	DS108	RE	L	W1	S	C	AN	
BNM-060-SS	●	●	3	5	6	2	–	10°	1
BNM-080-SS	●	●	4	7	8	2.4	0.5	5°	1
BNM-100-SS	●	●	5	8.5	10	2.6	1	5°	1
BNM-120-SS	●	●	6	10	12	3	1	5°	1
BNM-160-SS	●	●	8	12	16	4	1	5°	1
BNM-200-SS	●	●	10	15	20	5	1	5°	2
BNM-250-SS	●	●	12.5	18.5	25	6	1	5°	2
BNM-300-SS	○	○	15	22.5	30	7	1	5°	2
BNM-320-SS	●	●	16	23.5	32	7	1	5°	2

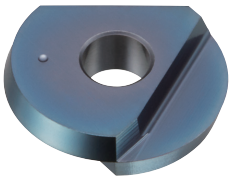
MIRROR BALL — BNM Type

BNM TYPE

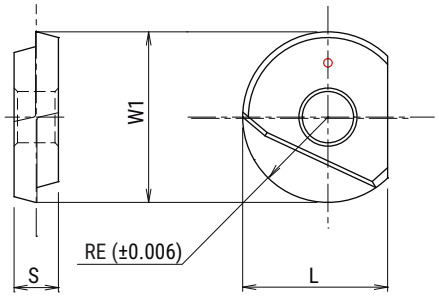
Neutral style geometry

strictly for finishing applications

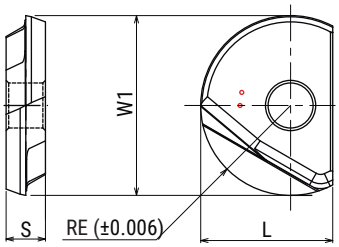
Radius accuracy
± 0.006 mm

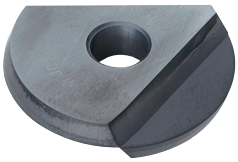


● DH111 (W1≤10)

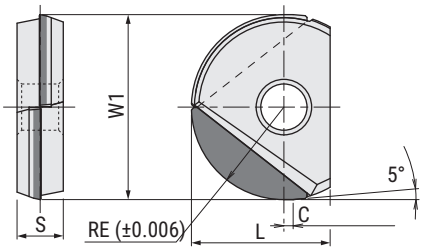


● DH111 (W1≥12)





● CBN



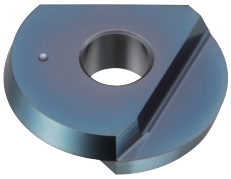
Cat.No.	PVD Coating	CBN	Dimensions(mm)				
	DH111	JBN245	RE	W1	L	C	S
BNM-060	●		3	6	5	–	2
BNM-080	●		4	8	7	–	2.4
BNM-100	●		5	10	8.5	–	2.6
BNM-120	●		6	12	10	–	3
BNM-160	●	○	8	16	12	0.8	4
BNM-200	●	○	10	20	15	1	5
BNM-250	●	○	12.5	25	18.5	1	6
BNM-300	○	○	15	30	22.5	1	7
BNM-320	●		16	32	23.5	–	7

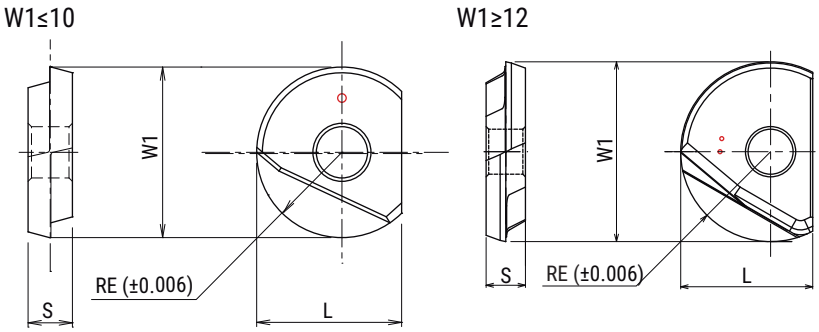
BNM TYPE

Neutral style geometry

good for semi-finishing & finishing non-ferrous metals such as aluminium, copper

Radius accuracy ± 0.006 mm





Cat.No.	Diamond Coating	Uncoated	Dimensions(mm)				
	JC10000	KT9	RE	W1	L	C	S
BNM-060	○	●	3	6	5	–	2
BNM-080	○	●	4	8	7	–	2.4
BNM-100	○	●	5	10	8.5	–	2.6
BNM-120	○	●	6	12	10	–	3
BNM-160	○	●	8	16	12	0.8	4
BNM-200	○	●	10	20	15	1	5

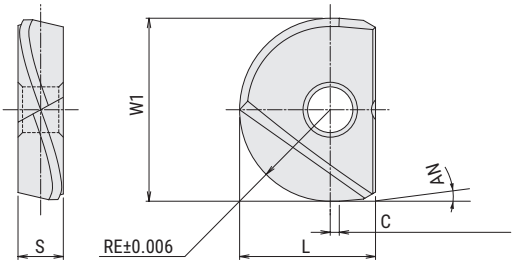
BNM-S TYPE

Sharp Helical geometry

good for semi-finishing & finishing non-ferrous metals such as aluminium, copper

Radius accuracy ± 0.006 mm





Cat.No.	Uncoated	DLC Coating	Dimensions (mm)					
	FZ05	JC20003	RE	L	W1	S	C	AN
BNM-060-S	●	○	3	5	6	2	–	10°
BNM-080-S	●	○	4	7	8	2.4	0.5	5°
BNM-100-S	●	○	5	8.5	10	2.6	1	5°
BNM-120-S	●	○	6	10	12	3	1	5°
BNM-160-S	●	○	8	12	16	4	1	5°
BNM-200-S	●	○	10	15	20	5	1	5°
BNM-250-S	○	○	12.5	18.5	25	6	1	5°
BNM-300-S	○	○	15	22.5	30	7	1	5°

■ Controlled Torque Wrenches (with replaceable blade)

Wrenches are pre-set to protect screws and bodies against damage during both the tightening and loosening process



● Controlled Torque Wrenches (with replaceable blade)

Cat. No.	Torque(N.m)	crew torque	Replacement blade	Applicable inserts
TQC-06	T6	0.5Nm	B-06	BNM-060… HRM-060…, FRM-060…
TQC-07	T7	0.9Nm	B-07	BNM-080… RNM-080…, HRM-080/090…, FRM-080…
TQC-08	T8	1.2Nm	B-08	BNM-100… RNM-100…, HRM-100/110…, FRM-100…
TQC-10	T10	2.0Nm	B-10	BNM-120… RNM-120…, HRM-120/130…, FRM-120/130…

Insert Mounting Information

1. Make sure the insert seat on body is carefully cleaned.
2. Make sure insert itself is clean, especially hole and face location.
3. Change insert screw when threads start to wear. (approximately every 10-15 inserts)
4. Do not over tighten screw, see table for torque specifications.

■ Grade Selection Guide

Material	BNM				BNM-S		BNM -SS		BNM -TG	BNM -TS
	DH111	JC10000	KT9	JBN245	FZ05	JC20003	DH108	DS108	DH102	DH102
Carbon steel below 250HB	◎☆						◎			
Tool & Die steel below 255HB	◎☆						◎			
Mold steel 30 - 36HRC	○						◎			
Mold steel 38 - 43HRC	○						◎			
Hardened die steel 42 - 52HRC	○						◎		○	○
Hardened die steel 55 - 62HRC							○		◎	◎
HSS 63 - 70HRC									◎	◎
Grey cast iron 160 - 260HB	○			★			○		◎	◎
Nodular cast iron 170 - 300HB	○			★			○		◎	◎
Austenitic stainless steel (304,316,317) 17Cr	◎☆						◎			
Ferritic & martensitic stainless steel (403,420J2,430) 13Cr	◎☆						◎			
Aluminium alloy (A5052)			◎		◎	◎				
Aluminium alloy (A7075)			◎		◎	◎				
Aluminium alloy Si below13%			◎		◎	◎				
Copper alloy (C1100)			◎		◎	◎				
Graphite		○				◎				
Titanium alloy (Ti-6Al-4V) 35 - 43HRC	◎☆						◎	◎		
Heat resistant alloy (INCO718) 35 - 43HRC	◎☆						◎			

◎ : First choice ○ : Second choice ☆ : Wet cutting ★ : High speed machining

MIRROR BALL — BNM Type

■ Recommended Cutting Conditions | BNM / BNM-SS / BNM-TS / BNM-TG type

Material	Grade		Tool dia. (mm)								
			6	8	10	12	16	20	25	30	32
Carbon steel below 250HB	BNM (DH111) BNM-SS (DH108)	*n* (min^{-1})	18,570	13,930	12,730	10,610	8,950	7,160	6,370	5,310	4,970
		Vf (mm/min)	5,570	4,180	5,090	4,240	5,370	5,010	4,460	3,720	3,480
		ap (mm)	0.1	0.1	0.15	0.15	0.15	0.15	0.15	0.15	0.15
		ae (mm)	0.1	0.15	0.2	0.2	0.25	0.3	0.4	0.5	0.5
Tool & Die steel below 255HB	BNM (DH111) BNM-SS (DH108)	*n* (min^{-1})	18,570	13,930	12,730	10,610	8,950	7,160	6,370	5,310	4,970
		Vf (mm/min)	5,570	4,180	5,090	4,240	5,370	5,010	4,460	3,720	3,480
		ap (mm)	0.1	0.1	0.15	0.15	0.15	0.15	0.15	0.15	0.15
		ae (mm)	0.1	0.15	0.2	0.2	0.25	0.3	0.4	0.5	0.5
Mold steel 30 - 36HRC	BNM (DH111) BNM-SS (DH108)	*n* (min^{-1})	18,570	13,930	12,730	10,610	8,950	7,160	6,370	5,310	4,970
		Vf (mm/min)	5,570	4,180	5,090	4,240	5,370	5,010	4,460	3,720	3,480
		ap (mm)	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		ae (mm)	0.1	0.15	0.2	0.2	0.25	0.3	0.4	0.5	0.5
Mold steel 38 - 43HRC	BNM (DH111) BNM-SS (DH108)	*n* (min^{-1})	15,920	11,940	11,140	9,280	7,960	6,370	5,730	4,770	4,480
		Vf (mm/min)	3,180	2,390	3,340	2,780	3,980	3,820	3,440	2,860	2,690
		ap (mm)	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		ae (mm)	0.1	0.15	0.2	0.2	0.25	0.3	0.4	0.5	0.5
Hardened die steel 42 - 52HRC	BNM (DH111) BNM-SS (DH108)	*n* (min^{-1})	13,260	9,950	9,550	7,960	6,960	5,570	5,090	4,240	3,980
		Vf (mm/min)	2,650	1,990	2,870	2,390	3,480	3,340	3,050	2,540	2,390
		ap (mm)	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		ae (mm)	0.1	0.15	0.2	0.2	0.25	0.3	0.4	0.5	0.5
Hardened die steel 55 - 62HRC	BNM-TG (DH102) BNM-TS (DH102)	*n* (min^{-1})	10,610	7,960	7,960	6,630	5,970	4,770	4,460	3,710	3,480
		Vf (mm/min)	2,120	1,590	2,390	1,990	2,990	2,860	2,680	2,230	2,090
		ap (mm)	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		ae (mm)	0.1	0.15	0.15	0.2	0.25	0.3	0.4	0.5	0.5
HSS 63 - 70HRC	BNM-TG (DH102) BNM-TS (DH102)	*n* (min^{-1})	7,960	5,970	6,370	5,310	4,970	3,980	3,820	3,180	2,980
		Vf (mm/min)	1,590	1,190	1,270	1,060	1,490	1,190	1,530	1,270	1,190
		ap (mm)	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
		ae (mm)	0.05	0.1	0.1	0.1	0.1	0.15	0.2	0.3	0.3
Grey & Nodular cast iron below 300 HB	BNM (DH111) BNM-TG BNM-TS (DH102)	*n* (min^{-1})	18,570	13,930	12,730	10,610	8,950	7,160	6,370	5,310	4,970
		Vf (mm/min)	7,430	5,570	6,370	5,310	6,270	5,730	5,100	4,250	3,980
		ap (mm)	0.1	0.1	0.15	0.15	0.15	0.15	0.15	0.15	0.15
		ae (mm)	0.1	0.15	0.2	0.2	0.25	0.3	0.4	0.5	0.5
Stainless steel	BNM (DH111) BNM-SS (DH108)	*n* (min^{-1})	18,570	13,930	12,730	10,610	8,950	7,160	6,370	5,310	4,970
		Vf (mm/min)	5,570	4,180	5,090	4,240	5,370	5,010	4,460	3,720	3,480
		ap (mm)	0.1	0.1	0.15	0.15	0.15	0.15	0.15	0.15	0.15
		ae (mm)	0.1	0.15	0.2	0.2	0.25	0.3	0.4	0.5	0.5
Titanium alloy (Ti-6Al-4V)	BNM (DH111) BNM-SS (DS108)	*n* (min^{-1})	10,610	7,960	9,550	7,960	5,970	4,770	4,460	3,710	3,480
		Vf (mm/min)	3,180	2,390	3,820	3,180	2,990	2,860	2,680	2,230	2,090
		ap (mm)	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		ae (mm)	0.1	0.15	0.15	0.2	0.25	0.3	0.4	0.5	0.5
Heat resistant alloy (INCO718)	BNM (DH111) BNM-SS (DS108)	*n* (min^{-1})	7,960	5,970	6,370	5,310	4,970	3,980	3,820	3,180	2,980
		Vf (mm/min)	1,590	1,190	1,910	1,590	1,990	1,590	1,530	1,270	1,190
		ap (mm)	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		ae (mm)	0.1	0.1	0.1	0.1	0.1	0.15	0.2	0.3	0.3

Note) 1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. These cutting conditions represent stable machining at length 3 x Dc.
Please adjust cutting conditions according to overhang length.
3. In case of chatter ocurring, recommended to reduce ap or feed.
4. Use air blow.

Overhang length	*n* (min^{-1})	*Vf* (mm/min)
~3Dc	100%	100%
3Dc~5Dc	70%	70%
5Dc~10Dc	50%	50%

■ Recommended Cutting Conditions | BNM (CBN) type

Material	Cat.No	Grade		Tool dia.(mm)			
				16	20	25	30
Grey cast iron 160- 260 HB	BNM	JBN245	*n* (min^{-1})	23,870	19,100	15,280	12,730
			Vf (mm/min)	11,940	11,460	9,170	8,910
			ap (mm)	0.05	0.05	0.05	0.05
			ae (mm)	0.25	0.3	0.4	0.5
Nodular cast iron 170- 300 HB	BNM	JBN245	*n* (min^{-1})	19,890	15,920	12,730	10,610
			Vf (mm/min)	7,960	7,960	6,370	6,370
			ap (mm)	0.05	0.05	0.05	0.05
			ae (mm)	0.25	0.3	0.4	0.5

Note
1. These cutting conditions represent on high speed machine.
2. These cutting conditions represent stable machining at length 3 x Dc.
   Please adjust cutting conditions according to overhang length.
3. Use carbide shank holder.
4. For better surface finish , mist coolant is recommended.
5. Plunging is not recommended.
6 Please keep the stock uniform by pre-machining.

Overhang length	*n* (min^{-1})	*Vf* (mm/min)
~3Dc	100%	100%
3Dc~5Dc	70%	70%
5Dc~10Dc	50%	50%

■ Recommended Cutting Conditions | BNM / BNM-S type

Material	Cat.No	Grade		Tool dia.(mm)					
				6	8	10	12	16	20
Aluminium	BNM BNM-S	KT9 FZ05 JC20003	*n* (min^{-1})	23,870	17,900	15,920	13,260	10,940	8,750
			Vf (mm/min)	9,550	7,160	7,960	6,630	7,660	7,000
			ap (mm)	0.2	0.2	0.25	0.25	0.25	0.25
			ae (mm)	0.1	0.15	0.2	0.2	0.25	0.3
Copper alloy	BNM BNM-S	KT9 FZ05 JC20003	*n* (min^{-1})	23,870	17,900	15,920	13,260	10,940	8,750
			Vf (mm/min)	9,550	7,160	7,960	6,630	7,660	7,000
			ap (mm)	0.15	0.15	0.2	0.2	0.2	0.2
			ae (mm)	0.1	0.15	0.2	0.2	0.25	0.3
Graphite	BNM BNM-S	JC10000 JC20003	*n* (min^{-1})	23,870	17,900	15,920	13,260	10,940	8,750
			Vf (mm/min)	9,550	7,160	7,960	6,630	7,660	7,000
			ap (mm)	0.15	0.15	0.2	0.2	0.2	0.2
			ae (mm)	0.1	0.15	0.2	0.2	0.25	0.3

Note) 1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. These cutting conditions represent stable machining at length 3 x Dc.
   Please adjust cutting conditions according to overhang length.
3. In case of chatter ocurring, recommended to reduce ap or feed.
4. Use air blow.

Overhang length	*n* (min^{-1})	*Vf* (mm/min)
~3Dc	100%	100%
3Dc~5Dc	70%	70%
5Dc~10Dc	50%	50%

MIRROR RADIUS — RNM Type

C-Body | Face Milling | Shoulder Milling | Copy Milling | Pocket Milling | Helical Interpolation

RNM TYPE

Shank Type

High Precision Indexable Radius End Mill

● Corner radius accuracy below ±0.010mm



Fig.1

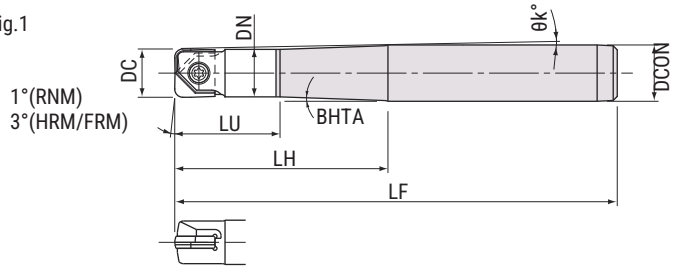
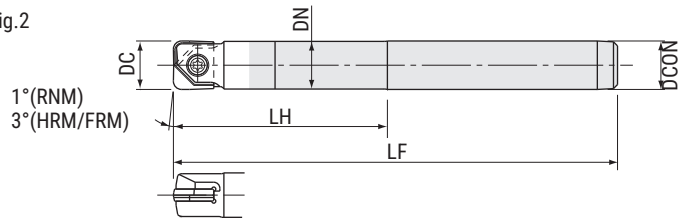


Fig.2



Cat.No.	Stock	Dimensions (mm)								Parts		Inserts	Fig.
		DC	LU	LH	LF	DN	BHTA	θk	DCON	Screws	Wrench		
RNMS-060015U-S06C	●	6	–	15	60	5.7	–	–	6	FSW-2005H	A-06	RNM-060 HRM-060 FRM-060	2
RNMM-060030U-S06C	●	6	–	30	80	5.7	–	–	6				2
RNMS-080020U-S08C	●	8	–	20	70	7.6	–	–	8	FSW-2506H	A-07	RNM-080 HRM-080/090 FRM-080	2
RNMM-080040U-S08C	●	8	–	40	90	7.6	–	–	8				2
RNMM-080053T-S12C	●	8	20	53	110	7.8	2°	2°12'	12				1
RNML-080075S-S08C	●	8	–	75	140	7.8	–	–	8				2
RNMM-100050S-S10C	●	10	–	50	110	9.8	–	–	10	FSW-3007H	A-08	RNM-100 HRM-100/110 FRM-100	2
RNML-100075S-S10C	●	10	–	75	140	9.8	–	–	10				2
RNMM-120053S-S12C	●	12	–	53	110	11.8	–	–	12	KSW-3509	A-15	RNM-120 HRM-120/130 FRM-120	2
RNML-120095S-S12C	●	12	–	95	160	11.8	–	–	12				2

Screw	Torque (N.m)
FSW-2005H	0.5
FSW-2506H	0.9
FSW-3007H	1.2
KSW-3509	3.0

Through coolant hole | Face Milling | Shoulder Milling | Copy Milling | Pocket Milling | Helical Interpolation

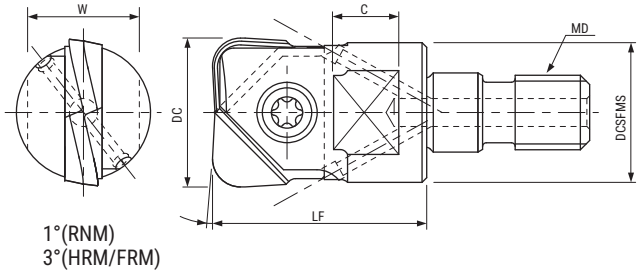
MRX TYPE

Modular Type

High Precision Indexable Radius End Mill

- RNM / Corner radius accuracy below ±0.010mm
- HRM / Corner radius accuracy ±0.015 mm
- FRM / Corner radius accuracy ±0.010 mm
- O.D. run out / MRX + MSN carbide shank below ±0.015mm

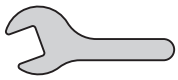




Cat.No.	Stock	Dimensions (mm)						Parts		Inserts
		DC	LF	DCSFMS	MD	C	W	Screws	Wrench	
MRX-100-M6	●	10	18	9.7	M6	6.5	8	FSW-3007H	A-08	RNM-100 HRM-100/110 FRM-100...
MRX-120-M6	●	12	20	11.5	M6	6.5	8	KSW-3509	A-15	RNM-120 HRM-120/130 FRM-120
MRX-160-M8	●	16	23	15	M8	8	12	FSW-4013H	A-15	RNM-160 HRM-160/170 FRM-160/170...
MRX-200-M10	●	20	30	18.5	M10	8	14	FSW-5016H	A-20W	HRM-200/220 FRM-200/210
MRX-250-M12	●	25	35	24	M12	10	17	FSW-6020	A-30	FRM-250
MRX-300-M16	○	30	43	29	M16	12.5	22	KSW-8025	A-30	FRM-300
MRX-320-M16	●	32	43	30	M16	12.5	22	KSW-8025	A-30	FRM-320

Screw	Torque (N.m)
FSW-3007H	1.2
KSW-3509	3.0
FSW-4013H	3.0
FSW-5016H	4.0
FSW-6020	6.0
KSW-8025	6.0

■ Spanner



Cat.No.	MD	Torque	width across flat	Thickness	Length
DS-08	M6	8.0 N.m	12	4	85
DS-12	M8	16 N.m	12	4	93

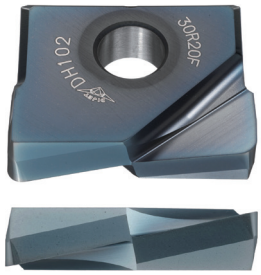
MIRROR RADIUS RNM Type

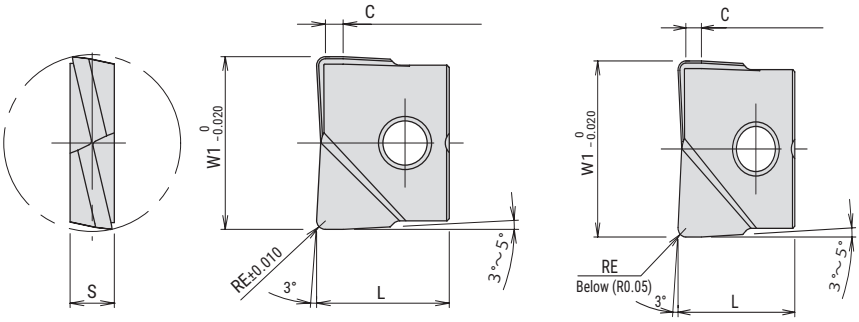
FRM TYPE **High feed geometry**

from Semi-finishing to finishing

Corner radius accuracy ±0.010 mm

■FRM-□□□-R0





Cat.No.	PVD Coating		Dimensions(mm)				
	DH102	JC8015	RE	L	W1	S	C
FRM-060-R0		●	※	5	6	2	0.8
FRM-060-R03	●	●	0.3	5	6	2	0.8
FRM-060-R05	●	●	0.5	5	6	2	0.8
FRM-060-R10	●	●	1	5	6	2	0.8
FRM-080-R0		●	※	7	8	2.4	1.2
FRM-080-R03	●	●	0.3	7	8	2.4	1.2
FRM-080-R05	●	●	0.5	7	8	2.4	1.2
FRM-080-R10	●	●	1	7	8	2.4	1.2
FRM-100-R0		●	※	8.5	10	2.6	1.5
FRM-100-R03	●	●	0.3	8.5	10	2.6	1.5
FRM-100-R05	●	●	0.5	8.5	10	2.6	1.5
FRM-100-R10	●	●	1	8.5	10	2.6	1.5
FRM-100-R20	●	●	2	8.5	10	2.6	1.5
FRM-120-R0		●	※	10	12	3	1.5
FRM-120-R03	●	●	0.3	10	12	3	1.5
FRM-120-R05	●	●	0.5	10	12	3	1.5
FRM-120-R10	●	●	1	10	12	3	1.5
FRM-120-R15	●		1.5	10	12	3	1.5
FRM-120-R20	●	●	2	10	12	3	1.5
FRM-120-R30	●		3	10	12	3	1.5
FRM-130-R05		●	0.5	10	13	3	1.5
FRM-130-R10		●	1	10	13	3	1.5

MIRROR RADIUS — RNM Type

Cat.No.	PVD Coating		Dimensions(mm)				
	DH102	JC8015	RE	L	W1	S	C
FRM-160-R0		●	※	12	16	4	2
FRM-160-R03	●	●	0.3	12	16	4	2
FRM-160-R05	●	●	0.5	12	16	4	2
FRM-160-R10	●	●	1	12	16	4	2
FRM-160-R15	●		1.5	12	16	4	2
FRM-160-R20	●	●	2	12	16	4	2
FRM-160-R30	●		3	12	16	4	2
FRM-170-R03		●	0.3	12	17	4	2
FRM-170-R05		●	0.5	12	17	4	2
FRM-170-R10	●	●	1	12	17	4	2
FRM-170-R20		●	2	12	17	4	2
FRM-200-R0		●	※	15	20	5	2
FRM-200-R03	●	●	0.3	15	20	5	2
FRM-200-R05	●	●	0.5	15	20	5	2
FRM-200-R10	●	●	1	15	20	5	2
FRM-200-R15	●		1.5	15	20	5	2
FRM-200-R20	●	●	2	15	20	5	2
FRM-200-R30	●	●	3	15	20	5	2
FRM-210-R05		●	0.5	15	21	5	2
FRM-210-R10	●	●	1	15	21	5	2
FRM-210-R20		●	2	15	21	5	2
FRM-250-R03	●	●	0.3	18.5	25	6	2.5
FRM-250-R05	●	●	0.5	18.5	25	6	2.5
FRM-250-R10	●	●	1	18.5	25	6	2.5
FRM-250-R15	●		1.5	18.5	25	6	2.5
FRM-250-R20	●	●	2	18.5	25	6	2.5
FRM-250-R30	●	●	3	18.5	25	6	2.5
FRM-260-R03		●	0.3	18.5	26	6	2.5
FRM-260-R05		●	0.5	18.5	26	6	2.5
FRM-260-R10		●	1	18.5	26	6	2.5
FRM-300-R03	○	○	0.3	22.5	30	7	3
FRM-300-R05	○	○	0.5	22.5	30	7	3
FRM-300-R10	○	○	1	22.5	30	7	3
FRM-300-R20	○	○	2	22.5	30	7	3
FRM-300-R30	○	○	3	22.5	30	7	3
FRM-320-R03	●	●	0.3	23.5	32	7	3
FRM-320-R05	●	●	0.5	23.5	32	7	3
FRM-320-R10	●	●	1	23.5	32	7	3
FRM-320-R20	●	●	2	23.5	32	7	3
FRM-320-R30	●		3	23.5	32	7	3

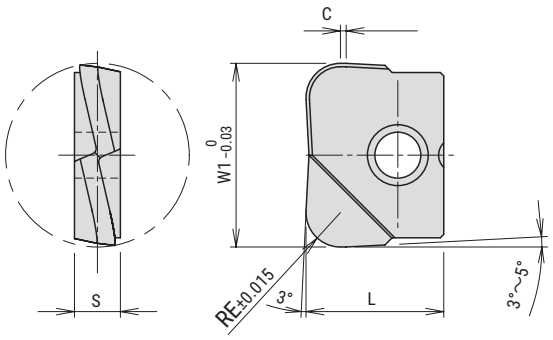
MIRROR RADIUS — RNM Type

HRM TYPE **High feed geometry**

from Semi-finishing to finishing

Corner radius accuracy ±0.015 mm



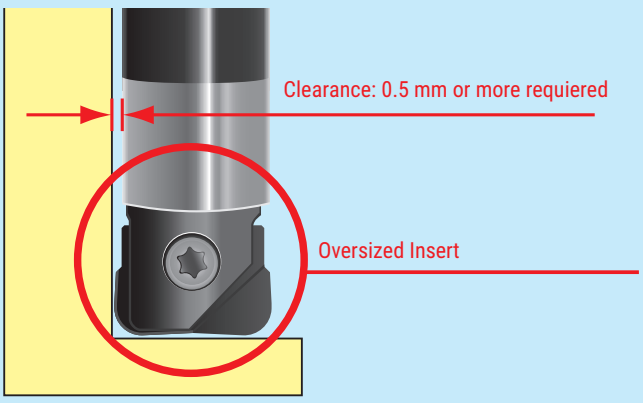


Cat.No.	PVD Coating	Dimensions(mm)				
	JC8015	RE	L	W1	S	C
HRM-060-R05	●	0.5	5	6	2	–
HRM-060-R10	●	1	5	6	2	–
HRM-060-R15	●	1.5	5	6	2	–
HRM-080-R20	●	2	7	8	2.4	0.3
HRM-090-R20	●	2	7	9	2.4	0.3
HRM-100-R20	●	2	8.5	10	2.6	0.3
HRM-110-R20	●	2	8.5	11	2.6	0.3
HRM-120-R20	●	2	10	12	3	0.5
HRM-130-R20	●	2	10	13	3	0.5
HRM-160-R20	●	2	12	16	4	0.5
HRM-160-R30	●	3	12	16	4	0.5
HRM-170-R30	●	3	12	17	4	0.5
HRM-200-R20	●	2	15	20	5	0.5
HRM-200-R30	●	3	15	20	5	0.5
HRM-220-R30	○	3	15	22	5	0.5

Mirror Radius Oversized Insert

Recommended to use oversized insert ※ for increasing side clearance to prevent the damage of shank by sticking chips.

(※) **HRM-090-R20, HRM-110-R20, HRM-130-R20, HRM-170-R30, HRM-220-R30**

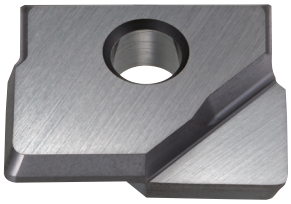


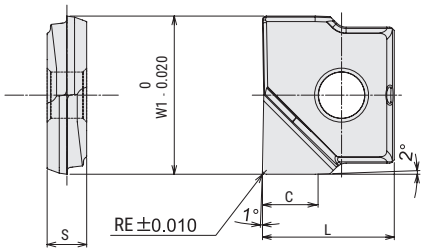
RNM TYPE

Neutral geometry

good for finishing non-ferrous materials such as Aluminium, Copper

Corner radius accuracy ±0.010 mm





Cat.No.	Diamond Coating	Uncoated	Dimensions(mm)				
	JC10000	KT9 (K10)	RE	L	W1	S	C
RNM-080-R03		○	0.3	7	8	2.4	2.7
RNM-080-R05	●	●	0.5	7	8	2.4	2.7
RNM-080-R10		●	1	7	8	2.4	2.7
RNM-100-R03		○	0.3	8.5	10	2.6	3.3
RNM-100-R05	●	●	0.5	8.5	10	2.6	3.3
RNM-100-R10	○	●	1	8.5	10	2.6	3.3
RNM-100-R15		○	1.5	8.5	10	2.6	3.3
RNM-100-R20		○	2	8.5	10	2.6	3.3
RNM-120-R03		○	0.3	10	12	3	4
RNM-120-R05	○	●	0.5	10	12	3	4
RNM-120-R10	○	●	1	10	12	3	4
RNM-120-R15		○	1.5	10	12	3	4
RNM-120-R20		●	2	10	12	3	4
RNM-160-R03		●	0.3	12	16	4	5.3
RNM-160-R05		●	0.5	12	16	4	5.3
RNM-160-R10		●	1	12	16	4	5.3
RNM-160-R15		○	1.5	12	16	4	5.3
RNM-160-R20		○	2	12	16	4	5.3
RNM-200-R03		○	0.3	15	20	5	6.7
RNM-200-R05		○	0.5	15	20	5	6.7
RNM-200-R10		●	1	15	20	5	6.7
RNM-200-R15		○	1.5	15	20	5	6.7
RNM-200-R20		○	2	15	20	5	6.7

MIRROR RADIUS — RNM Type

■Grade Selection Guide

Material	Insert	Grade	RNM		HRM	FRM	
			JC10000	KT9	JC8015	DH102	JC8015
Carbon steel below 250HB	FRM HRM	JC8015			◎		◎
Cast steel below 285HB	FRM HRM	JC8015			◎		◎
Tool & Die steel below 255HB	FRM HRM	JC8015			◎		◎
Mold steel 30 - 36HRC	FRM HRM	JC8015			◎		◎
Mold steel 38 - 43HRC	FRM HRM	JC8015			◎		◎
Hardened die steel 42 - 52HRC	FRM HRM	DH102 JC8015			○	◎	○
Hardened die steel 55 - 62HRC	FRM	DH102				◎	
HSS 63 - 70HRC	FRM	DH102				◎	
Grey & Nodular cast iron below 300HB	FRM HRM	DH102 JC8015			○	◎	○
Austenitic stainless steel (304,316,317) 17Cr	FRM HRM	JC8015			◎	○	◎
Aluminium alloy (A5052)	RNM	KT9		◎			
Copper alloy (C1100)	RNM	KT9		◎			
Graphite	RNM	JC10000	◎				
Titanium alloy (Ti-6Al-4V) 35 - 43HRC	HRM FRM	JC8015			◎		◎
Heat resistant alloy (INCO718) 35 - 43HRC	HRM FRM	JC8015			◎		◎

Note) ◎ : First choice ○ : Second choice

■ Recommended Cutting Conditions | RNM type | Side Finishing

Material	Cat.No	Grade		Tool dia.(mm)				
				8	10	12	16	20
Aluminium	RNM	KT9	***n*(min^{-1})**	13,930	11,140	9,280	6,960	5,570
			***Vf*(mm/min)**	5,570	4,460	3,710	3,500	2,800
			ap(mm)	0.4	0.5	0.6	0.8	1.0
			ae(mm)	0.2	0.2	0.2	0.2	0.2
Copper alloy	RNM	KT9	***n*(min^{-1})**	9,950	7,960	6,630	4,970	3,980
			***Vf*(mm/min)**	3,980	3,180	2,650	2,500	2,000
			ap(mm)	0.3	0.3	0.4	0.5	0.7
			ae(mm)	0.15	0.15	0.15	0.15	0.15
Graphite	RNM	JC10000	***n*(min^{-1})**	13,930	11,140	9,280	–	–
			***Vf*(mm/min)**	5,570	4,460	3,710	–	–
			ap(mm)	0.4	0.5	0.6	–	–
			ae(mm)	0.2	0.2	0.2	–	–

■ Recommended Cutting Conditions | RNM type | Bottom Finishing

Material	Cat.No	Grade		Tool dia.(mm)				
				8	10	12	16	20
Aluminium	RNM	KT9	*n* (min^{-1})	11,940	9,550	7,960	5,970	4,770
			Vf (mm/min)	4,780	3,820	3,180	3,580	2,860
			ap (mm)	0.25	0.25	0.25	0.25	0.3
			ae (mm)	1.2 (~4)	1.2 (~5)	1.5 (~5)	2.0 (~9)	2.5 (~13)
Copper alloy	RNM	KT9	*n* (min^{-1})	7,960	6,370	5,310	3,980	3,180
			Vf (mm/min)	2,390	1,910	1,590	1,190	950
			ap (mm)	0.2	0.2	0.2	0.2	0.25
			ae (mm)	1.2 (~4)	1.2 (~5)	1.5 (~5)	2.0 (~9)	2.5 (~13)
Graphite	RNM	JC10000	*n* (min^{-1})	11,940	9,550	7,960	–	–
			Vf (mm/min)	4,780	3,820	3,180	–	–
			ap (mm)	0.25	0.25	0.25	–	–
			ae (mm)	1.2 (~4)	1.2 (~5)	1.5 (~5)	–	–

Note) 1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. These cutting conditions represent stable machining at length 3 x Dc.
Please adjust cutting conditions according to overhang length.
3. In case of chatter ocurring, recommended to reduce ap or feed.
4. Use air blow.

Overhang length	*n* (min^{-1})	*Vf* (mm/min)
~3Dc	100%	100%
3Dc~5Dc	70%	70%
5Dc~10Dc	50%	50%

MIRROR RADIUS — FRM Type

■ Recommended Cutting Conditions | FRM type | Side Finishing

Material	Grade		Tool dia. (mm)								
			6	8	10	12/13	16/17	20/21	25/26	30	32
Carbon steel below 250HB	JC8015	*n* (min^{-1})	15,920	11,940	9,550	7,960	5,970	4,770	3,820	3,180	2,980
		Vf (mm/min)	3,980	2,990	2,870	2,390	2,390	1,910	1,530	1,270	1,190
		ap (mm)	0.2	0.3	0.3	0.3	0.4	0.5	0.8	1.0	1.2
		ae (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Tool & Die steel below 255HB	JC8015	*n* (min^{-1})	15,920	11,940	9,550	7,960	5,970	4,770	3,820	3,180	2,980
		Vf (mm/min)	3,980	2,990	2,870	2,390	2,390	1,910	1,530	1,270	1,190
		ap (mm)	0.2	0.3	0.3	0.3	0.4	0.5	0.8	1.0	1.2
		ae (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Mold steel 30 - 36HRC	JC8015	*n* (min^{-1})	15,920	11,940	9,550	7,960	5,970	4,770	3,820	3,180	2,980
		Vf (mm/min)	3,980	2,990	2,870	2,390	2,390	1,910	1,530	1,270	1,190
		ap (mm)	0.2	0.3	0.3	0.3	0.4	0.5	0.8	1.0	1.2
		ae (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Mold steel 38 - 43HRC	JC8015	*n* (min^{-1})	14,850	11,140	8,910	7,430	5,570	4,460	3,570	2,970	2,790
		Vf (mm/min)	3,710	2,790	2,670	2,230	1,670	1,340	1,070	890	840
		ap (mm)	0.2	0.2	0.3	0.3	0.4	0.5	0.8	1.0	1.2
		ae (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Hardened die steel 42 - 52HRC	DH102 JC8015	*n* (min^{-1})	13,260	9,950	7,960	6,630	4,970	3,980	3,180	2,650	2,490
		Vf (mm/min)	1,330	1,000	800	660	750	600	480	400	370
		ap (mm)	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.8	1.0
		ae (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Hardened die steel 55 - 62HRC	DH102	*n* (min^{-1})	10,610	7,960	6,370	5,310	3,980	3,180	2,550	2,120	1,990
		Vf (mm/min)	1,060	800	640	530	600	480	380	320	300
		ap (mm)	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.8	1.0
		ae (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
HSS 63 - 70HRC	DH102	*n* (min^{-1})	7,960	5,970	4,770	3,980	2,980	2,390	1,910	1,590	1,490
		Vf (mm/min)	320	240	290	320	300	240	190	160	150
		ap (mm)	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5
		ae (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Grey & Nodular cast iron below 300 HB	DH102 JC8015	*n* (min^{-1})	18,570	13,930	11,140	9,280	6,960	5,570	4,460	3,710	3,480
		Vf (mm/min)	6,500	4,880	3,900	3,250	3,480	3,340	2,680	2,230	2,090
		ap (mm)	0.2	0.3	0.3	0.3	0.4	0.5	0.8	1.0	1.2
		ae (mm)	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Stainless steel	JC8015	*n* (min^{-1})	14,850	11,140	8,910	7,430	5,570	4,460	3,570	2,970	2,790
		Vf (mm/min)	4,460	3,340	2,670	2,230	2,230	1,780	1,430	1,190	1,120
		ap (mm)	0.2	0.3	0.3	0.3	0.4	0.5	0.8	1.0	1.0
		ae (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Titanium alloy (Ti-6Al-4V)	JC8015	*n* (min^{-1})	5,310	3,980	3,180	2,650	1,990	1,590	1,270	1,060	990
		Vf (mm/min)	1,060	800	760	640	480	380	320	270	250
		ap (mm)	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4
		ae (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Heat resistant alloy (INCO718)	JC8015	*n* (min^{-1})	4,240	3,180	2,550	2,120	1,590	1,270	1,020	850	800
		Vf (mm/min)	850	640	610	510	380	300	260	210	200
		ap (mm)	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4
		ae (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Note) 1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. These cutting conditions represent stable machining at length 3 x Dc.
Please adjust cutting conditions according to overhang length.
3. In case of chatter ocurring, recommended to reduce ap or feed.
4. Use air blow.

Overhang length	*n* (min^{-1})	*Vf* (mm/min)
~3Dc	100%	100%
3Dc~5Dc	70%	70%
5Dc~10Dc	50%	50%

■ Recommended Cutting Conditions | FRM type | Bottom Finishing

Material	Grade		Tool dia. (mm)								
			6	8	10	12/13	16/17	20/21	25/26	30	32
Carbon steel below 250HB	JC8015	*n* (min^{-1})	13,790	10,350	8,280	6,900	5,170	4,140	3,310	2,760	2,590
		Vf (mm/min)	3,450	3,110	2,480	2,070	2,070	1,660	1,320	1,100	1,040
		ap (mm)	0.1	0.15	0.15	0.15	0.15	0.2	0.2	0.2	0.2
		ae (mm)	1.0 (~3)	1.2 (~4)	1.2 (~5)	1.5 (~5)	2.0 (~9)	2.5 (~13)	4.0 (~18)	4.2 (~23)	4.2 (~25)
Tool & Die steel below 255HB	JC8015	*n* (min^{-1})	13,790	10,350	8,280	6,900	5,170	4,140	3,310	2,760	2,590
		Vf (mm/min)	3,450	3,110	2,480	2,070	2,070	1,660	1,320	1,100	1,040
		ap (mm)	0.1	0.15	0.15	0.15	0.15	0.2	0.2	0.2	0.2
		ae (mm)	1.0 (~3)	1.2 (~4)	1.2 (~5)	1.5 (~5)	2.0 (~9)	2.5 (~13)	4.0 (~18)	4.2 (~23)	4.2 (~25)
Mold steel 30 - 36HRC	JC8015	*n* (min^{-1})	13,790	10,350	8,280	6,900	5,170	4,140	3,310	2,760	2,590
		Vf (mm/min)	3,450	3,110	2,480	2,070	2,070	1,660	1,320	1,100	1,040
		ap (mm)	0.1	0.15	0.15	0.15	0.15	0.2	0.2	0.2	0.2
		ae (mm)	1.0 (~3)	1.2 (~4)	1.2 (~5)	1.5 (~5)	2.0 (~9)	2.5 (~13)	4.0 (~18)	4.2 (~23)	4.2 (~25)
Mold steel 38 - 43HRC	JC8015	*n* (min^{-1})	12,730	9,550	7,640	6,370	4,770	3,820	3,060	2,550	2,390
		Vf (mm/min)	3,180	2,870	2,290	1,910	1,430	1,150	920	770	720
		ap (mm)	0.1	0.15	0.15	0.15	0.15	0.2	0.2	0.2	0.2
		ae (mm)	1.0 (~3)	1.2 (~4)	1.2 (~5)	1.5 (~5)	2.0 (~9)	2.5 (~13)	4.0 (~18)	4.2 (~23)	4.2 (~25)
Hardened die steel 42 - 52HRC	DH102 JC8015	*n* (min^{-1})	10,080	7,560	6,050	5,040	3,780	3,020	2,420	2,020	1,890
		Vf (mm/min)	1,010	760	610	600	570	450	360	300	280
		ap (mm)	0.05	0.06	0.08	0.1	0.1	0.15	0.15	0.15	0.15
		ae (mm)	1.0 (~3)	1.2 (~4)	1.2 (~5)	1.5 (~5)	2.0 (~9)	2.5 (~13)	4.0 (~18)	4.2 (~23)	4.2 (~25)
Hardened die steel 55 - 62HRC	DH102	*n* (min^{-1})	6,900	5,170	4,140	3,450	2,590	2,070	1,660	1,380	1,290
		Vf (mm/min)	690	520	410	410	390	310	250	210	190
		ap (mm)	0.05	0.06	0.08	0.1	0.1	0.15	0.15	0.15	0.15
		ae (mm)	1.0 (~3)	1.2 (~4)	1.2 (~5)	1.5 (~5)	2.0 (~9)	2.5 (~13)	4.0 (~18)	4.2 (~23)	4.2 (~25)
HSS 63 - 70HRC	DH102	*n* (min^{-1})	5,310	3,980	3,180	2,650	1,990	1,590	1,270	1,060	990
		Vf (mm/min)	210	160	190	210	200	160	130	110	100
		ap (mm)	0.03	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05
		ae (mm)	1.0 (~2)	1.2 (~3)	1.2 (~4)	1.5 (~5)	2.0 (~6)	2.5 (~8)	4.0 (~10)	4.2 (~12)	4.2 (~13)
Grey & Nodular cast iron below 300 HB	DH102 JC8015	*n* (min^{-1})	15,920	11,940	9,550	7,960	5,970	4,770	3,820	3,180	2,980
		Vf (mm/min)	4,780	4,180	3,340	3,180	2,390	1,910	1,910	1,590	1,490
		ap (mm)	0.1	0.15	0.15	0.2	0.2	0.2	0.2	0.2	0.2
		ae (mm)	1.0 (~3)	1.2 (~4)	1.2 (~5)	1.5 (~5)	2.0 (~9)	2.5 (~13)	4.0 (~18)	4.2 (~23)	4.2 (~25)
Stainless steel	JC8015	*n* (min^{-1})	12,730	9,550	7,640	6,370	4,770	3,820	3,060	2,550	2,390
		Vf (mm/min)	3,180	2,870	2,290	1,910	1,910	1,530	1,220	1,020	960
		ap (mm)	0.1	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
		ae (mm)	1.0 (~3)	1.2 (~4)	1.2 (~5)	1.5 (~5)	2.0 (~9)	2.5 (~13)	4.0 (~18)	4.2 (~23)	4.2 (~25)
Titanium alloy (Ti-6Al-4V)	JC8015	*n* (min^{-1})	2,920	2,190	1,750	1,460	1,090	880	700	580	550
		Vf (mm/min)	580	440	350	290	220	180	140	120	110
		ap (mm)	0.1	0.15	0.15	0.15	0.15	0.2	0.2	0.2	0.2
		ae (mm)	1.0 (~3)	1.2 (~4)	1.2 (~5)	1.5 (~5)	2.0 (~9)	2.5 (~13)	4.0 (~18)	4.2 (~23)	4.2 (~25)
Heat resistant alloy (INCO718)	JC8015	*n* (min^{-1})	2,920	2,190	1,750	1,460	1,090	880	700	580	550
		Vf (mm/min)	580	440	350	290	220	180	140	120	110
		ap (mm)	0.1	0.15	0.15	0.15	0.15	0.2	0.2	0.2	0.2
		ae (mm)	1.0 (~3)	1.2 (~5)	1.2 (~5)	1.5 (~5)	2.0 (~9)	2.5 (~13)	4.0 (~18)	4.2 (~23)	4.2 (~25)

Note) 1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. These cutting conditions represent stable machining at length 3 x Dc.
Please adjust cutting conditions according to overhang length.
3. In case of chatter ocurring, recommended to reduce ap or feed.
4. Use air blow.

Overhang length	*n* (min^{-1})	*Vf* (mm/min)
~3Dc	100%	100%
3Dc~5Dc	70%	70%
5Dc~10Dc	50%	50%

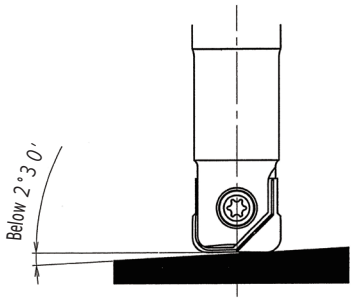
MIRROR RADIUS — HRM Type

■ Recommended Cutting Conditions | HRM type | High Feed / Semi finishing

Material		Tool dia. (mm)									
		Ø6×R1.5		Ø8×R2/Ø9×R2				Ø10×R2/Ø11×R2			
		2.5 D	5.0 D	2.5 D	5.0 D	7.5 D	10 D	2.5 D	5.0 D	7.5 D	10 D
Carbon steel below 250HB	*n* (min^{-1})	9,000	9,000	7,500	7,500	7,500	7,500	6,000	6,000	6,000	6,000
	Vf (mm/min)	8,000	7,200	8,200	6,750	6,750	6,750	7,200	6,000	6,000	6,000
	ap (mm)	0.2	0.15	0.4	0.4	0.25	0.2	0.4	0.4	0.25	0.2
	ae (mm)	2.1	2.1	2.8	2.8	2.8	2.8	4.2	4.2	4.2	4.2
Mold steel 30 - 43HRC	*n* (min^{-1})	8,500	8,500	7,100	7,100	7,100	7,100	5,700	5,700	5,700	5,700
	Vf (mm/min)	7,600	6,800	7,800	6,400	6,400	6,400	6,800	5,700	5,700	5,700
	ap (mm)	0.2	0.15	0.4	0.4	0.25	0.2	0.4	0.4	0.25	0.2
	ae (mm)	2.1	2.1	2.8	2.8	2.8	2.8	4.2	4.2	4.2	4.2
Tool & Die steel below 255HB	*n* (min^{-1})	8,500	8,500	7,100	7,100	7,100	7,100	5,700	5,700	5,700	5,700
	Vf (mm/min)	7,600	6,800	7,800	6,400	6,400	6,400	6,800	5,700	5,700	5,700
	ap (mm)	0.2	0.15	0.4	0.4	0.25	0.2	0.4	0.4	0.25	0.2
	ae (mm)	2.1	2.1	2.8	2.8	2.8	2.8	4.2	4.2	4.2	4.2
Stainless steel below 250HB	*n* (min^{-1})	8,000	8,000	6,700	6,700	6,700	6,700	5,400	5,400	5,400	5,400
	Vf (mm/min)	6,400	5,600	7,300	6,000	6,000	6,000	6,400	5,400	5,400	5,400
	ap (mm)	0.2	0.15	0.4	0.4	0.25	0.2	0.4	0.4	0.25	0.2
	ae (mm)	2.1	2.1	2.8	2.8	2.8	2.8	4.2	4.2	4.2	4.2
Hardened die steel 40 - 50HRC	*n* (min^{-1})	6,900	6,900	6,000	6,000	6,000	6,000	4,700	4,700	4,700	4,700
	Vf (mm/min)	5,500	4,800	6,600	4,800	4,800	4,800	5,600	4,700	4,700	4,700
	ap (mm)	0.15	0.1	0.2	0.2	0.15	0.1	0.2	0.2	0.15	0.1
	ae (mm)	2.1	2.1	2.8	2.8	2.8	2.8	4.2	4.2	4.2	4.2
Grey & Nodular cast iron below 300 HB	*n* (min^{-1})	7,400	7,400	6,400	6,400	6,400	6,400	5,100	5,100	5,100	5,100
	Vf (mm/min)	6,600	5,900	7,600	5,700	5,700	5,700	6,100	5,100	5,100	5,100
	ap (mm)	0.2	0.15	0.4	0.4	0.25	0.2	0.4	0.4	0.25	0.2
	ae (mm)	2.1	2.1	2.8	2.8	2.8	2.8	4.2	4.2	4.2	4.2

ap adjustment by corner radius ap × ratio	Tool dia. (mm)	∂p (mm)
	Ø6×R0.5	65%
	Ø6×R1.0	80%
	Ø6×R1.5	100%

Note) 1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. In case of chatter ocurring, recommended to reduce ap or Vf.
3. Recommended to reduce the parameteres when using on low horse power machine.
4. Use air blow.
5. Reduce ap, n & Vf by 30% in case of cutting material 50-55HRC.
6. Reduce Vf for better surface finish.
7. Use angle 2°30'or below in case of ramping (see right figure).
8. In case of slotting with over 5xDc, reduce Vf or ap appropriately.



★ Insert Mounting Information

1. Make sure the insert seat on body is carefully cleaned.
2. Make sure insert itself is clean, especially the hole and face location.
3. Change insert screw when threads starts to wear.
4. Do not over tighten screw. See table for torque specifications.

Toll dia. (mm) φDc	Torque N·m
6	0.5
8	0.9
10	1.2
12	2.0
16	3.0
20	4.0

MIRROR RADIUS HRM Type

■ Recommended Cutting Conditions | HRM type | High Feed / Semi finishing

	Tool dia. (mm)											
	Ø12×R2/Ø13×R2				Ø16×R3/Ø17×R3				Ø20×R3/Ø22×R3			
	2.5 D	5.0 D	7.5 D	10 D	2.5 D	5.0 D	7.5 D	10 D	2.5 D	5.0 D	7.5 D	10 D
n **(min^{-1})**	5,000	5,000	5,000	5,000	3,800	3,800	3,800	3,800	3,000	3,000	3,000	3,000
Vf **(mm/min)**	6,000	5,000	5,000	5,000	4,500	3,800	3,800	3,800	3,600	3,000	3,000	3,000
ap (mm)	0.5	0.4	0.25	0.2	0.6	0.6	0.4	0.3	0.6	0.6	0.4	0.3
ae (mm)	5.6	5.6	5.6	5.6	7	7	7	7	9.8	9.8	9.8	9.8
n **(min^{-1})**	4,700	4,700	4,700	4,700	3,500	3,500	3,500	3,500	2,800	2,800	2,800	2,800
Vf **(mm/min)**	5,600	4,700	4,700	4,700	4,200	3,500	3,500	3,500	3,300	2,800	2,800	2,800
ap (mm)	0.4	0.4	0.25	0.2	0.6	0.6	0.4	0.3	0.6	0.6	0.4	0.3
ae (mm)	5.6	5.6	5.6	5.6	7	7	7	7	9.8	9.8	9.8	9.8
n **(min^{-1})**	4,700	4,700	4,700	4,700	3,500	3,500	3,500	3,500	2,800	2,800	2,800	2,800
Vf **(mm/min)**	5,600	4,700	4,700	4,700	4,200	3,500	3,500	3,500	3,300	2,800	2,800	2,800
ap (mm)	0.4	0.4	0.25	0.2	0.6	0.6	0.4	0.3	0.6	0.6	0.4	0.3
ae (mm)	5.6	5.6	5.6	5.6	7	7	7	7	9.8	9.8	9.8	9.8
n **(min^{-1})**	4,500	4,500	4,500	4,500	3,400	3,400	3,400	3,400	2,700	2,700	2,700	2,700
Vf **(mm/min)**	5,400	4,500	4,500	4,500	4,000	3,400	3,400	3,400	3,200	2,700	2,700	2,700
ap (mm)	0.4	0.4	0.25	0.2	0.6	0.6	0.4	0.3	0.6	0.6	0.4	0.3
ae (mm)	5.6	5.6	5.6	5.6	7	7	7	7	9.8	9.8	9.8	9.8
n **(min^{-1})**	4,000	4,000	4,000	4,000	3,000	3,000	3,000	3,000	2,400	2,400	2,400	2,400
Vf **(mm/min)**	4,800	4,000	4,000	4,000	3,600	3,000	3,000	3,000	2,800	2,400	2,400	2,400
ap (mm)	0.2	0.2	0.15	0.1	0.3	0.3	0.25	0.2	0.3	0.3	0.25	0.2
ae (mm)	5.6	5.6	5.6	5.6	7	7	7	7	9.8	9.8	9.8	9.8
n **(min^{-1})**	4,200	4,200	4,200	4,200	3,200	3,200	3,200	3,200	2,500	2,500	2,500	2,500
Vf **(mm/min)**	5,000	4,200	4,200	4,200	3,800	3,200	3,200	3,200	3,000	2,500	2,500	2,500
ap (mm)	0.4	0.4	0.25	0.2	0.6	0.6	0.4	0.3	0.6	0.6	0.4	0.3
ae (mm)	5.6	5.6	5.6	5.6	7	7	7	7	9.8	9.8	9.8	9.8

ap adjustment by corner radius ap × ratio	Tool dia. (mm)	ap (mm)	Tool dia. (mm)	ap (mm)
	Ø16×R2.0	75%	Ø20×R2.0	75%
	Ø16×R3.0	100%	Ø20×R3.0	100%

DIEMASTER 5G

Feature 1 Multiple Machining Styles



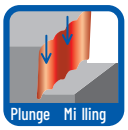
- Side Wall Finishing



- Bottom Finishing



- Semi-Finishing



- Plunge Finishing & Semi-Finishing

Feature 2 Available in 2 insert grades

JC8015 **P** **M** **K**

For general purpose

Applied to general steel, mold steel, stainless steel, and hardened die steel up to 50 HRC

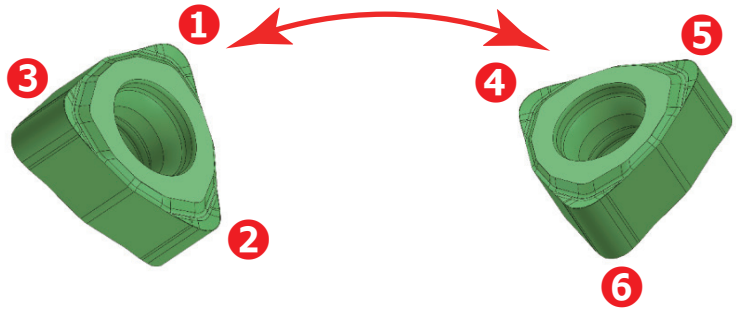
DH103 **P** **K** **H**

For hardened steel

Excellent wear-resistance when finishing or semi-finishing high hardened steels

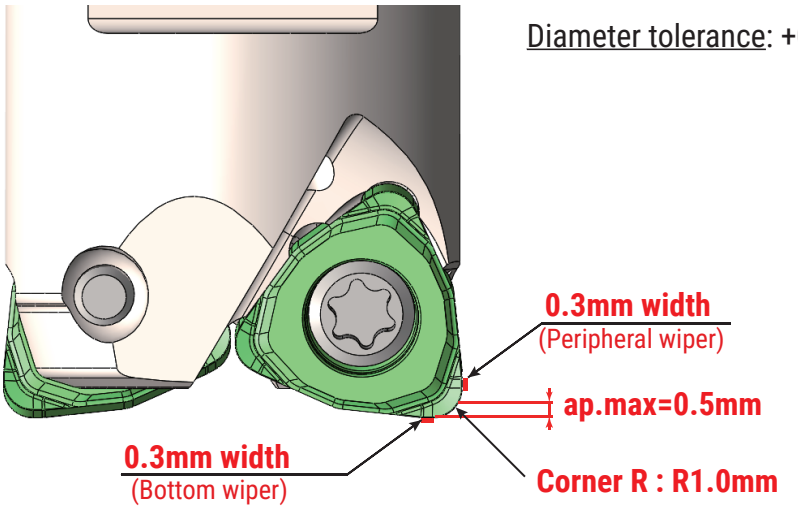
ISO	P					M					K				H		
	P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30	H01	H10	H20
Application Range		JC8015					JC8015						JC8015				
	DH103										DH103				DH103		

Feature 3 Economical double-sided insert (with 6 cutting edges) High accuracy with H-class tolerance



Feature 4 **Double-wiper insert**

Wiper for face cutting and for periphery cutting



Diameter tolerance: +0.01/-0.05

■ Selection Guide

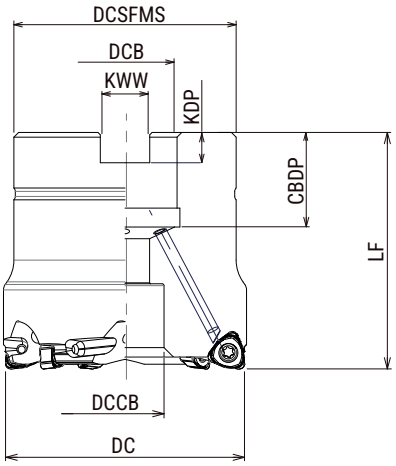
Product	Mirror Radius MRX / RNM type	High Precision QM max MQT-A00 type	**Diemaster 5G XFG / MXF type**
			
Tool diameter (mm)	6 - 32	16 - 35	16 - 66
Diameter tolerance	0 / -0.02	0 / -0.03	+0.01 / -0.05
Accuracy	★★★	★★	★
Efficiency	★	★★★	★★
Economical	★	★★	★★★

DIEMASTER 5G

Through coolant hole | Face Milling | Copy Milling | Shoulder Milling | Plunge Milling

XFG TYPE Bore Type





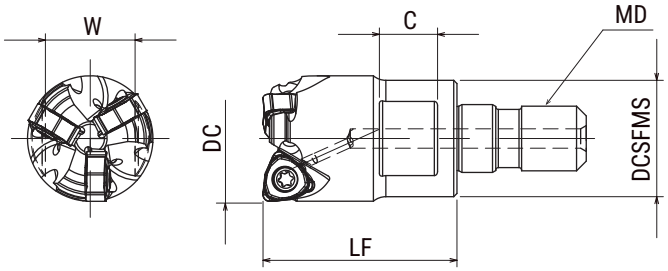
Cat.No.	Stock	No. of inserts	Dimensions (mm)								Arbor set bolt	Weight (kg)	Inserts
			DC	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP			
XFG-6050R-22	●	6	50	50	47	22	16.5	10.4	6.3	20	M10	0.54	WNHU04T310ZER
XFG-6052R-22	●	6	52	50	47	22	16.5	10.4	6.3	20	M10	0.56	
XFG-7063R-27	●	7	63	50	48	27	20.0	12.4	7	22	M12×1.75×30★	0.69	
XFG-7066R-27	●	7	66	50	48	27	20.0	12.4	7	22	M12×1.75×30★	0.72	

Screw	Torque(N.m)	Wrench
TSW-2567H	1.1	A-08

Through coolant hole | Face Milling | Copy Milling | Shoulder Milling | Plunge Milling

MXF TYPE Modular Type



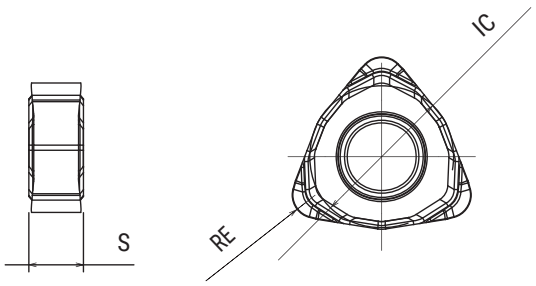


Cat.No.	Stock	No. of inserts	Dimensions (mm)						Insert
			DC	LF	DCSFMS	MD	C	W	
MXF-2016-M8	●	2	16	23	14	M8	8	12	WNHU04T310ZER
MXF-3020-M10	●	3	20	30	18	M10	9	14	
MXF-4025-M12	●	4	25	35	22	M12	11	19	
MXF-5032-M16	●	5	32	43	29	M16	12	22	
MXF-5035-M16	●	5	35	43	29	M16	12	22	
MXF-6040-M16	●	6	40	43	32	M16	14	26	
MXF-6042-M16	●	6	42	43	32	M16	14	26	

Screw	Torque(N.m)	Wrench
TSW-2567H	1.1	A-08

Insert





Cat.No.	Tolerance	PVD coated		Dimensions (mm)		
		DH103	JC8015	RE	IC	S
WNHU04T310ZER	H	●	●	1.0	6.35	3.33

DIEMASTER 5G

● Attention

⚠ Attention to mounting head and MSN/ MGN shank arbor.

■ Tightening procedure

❶ Cleaning
Remove dirt and chips with air from the connecting thread and face of modular head and MSN/MGN shank arbor .

❷ Initial Tightening
Tighten by hand until the head and the shank arbor faces touch.

❸ Final Tightening
Tighten slowly with torque control spanner wrench or DIJET DS type spanner wrench and confirm that there is no gap.

Attention: Final tightening without initial tightening cause connecting thread damage.

⚠ NOTE

Note: 1. Please gently apply pressure on wrench.
2. Please confirm that there is no gap between MSN/MGN shank arbor and modular

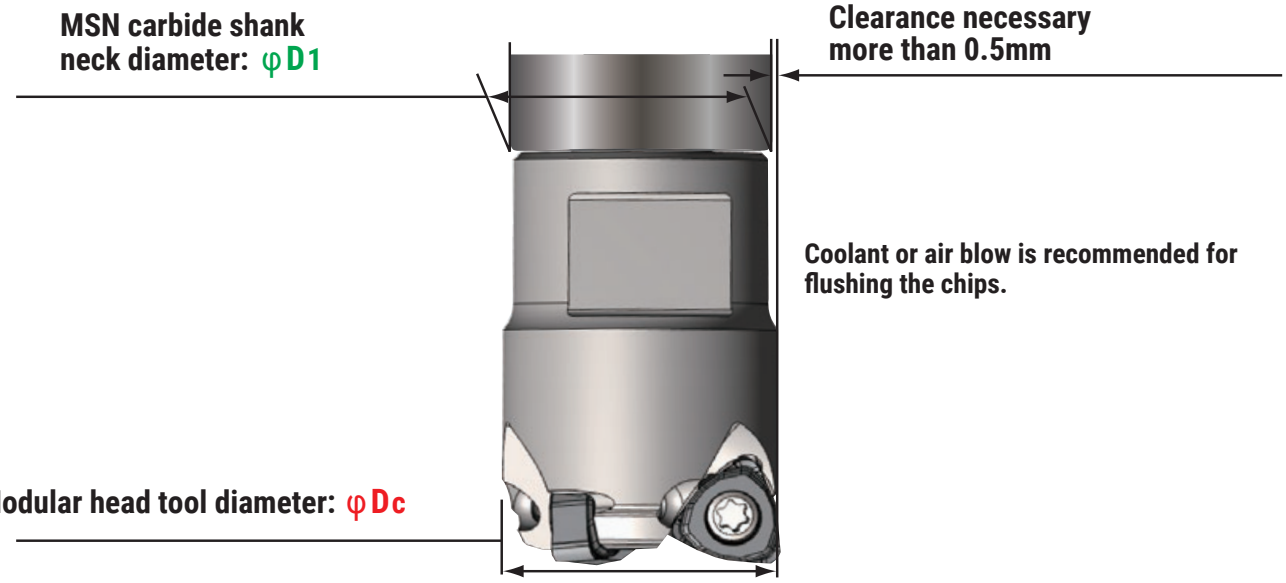
Thread	Tightening torque	Spanner size W (mm)
M8	16N・m	12☆
M10	16N・m	14, 15
M12	20N・m	17, 19
M16	25N・m	22, 26

Note: 1. Modular heads are supplied without spanner wrench.
2. In case of choosing torque control spanner wrench, confirm that the wrench size is match to the dimensions W & C of each modular head. (There are some cases that modifying the thickness of spanner wrench is necessary)
3. ☆ mark shows: DIJET have a stock of DS-8 and 12 type spanner wrenches.

⚠ Selection of "MSN Carbide shank arbor"

In case of using modular head over φ16mm, please select MSN carbide shank arbor that diameter (φD1) is 1mm or more smaller than modular head (φDc).
A wrong selection causes damage to the carbide shank.

$$\varphi Dc - \varphi D1 \geqq 1mm$$



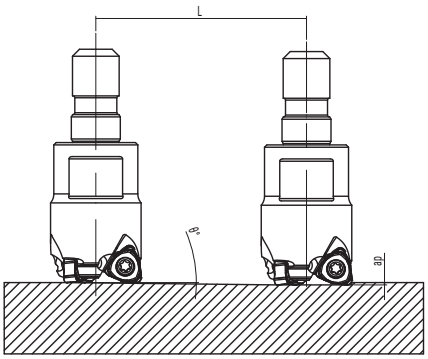
⚠ Caution for the mounting to shrink fit holder.

When you use a carbide shank and a modular head on the shrink fit holder, please shrink fit the only the carbide shank without modular head. Please mount a modular head after cooling off.

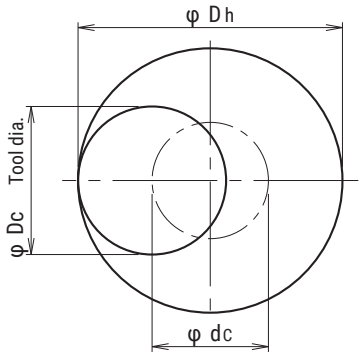
Note: In case of shrink fit MSN shank + modular head together, it will be difficult to loose due to heat desipation.

Attention for profile milling

Ramping



Helical interpolation



◎ In case of ramping and helical interpolation, apply 80% or less feed speed from standard cutting condition table.

◎ In case of helical interpolation, recommend wet cutting by coolant through the tool.

● **Calculation of tool pass dia.**

$$\varphi dc = \varphi Dh - \varphi Dc$$

Tool pass dia. Bore dia. Tool dia.

● Depth of cut per one circuit should not exceed max. depth of cut ap

● Down cutting is recommended, so tool pass rotation should be counterclockwise.

● To obtain a flat bottom surface when helical milling, it requires to remove "the uncut part" in the center of work materials at final pass.

Cat.No.	Tool dia.	Max. Depth of cut (mm) ap	Ramping		Helical interpolation		
			Max. ramping angle θ°	Total cutting length at Max.ap L (mm)	Through hole Min. bore dia. Dh min (mm)	Through hole Max. bore dia.φDh max (mm)	Flat bottom Min.bore dia. Df min (mm)
MXF-2016-M8	16	0.5	0.4	72	28.2	31	29.6
MXF-3020-M10	20	0.5	0.3	95	36.2	39	37.6
MXF-4025-M12	25	0.5	0.2	143	46.2	49	47.6
MXF-5032-M16	32	0.5	0.15	191	60.2	63	61.6
MXF-5035-M16	35	0.5	0.15	191	66.2	69	67.6
MXF-6040-M16	40	0.5	0.1	286	76.2	79	77.6
MXF-6042-M16	42	0.5	0.1	286	80.2	83	81.6
XFG-6050R-22	50	0.5	0.1	286	96.2	99	97.6
XFG-6052R-22	52	0.5	0.1	286	100.2	103	101.6
XFG-7063R-27	63	0.5	※Ramping & helical interpolation is not recommended.				
XFG-7066R-27	66	0.5					

※Drilling is not recommended.

DIEMASTER 5G

■ Recommended Cutting Conditions

Material	Grade		Finishing		Semi Finishing
			Side Wall	Bottom Face	
Carbon steel below 250HB	JC8015	Vc(mm/min)	300	260	190
		fz(mm/t)	0.20	0.20	0.4 - 0.6
		ap(mm)	0.30	0.20	0.20
		ae(mm)	0.10	~ 0.7 Dc	0.5Dc
Cast steel below 285HB	JC8015	Vc(mm/min)	300	260	190
		fz(mm/t)	0.20	0.20	0.4 - 0.6
		ap(mm)	0.30	0.20	0.20
		ae(mm)	0.10	~ 0.7 Dc	0.5Dc
Tool & die steel below 255HB	JC8015	Vc(mm/min)	300	260	175
		fz(mm/t)	0.20	0.20	0.4 - 0.6
		ap(mm)	0.30	0.20	0.20
		ae(mm)	0.10	~ 0.7 Dc	0.5Dc
Mold steel 30-36 HRC	DH103 JC8015	Vc(mm/min)	300	260	175
		fz(mm/t)	0.20	0.20	0.4 - 0.6
		ap(mm)	0.30	0.20	0.20
		ae(mm)	0.10	~ 0.7 Dc	0.5Dc
Mold steel 38-43HRC	DH103 JC8015	Vc(mm/min)	280	240	160
		fz(mm/t)	0.15	0.15	0.4 - 0.6
		ap(mm)	0.30	0.20	0.20
		ae(mm)	0.10	~ 0.7 Dc	0.5Dc
Hardened die steel 42-52HRC	DH103 JC8015	Vc(mm/min)	250	190	150
		fz(mm/t)	0.08	0.08	0.4 - 0.6
		ap(mm)	0.30	0.15	0.20
		ae(mm)	0.10	~ 0.7 Dc	0.5Dc
Grey cast iron 160-260HB	DH103 JC8015	Vc(mm/min)	350	300	160
		fz(mm/t)	0.25	0.20	0.4 - 0.6
		ap(mm)	0.30	0.20	0.20
		ae(mm)	0.20	~ 0.7 Dc	0.5Dc
Nodular cast iron 170-300HB	DH103 JC8015	Vc(mm/min)	350	300	160
		fz(mm/t)	0.25	0.20	0.4 - 0.6
		ap(mm)	0.30	0.20	0.20
		ae(mm)	0.20	~ 0.7 Dc	0.5Dc
Stainless steel	JC8015	Vc(mm/min)	280	240	170
		fz(mm/t)	0.20	0.20	0.4 - 0.6
		ap(mm)	0.30	0.15	0.20
		ae(mm)	0.10	~ 0.7 Dc	0.5Dc
Titanium alloy Ti-6Al-4V 35-43HRC	JC8015	Vc(mm/min)	100	55	-
		fz(mm/t)	0.12	0.10	-
		ap(mm)	0.25 - 0.30	0.20	-
		ae(mm)	0.10	~ 0.7 Dc	-
Heat resistant alloy INCO718 35-43HRC	JC8015	Vc(mm/min)	80	55	-
		fz(mm/t)	0.12	0.10	-
		ap(mm)	0.25 - 0.30	0.20	-
		ae(mm)	0.10	~ 0.7 Dc	-

Vc : Cutting speed fz : Feed rate per tooth ap : Depth of cut ae : Width of cut

Note

1. The above cutting conditions should be adjusted according to the machine rigidity and workpiece rigidity.
2. The above cutting conditions are for a overhang length of 3Dc.
   Adjust the rotation speed n (min-1) and feed rate Vf (mm/min) according to the protrusion length.
3. If chattering occurs, reduce the depth of cut to a shallower depth than the above values or lower the feed rate.
4. Remove chips by air blow. Be especially careful when machining cavities with a vertical MC.
5. When using a steel shank, reduce the rotation speed n (min-1) and feed rate Vf (mm/min) to 80% of the above conditions.

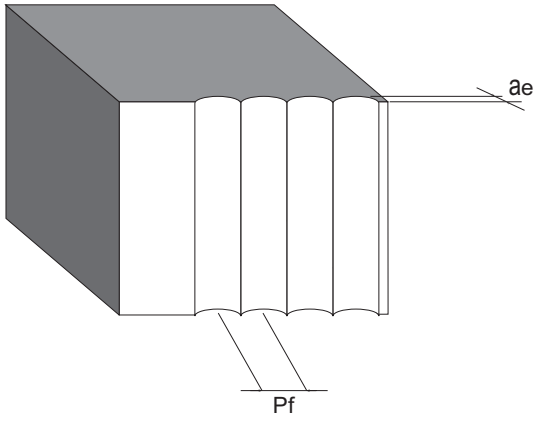
■ Recommended Cutting Conditions

Material	Grade		Plunging	
			Finishing	Semi Finishing
Carbon steel below 250HB	JC8015	Vc(mm/min)	400	300
		fz(mm/t)	0.10	0.15
		ae(mm)	~0.2	~2
		Pf(mm)	-	~0.15Dc
Cast steel below 285HB	JC8015	Vc(mm/min)	400	300
		fz(mm/t)	0.10	0.15
		ae(mm)	~0.2	~2
		Pf(mm)	-	~0.15Dc
Tool & die steel below 255HB	JC8015	Vc(mm/min)	350	260
		fz(mm/t)	0.10	0.15
		ae(mm)	~0.2	~2
		Pf(mm)	-	~0.15Dc
Mold steel 30-36 HRC	DH103 JC8015	Vc(mm/min)	300	220
		fz(mm/t)	0.10	0.12
		ae(mm)	~0.2	~2
		Pf(mm)	-	~0.15Dc
Mold steel 38-43HRC	DH103 JC8015	Vc(mm/min)	200	150
		fz(mm/t)	0.10	0.12
		ae(mm)	~0.2	~2
		Pf(mm)	-	~0.15Dc
Hardened die steel 42-52HRC	DH103 JC8015	Vc(mm/min)	140	100
		fz(mm/t)	0.07	0.10
		ae(mm)	~0.2	~2
		Pf(mm)	-	~0.15Dc
Grey cast iron 160-260HB	DH103 JC8015	Vc(mm/min)	500	370
		fz(mm/t)	0.10	0.15
		ae(mm)	~0.2	~2
		Pf(mm)	-	~0.15Dc
Nodular cast iron 170-300HB	DH103 JC8015	Vc(mm/min)	500	370
		fz(mm/t)	0.10	0.15
		ae(mm)	~0.2	~2
		Pf(mm)	-	~0.15Dc

Vc : Cutting speed fz : Feed rate per tooth ae : Width of cut Pf : Pick Feed

Note

1. The above cutting conditions should be adjusted according to the machine rigidity and workpiece rigidity.
2. The above cutting conditions are for a overhang length of 3Dc.
   Adjust the rotation speed n (min-1) and feed rate Vf (mm/min) according to the protrusion length.
3. If chattering occurs, reduce the depth of cut to a shallower depth than the above values or lower the feed rate.
4. Remove chips by air blow. Be especially careful when machining cavities with a vertical MC.
5. When using a steel shank, reduce the rotation speed n (min-1) and feed rate Vf (mm/min) to 80% of the above conditions.

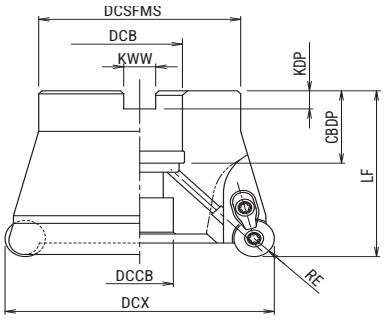


SUPER DIEMASTER HDM/SDH Type

Through coolant hole | Face Milling | Copy Milling | Pocket Milling | Helical Interpolation

HDM TYPE Bore Type / Standard Pitch

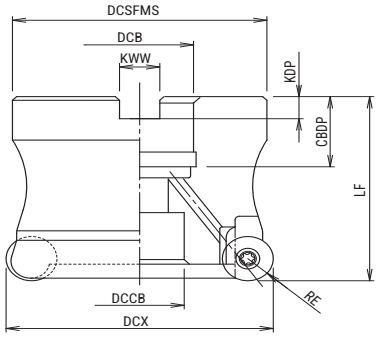




Cat.No.	Stock	No. of inserts	Dimensions(mm)									Arbor set bolt	Parts		Weight (kg)	Inserts
			DCX	RE	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP		Screw	Wrench		
HDM-3050-12R-22	●	3	50	6	50	47	22	16.5	10.4	6.3	20	M10	DSW-410H	A-15T	0.5	RD**1204MO...
HDM-4063-16R-22	●	4	63	8	50	60	22	16.5	10.4	6.3	20	M10	DSW-4512H	A-20	0.7	RD**1606MO...

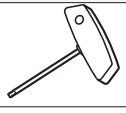
HDM TYPE Bore Type / Fine Pitch





Cat.No.	Stock	No. of inserts	Dimensions(mm)									Arbor set bolt	Weight (kg)	Parts		Inserts
			DCX	RE	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP			Screw	Wrench	
HDM-4050-16R-22	●	4	50	8	55	47	22	16.5	10.4	6.3	20	M10	0.4	DSW-4512H	A-20	RD**1606MO...
HDM-5050-12R-22	●	5	50	6	50	47	22	16.5	10.4	6.3	20	M10	0.4	DSW-410H	A-15T	RD**1204MO...
HDM-5052-12R-22	●	5	52	6	50	40	22	16.5	10.4	6.3	20	M10	0.5	DSW-410H	A-15T	RD**1204MO...
HDM-5063-16R-27	●	5	63	8	50	60	27	20	12.4	7	22	M12	0.7	DSW-4512H	A-20	RD**1606MO...
HDM-6063-12R-27	●	6	63	6	50	60	27	20	12.4	7	22	M12	0.8	DSW-410H	A-15T	RD**1204MO...
HDM-6080-16R-27	●	6	80	8	55	76	27	20	12.4	7	22	M12	1.3	DSW-4512H	A-20	RD**1606MO...
HDM-7080-12R-27	●	7	80	6	55	76	27	20	12.4	7	22	M12	1.4	DSW-410H	A-15T	RD**1204MO...

MD	Hexagonal wrench(mm) for Arbor set bolt
M10	8
M12	10
M16	14
M20	17
M24	19

Inserts	Screw	Clamp	Wrench
			
RD**1204MO*	DSW-410H	DCM-18	A-15T
RD**1606MO*	DSW-4512H	DCM-17	A-20

Through coolant hole | Face Milling | Copy Milling | Pocket Milling | Helical Interpolation

SDH TYPE Modular Type / Standard Pitch

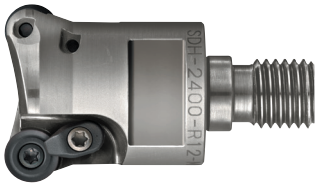


Fig.1

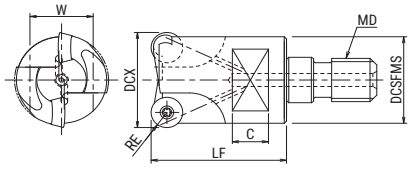
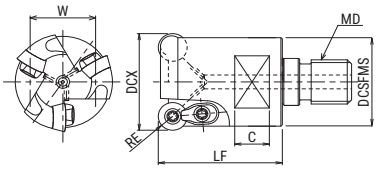


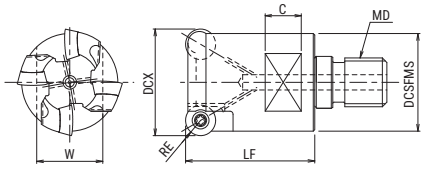
Fig.2



Cat.No.	Stock	No. of inserts	Dimensions(mm)							Parts			Inserts	Fig.
			DCX	RE	LF	DCSFMS	MD	C	W	Screw	Clamp	Wrench		
SDH-2150-R07-M8	●	2	15	3.5	23	13.8	M8	8	12	TSW-2556H	–	A-08SD	RD**07T2MO...	1
SDH-2160-R07-M8	●	2	16	3.5	23	15	M8	8	12					
SDH-2200-R07-M10	●	2	20	3.5	30	18	M10	8	14					
SDH-2250-R10-M12	●	2	25	5	35	23	M12	10	17	CSW-408H	DCM-18	A-15	RD**1004MO...	2
SDH-2280-R10-M12	○	2	28	5	35	25	M12	10	17					
SDH-2320-R12-M16	●	2	32	6	43	28	M16	12	22	DSW-410H			RD**1204MO...	
SDH-3320-R10-M16	●	3	32	5	43	28	M16	12	22	CSW-408H			RD**1004MO...	
SDH-2350-R12-M16	○	2	35	6	43	32	M16	12	22	DSW-410H			RD**1204MO...	
SDH-3350-R10-M16	○	3	35	5	43	32	M16	12	22	CSW-408H			RD**1004MO...	
SDH-2400-R12-M16	○	2	40	6	43	32	M16	13	26	DSW-410H			RD**1204MO...	

SDH TYPE Modular Type / Fine Pitch





Screw	Torque (N.m)
TSW-2556H	1.1
CSW-408H	3.6
DSW-410H	3.6

Cat.No.	Stock	No. of inserts	Dimensions(mm)							Parts		Inserts
			DCX	RE	LF	DCSFMS	MD	C	W	Screw	Wrench	
SDH-3200-R07-M10	●	3	20	3.5	30	18	M10	8	14	TSW-2556H	A-08SD	RD**07T2MO...
SDH-3220-R07-M10	○	3	22	3.5	30	20	M10	8	14			
SDH-3250-R07-M12	○	3	25	3.5	35	23	M12	10	17			
SDH-3250-R10-M12	●	3	25	5	35	23	M12	10	17	CSW-408H	A-15	RD**1004MO...
SDH-3280-R10-M12	○	3	28	5	35	25	M12	10	17			
SDH-3300-R10-M16	○	3	30	5	43	28	M16	12	22			
SDH-4300-R10-M16	●	4	30	5	43	28	M16	12	22			
SDH-4320-R10-M16	●	4	32	5	43	28	M16	12	22			
SDH-3350-R12-M16	●	3	35	6	43	32	M16	12	22	DSW-410H		RD**1204MO...
SDH-4350-R10-M16	●	4	35	5	43	32	M16	12	22	CSW-408H		RD**1004MO...
SDH-4400-R12-M16	●	4	40	6	43	32	M16	13	26	DSW-410H		RD**1204MO...
SDH-5420-R10-M16	●	5	42	5	43	32	M16	13	26	CSW-408H		RD**1004MO...

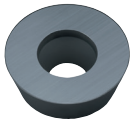
SUPER DIEMASTER HDM/SDH Type

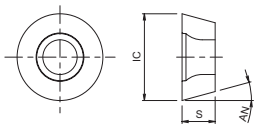
Insert

Standard type

Flat top inert

for General steel





Cat.No.	Tolerance	PVD Coating			Dimensions(mm)		
		DH103	JC5040	JC8015	IC	S	AN
RDMW07T2MOT	M	●	●	●	7	2.7	15°
RDMW1004MOT		●	●	●	10	4.1	
RDMW1204MOT		●	●	●	12	4.8	
RDMW1606MOT		●	●	●	16	6	

Low cutting force

Chip breaker style

for Titanium・Inconel

for Stainless steel



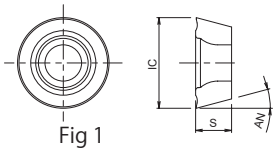


Fig 1



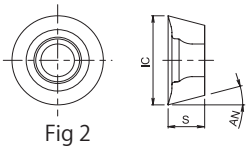


Fig 2

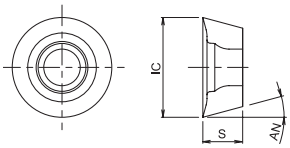
Cat.No.	Tolerance	PVD Coating			Dimensions(mm)			Fig.
		JC8015	JC8050	JC8118	IC	S	AN	
RDGT07T2MOE	G	●	●		7	2.7	15°	1
RDGT1004MOE		●	●		10	4.1		
RDGT1004MOT		●	●					
RDGT1204MOE		●	●		12	4.8		
RDGT1204MOT		●	●					
RDGT1606MOE		●	●		16	6		
RDGT1606MOT		●	●					
RDMT07T2MOE	M		●	○	7	2.7		
RDMT1004MOE			●	●	10	4.1		
RDMT1004MOE-ML			●					2
RDMT1004MOT			●	●				1
RDMT1204MOE			●	●	12	4.8		
RDMT1204MOE-ML			●					2
RDMT1204MOT			●	●				1
RDMT1606MOE			●	●	16	6		
RDMT1606MOT			●	●				

Low cutting force

Chip breaker style

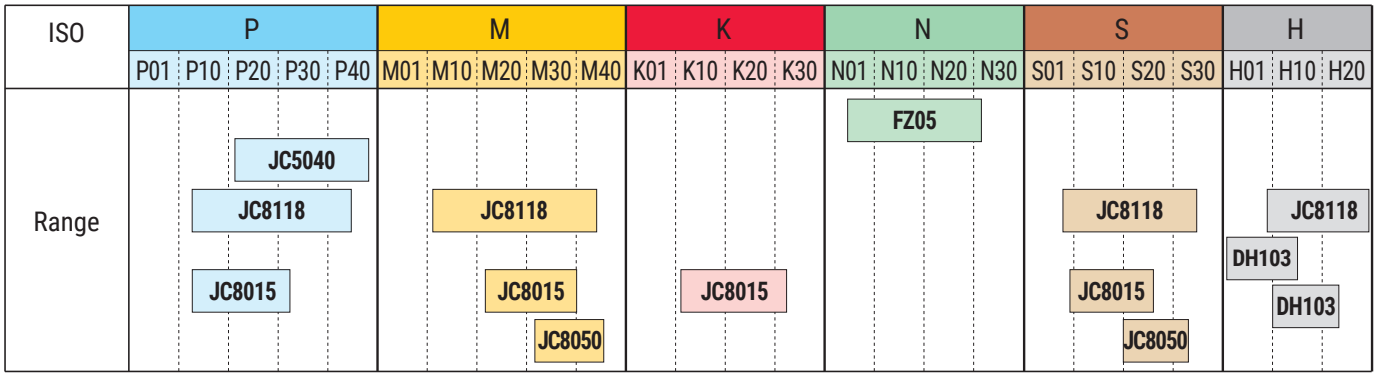
for Aluminium





Cat.No.	Tolerance	Uncoated	Dimensions(mm)		
		FZ05	IC	S	AN
RDGT07T2MOF-AL	G	●	7	2.7	15°
RDGT1004MOF-AL		●	10	4.1	
RDGT1204MOF-AL		●	12	4.8	
RDGT1606MOF-AL		●	16	6	

■ Insert grades



■ Grade selection guide

Material	Cast iron	Carbon steel・Tool steell			Mold steel		Hardened steel	Titanium alloy Inconel		Stainless steel		Aluminium
Grade / Cat.No.	JC8015 JC5118	JC5040	JC8118	JC8050	JC8015 JC8118	JC8050	DH103 (over 50HRC) JC8015 JC8118	JC8015 JC8118	JC8050	JC8015 JC8118	JC8050	FZ05
RDMW07T2MOT	◎	◎	○		◎		◎	○		○		
RD＊T07T2MOE	☆		☆	●	☆	●		◎	●	◎	●	
RDMW1004MOT	◎	◎	○		◎		◎					
RD＊T1004MOT	☆				○					○	●	
RD＊T1004MOE			☆	●	☆	●		○	●	☆		
RDMT1004MOE-ML									◎		◎	
RDMW1204MOT	◎	◎	○		◎		◎					
RD＊T1204MOT	☆				○					○	●	
RD＊T1204MOE			☆	●	☆	●		○	●	☆		
RDMT1204MOE-ML									◎		◎	
RDMW1606MOT	◎	◎	○		◎		◎					
RD＊T1606MOT	☆				○					○	●	
RD＊T1606MOE			☆	●	☆	●		○	◎	☆	◎	
RDGT**MOF-AL**												◎

■ Grade selection guide

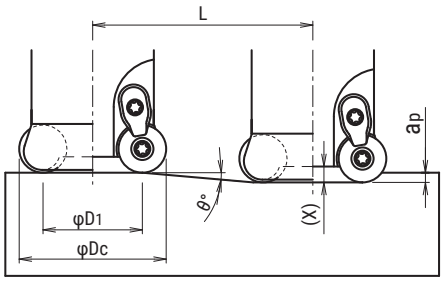
Material	Cast iron	Carbon steel Tool steell	Mold steel	Hardened steel	Stainless steel	Aluminium
Cat.No./Grade	DH103	JC8015	JC8015	DH103	JC8015	FZ05
RDMW**MOT**	◎	◎	◎	◎	◎	
RDGT**MOF-AL**						◎

・RDMW type : without chip breaker ・RD*T type : with chip breaker

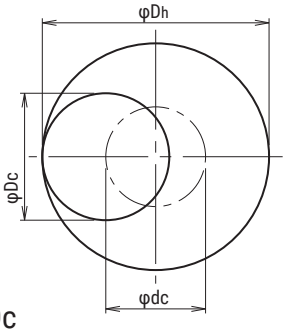
◎：First choice ○：General cutting ●：Unstable cutting ☆：Light cutting

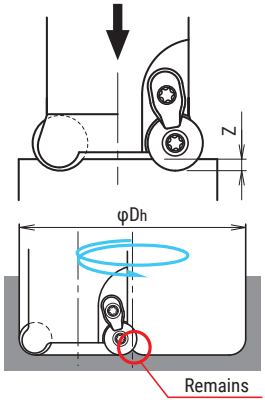
■ Recommended Data for Profile Milling

● Ramping



● Helical interpolation





● Calculation of tool pass dia. $\varphi dc = \varphi Dh - \varphi Dc$

Tool pass dia. Bore dia. Tool dia.

● Depth of cut per one circuit should not exceed max. depth of cut Ap.

● Down cutting is recommended, tool pass rotation should be counterclockwise

● Do not combine drilling and ramping together

● In case of ramping and helical interpolation, apply 70% or less feed (Vf) from standard cutting condition table.

● In case of drilling , apply 50% or less feed (Vf) from standard cutting condition table.

● Long chips may come out in case of drilling, confirm safe operating conditions.

Tool dia. (mm)	Insert dia. (R) (mm)	Effective cutting dia. φD1 (mm)	Min. Bore dia. Dh min (mm)	Max. Bore dia. Dh max (mm)	Max. ramping angle: θ	Max.depth of cut: ap (mm)	Max.depth of cut (ap) Total cutting lenugh: L (mm)	Max. drilling lengh: Z (mm)	Depth of holder face: X (mm)
15	7 (R3.5)	8	20	28	3°00'	3.5	66.8	0.4	1.0
16	7 (R3.5)	9	22	30	9°00'	3.5	22.1	1.5	2.5
20	7 (R3.5)	13	30	38	5°30'	3.5	36.3	1.5	2.5
22	7 (R3.5)	15	34	42	4°35'	3.5	43.6	1.5	2.5
25	7 (R3.5)	18	40	48	3°40'	3.5	54.6	1.5	2.5
25	10 (R5)	15	34	48	10°45'	5.0	26.3	2.5	3.5
28	10 (R5)	18	40	54	8°20'	5.0	34.1	2.5	3.5
30	10 (R5)	20	44	58	7°15'	5.0	39.3	2.5	3.5
32	10 (R5)	22	48	62	6°25'	5.0	44.4	2.5	3.5
32	12 (R6)	20	44	62	7°35'	6.0	45.1	2.5	3.5
35	10 (R5)	25	54	68	5°30'	5.0	51.9	2.5	3.5
35	12 (R6)	23	50	68	6°15'	6.0	54.7	2.5	3.5
40	12 (R6)	28	60	78	4°55'	6.0	69.7	2.5	3.5
42	10 (R5)	32	68	82	4°05'	5.0	70.0	2.5	3.5
50	12 (R6)	38	80	98	5°15'	6.0	65.2	3.5	4.5
50	16 (R8)	34	75	98	7°25'	8.0	61.4	4.0	5.0
52	12 (R6)	40	84	102	4°55'	6.0	69.7	3.5	4.5
52	16 (R8)	36	79	102	6°55'	8.0	65.9	4.0	5.0
63	12 (R6)	51	106	124	3°45'	6.0	91.5	3.5	4.5
63	16 (R8)	47	101	124	5°00'	8.0	91.4	4.0	5.0
66	12 (R6)	54	112	130	3°30'	6.0	98.1	3.5	4.5
66	16 (R8)	50	107	130	4°40'	8.0	98.0	4.0	5.0
80	12 (R6)	68	140	158	2°45'	6.0	124.9	3.5	4.5
80	16 (R8)	64	135	158	3°30'	8.0	130.7	4.0	5.0
100	16 (R8)	84	175	198	2°35'	8.0	177.3	4.0	5.0
125	16 (R8)	109	225	248	1°55'	8.0	239.1	4.0	5.0
160	16 (R8)	144	295	318	1°25'	8.0	223.5	4.0	5.0

■Recommended Cutting Conditions

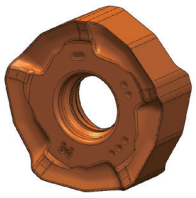
Material	Grade	Vc	Parameters	Insert Type			
				RD**07	RD**10	RD**12	RD**16
Carbon Steel below 250HB	JC8050 JC5040 JC8118	170 - 220	fz	~0.25	~0.30	~0.35	~0.37
			ap	~1.5	~2.0	~2.5	~4.0
			ae	0.7 Dc	0.7 Dc	0.7 Dc	0.7 Dc
Mold Steel 30-43HRC	JC8050 JC8118 JC8015	160 - 190	fz	~0.25	~0.29	~0.33	~0.34
			ap	~1.5	~2.0	~2.5	~3.5
			ae	0.6 Dc	0.6 Dc	0.6 Dc	0.6 Dc
Tool & Die Steel below 255HB	JC5040 JC8118	160 - 190	fz	~0.25	~0.30	~0.35	~0.37
			ap	~1.5	~2.0	~2.5	~4.0
			ae	0.7 Dc	0.7 Dc	0.7 Dc	0.7 Dc
Stainless Steel	JC8050 JC8015 JC8118	135 - 160	fz	~0.25	~0.26	~0.28	~0.32
			ap	~1.5	~2.0	~2.5	~4.0
			ae	0.6 Dc	0.6 Dc	0.6 Dc	0.6 Dc
Hardened Die Steel 40-50HRC	JC8015 DH103	120 - 140	fz	~0.20	~0.25	~0.25	~0.25
			ap	~0.8	~1.5	~1.5	~2.0
			ae	0.4 Dc	0.4 Dc	0.4 Dc	0.4 Dc
Grey & Nodular Cast Iron	JC8015 JC8118	170 - 220	fz	~0.25	~0.30	~0.35	~0.40
			ap	~1.5	~2.0	~2.5	~4.0
			ae	0.7 Dc	0.7 Dc	0.7 Dc	0.7 Dc
Titanium Alloy	JC8050 JC8015 JC8118	65	fz	~0.25	~0.25	~0.25	~0.25
			ap	~0.5	~0.5	~1.0	~1.5
			ae	0.6 Dc	0.6 Dc	0.6 Dc	0.6 Dc
Heat Resistant Alloy	JC8015 JC8118 JC8050	30	fz	~0.2	~0.2	~0.2	~0.25
			ap	~0.5	~0.5	~1.0	~1.5
			ae	0.6 Dc	0.6 Dc	0.6 Dc	0.6 Dc
Aluminium	FZ05	400 - 800	fz	~0.29	~0.30	~0.30	~0.39
			ap	~2.0	~3.5	~4.0	~5.5
			ae	0.6 Dc	0.6 Dc	0.6 Dc	0.6 Dc

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. In case of chatter occuring, recommended to reduce ap or Vf.
3. ap should be reduced when using on low rigidity machine.
4. Use airblow. (For cutting Aluminium, Titanium & Heat resistant alloy Wet cutting is recommended.)
5. When cutting Hard materials (50-55HRC), reduce ap, n & Vf by 30% from standard conditions.

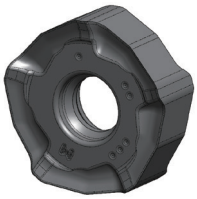
PNS–REBORN PNS Type

Feature 1 Economical double-sided 10-edge Inserts

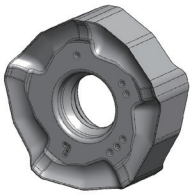
5 inserts available



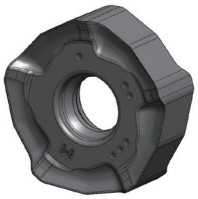
PNMU190720AER-MM
DS250



PNMU190720AER-PM
DP117



PNMU190720AER-PL
DP117/DP150



PNMU190720AER-KM
DH103

Cat. No.	Grade	Carbon steel	Alloy steel	Pre-hardened steel	Hardened steel	Cast iron	Stainless steel
PNMU190720AER-MM	DS250	○	◎				◎
PNMU190720AER-PM	DP117			○	◎	○	
PNMU190720AER-PL	DP117			◎	○	○	
PNMU190720AER-PL	DP150	◎	○				○
PNMU190720AER-KM	DH103					◎	

◎: First choice ○: Second choice

Feature 2 Equipped with Two Different Entry Angles



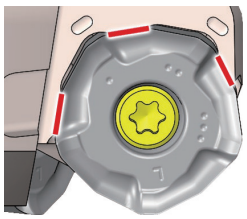
45°

Large Depth of Cut

Enables **large depth of cut** and efficient machining **on high-rigidity machines**.

ap max=5mm

▶ Watch the Video



Rigid Insert Clamping
Three-face constraint provides rigidity and stability in heavy cutting.

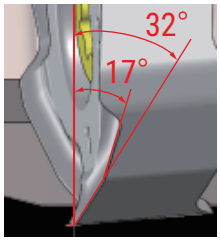


27°

High-Feed Machining

Enables **high-feed machining** at depths of cut below 2.5 mm.

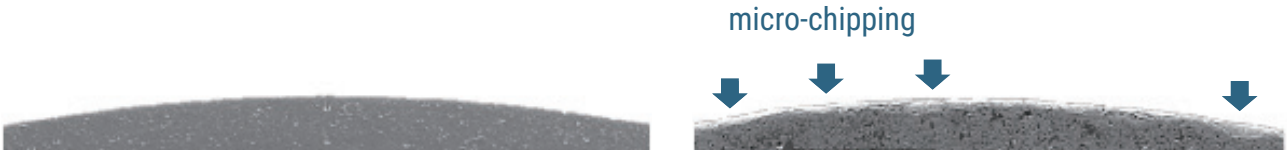
ap ≦ 2.5mm



Helical cutting edge
The large axial rake angle allows for smooth machining.

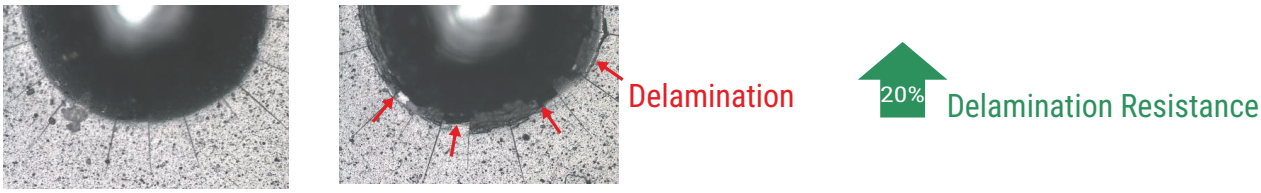
Feature 3 DP117 / DP150 – New PVD Coating Grades

1. Improved coating toughness enhances edge stability and **reduces micro-chipping**.



DP1 Coating　　Conventional Coating

2. **Stronger coating–substrate adhesion** improves delamination resistance by approx. 20%, ensuring stable, reliable cutting.

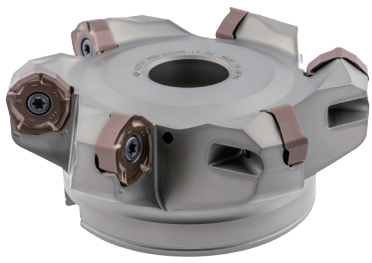


DP1 Coating　　Conventional Coating

■ Application

ISO	P					M					K				H			
	P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30	H01	H10	H20	H30
Application Range	NEW DP117										DH103				NEW	DP117		
		NEW DP150					NEW	DP150			NEW	DP117						
			DS250					DS250										

Feature 4 Two Cutter Body Types Available



Coarse Pitch
(ø100mm / 6 flutes)



Fine Pitch
(ø100mm / 9 flutes)

PNS–REBORN

Face Milling

PNS TYPE Bore Type

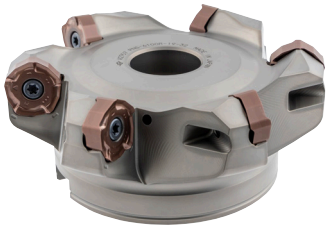


Fig. 1

G-Body Through coolant hole

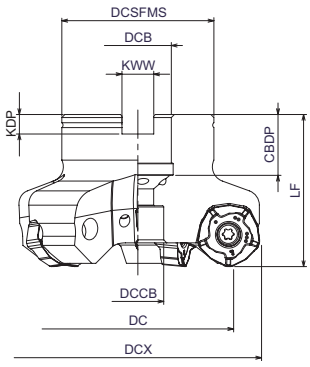


Fig. 2

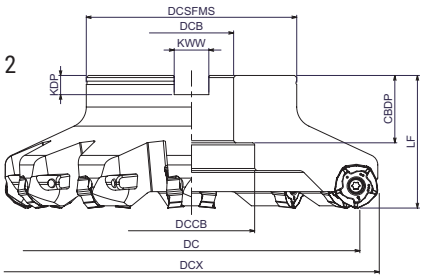
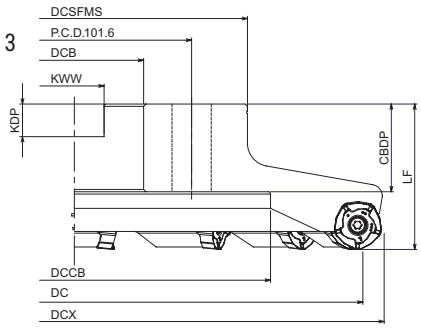


Fig. 3



	Cat.No.	Stock	No. of inserts	Dimensions (mm)									Arbor set bolt	Weight (kg)	Fig.	Insert
				DC	DCX	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP				
Coarse Pitch	PNS-3050R-19-22	●	3	50	68.4	50	47	22	17	10.4	6.3	20	M10	0.57	1	PNMU190720AER-**
	PNS-4063R-19-22	●	4	63	81.4	50	50	22	17	10.4	6.3	20	M10	0.81	1	
	PNS-5080R-19-27	●	5	80	98.3	50	56	27	20	12.4	7	22	M12×1.75×30★	1.12	1	
	PNS-6100R-19-32	●	6	100	118.3	50	85	32	26	14.4	8	25	M16×2×30★	2.04	1	
	PNS-7125R-19-40	●	7	125	143.3	63	100	40	32	16.4	9	32	M20×2.5×40★	3.81	1	
	PNS-8160R-19-40	●	8	160	178.4	63	100	40	60	16.4	9	32	M20	4.41	2	
	PNS-10200R-19-60	●	10	200	218.4	63	150	60	140	25.7	14	38	M16	6.68	3	
	PNS-12250R-19-60	●	12	250	268.4	63	150	60	170	25.7	14	38	M16	8.75	3	
Fine Pitch	PNS-4050R-19-22	●	4	50	68.4	50	47	22	17	10.4	6.3	20	M10	0.60	1	
	PNS-5063R-19-22	●	5	63	81.4	50	50	22	17	10.4	6.3	20	M10	0.82	1	
	PNS-7080R-19-27	●	7	80	98.3	50	56	27	20	12.4	7	22	M12×1.75×30★	1.11	1	
	PNS-9100R-19-32	●	9	100	118.3	50	85	32	26	14.4	8	25	M16×2×30★	2.09	1	
	PNS-11125R-19-40	●	11	125	143.3	63	100	40	32	16.4	9	32	M20×2.5×40★	3.85	1	
	PNS-12160R-19-40	●	12	160	178.4	63	100	40	60	16.4	9	32	M20	4.53	2	
	PNS-14200R-19-60	●	14	200	218.4	63	150	60	140	25.7	14	38	M16	6.90	3	
	PNS-16250R-19-60	●	16	250	268.4	63	150	60	170	25.7	14	38	M16	9.10	3	

Screw	Torque(N.m)	Wrench
CSW-513H	5.5	A-20

Insert


PNMU190720AER-MM


PNMU190720AER-PM


PNMU190720AER-PL


PNMU190720AER-KM

Fig. 1

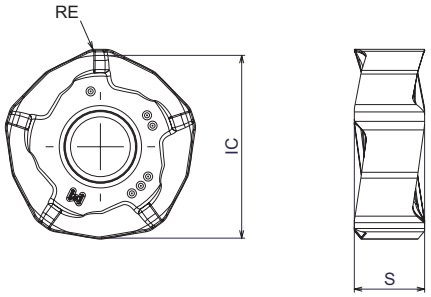
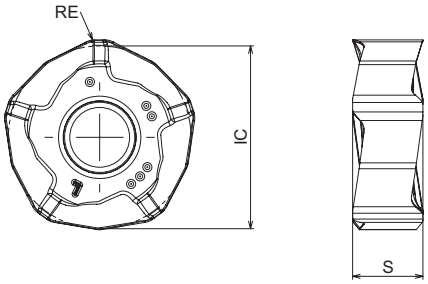
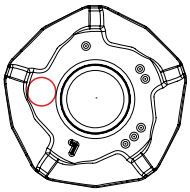


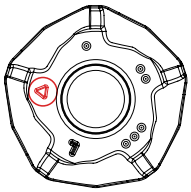
Fig. 2



Cat.No.	Tolerance	PVD Coating				Dimensions (mm)			Fig.
		DS250	DP117	DP150	DH103	RE	IC	S	
PNMU190720AER-MM	M	●				2	19.5	7.5	1
PNMU190720AER-PM	M		●			2	19.5	7.5	1
PNMU190720AER-PL	M		●	●		2	19.5	7.5	2
PNMU190720AER-KM	M				●	2	19.5	7.5	1

GRADE MARKINGS

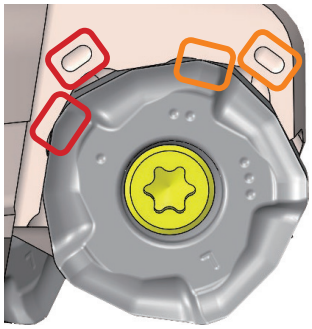

PNMU190720AER-PL DP117


PNMU190720AER-PL DP150

⚠ Ensure correct insert positioning before mounting



✓ **Correct – Recommended**



✗ **Poor contact – Not acceptable**

The indication mark on the cutter body and the corner of the insert must be in the same position when mounting the inserts.

■ Recommended Cutting Conditions | Deep face milling | PNS type (ap ≤ 5 mm)

Material	Insert	Grade	*Vc* (m/min)	*fz* (mm/t)	*ap* (mm)
Carbon Steel below250HB	PNMU190720AER-PL (PNMU190720AER-MM)	DP150 (DS250)	140 – 180	0.25 – 0.35	4.0 – 5.0
Cast Steel below 285HB	PNMU190720AER-MM (PNMU190720AER-PL)	DS250 (DP150)	120 – 160	0.25 – 0.3	4.0 – 5.0
Tool & Die Steel below 255HB	PNMU190720AER-MM (PNMU190720AER-PL)	DS250 (DP150)	90 – 130	0.2 – 0.25	3.0 – 5.0
Mold Steel 30-36HRC	PNMU190720AER-PL (PNMU190720AER-PM)	DP117 (DP150)	90 – 130	0.25 – 0.3	4.0 – 5.0
Mold Steel 38-43HRC	PNMU190720AER-PL (PNMU190720AER-PM)	DP117	80 – 120	0.2 – 0.25	3.0 – 5.0
Grey Cast Iron 160-260HB	PNMU190720AER-KM (PNMU190720AER-PL) (PNMU190720AER-PM)	DH103 (DP117)	140 – 180	0.35 – 0.4	4.0 – 5.0
Nodular Cast Iron 170-300HB	PNMU190720AER-KM (PNMU190720AER-PL) (PNMU190720AER-PM)	DH103 (DP117)	120 – 160	0.3 – 0.35	3.0 – 5.0
Austenitic Stainless Steel	PNMU190720AER-MM (PNMU190720AER-PL)	DS250 (DP150)	80 – 120	0.2 – 0.25	3.0 – 5.0
Martensitic Stainless Steel	PNMU190720AER-MM (PNMU190720AER-PL)	DS250 (DP150)	90 – 130	0.25 – 0.3	4.0 – 5.0

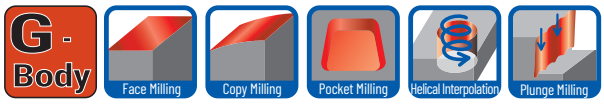
Note)
1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use air blow.

■ Recommended Cutting Conditions | High feed machining | PNS type (ap ≤ 2.5 mm)

Material	Insert	Grade	*Vc* (m/min)	*fz* (mm/t)	*ap* (mm)
Carbon Steel below250HB	PNMU190720AER-PL (PNMU190720AER-MM)	DP150 (DS250)	160 – 200	0.6 – 0.7	1.5 – 2.0
Cast Steel below 285HB	PNMU190720AER-MM (PNMU190720AER-PL)	DS250 (DP150)	140 – 180	0.5 – 0.6	1.5 – 2.0
Tool & Die Steel below 255HB	PNMU190720AER-MM (PNMU190720AER-PL)	DS250 (DP150)	110 – 150	0.4 – 0.5	1.0 – 2.0
Mold Steel 30-36HRC	PNMU190720AER-PL (PNMU190720AER-PM)	DP117 (DP150)	110 – 150	0.5 – 0.6	1.5 – 2.0
Mold Steel 38-43HRC	PNMU190720AER-PL (PNMU190720AER-PM)	DP117	100 – 140	0.4 – 0.5	1.0 – 2.0
Hardened Die Steel 42-52HRC	PNMU190720AER-PM (PNMU190720AER-PL)	DP117	30 – 70	0.15 – 0.2	0.5 – 0.8
Grey Cast Iron 160-260HB	PNMU190720AER-KM (PNMU190720AER-PL) (PNMU190720AER-PM)	DH103 (DP117)	170 – 200	0.7 – 0.8	2.0 – 2.5
Nodular Cast Iron 170-300HB	PNMU190720AER-KM (PNMU190720AER-PL) (PNMU190720AER-PM)	DH103 (DP117)	140 – 180	0.5 – 0.6	1.0 – 2.0
Austenitic Stainless Steel	PNMU190720AER-MM (PNMU190720AER-PL)	DS250 (DP150)	120 – 160	0.5 – 0.6	1.0 – 2.0
Martensitic Stainless Steel	PNMU190720AER-MM (PNMU190720AER-PL)	DS250 (DP150)	140 – 180	0.4 – 0.5	1.0 – 2.0

Note)
1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. In case of chatter ocurring, recommended to reduce ap or rpm and keep feed per tooth.
3. ap should be reduced when using on low rigidity machine.
4. Use air blow.

HEPTA MILL — HEP Type



HEP TYPE

High Feed Mill with 7 Cutting-Edge

- Max. Depth of cut 5mm at fz=1mm/tooth is possible.
- Insert with thickness 6.35mm is durable for heavy roughing.
- Heptagonal insert with unique geometry for lower cutting force.
- Multi functional cutter for ramping , pocket milling , plunging.



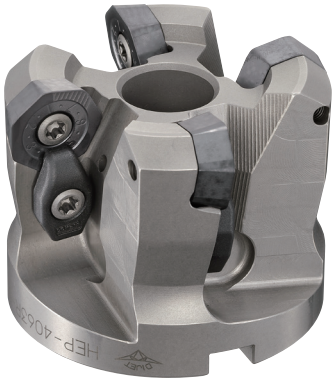


Fig.1

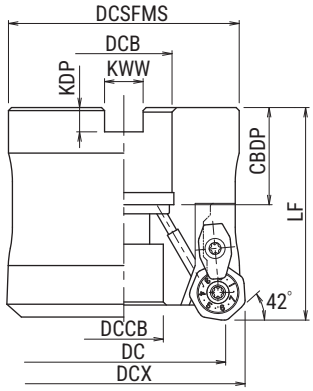


Fig.2

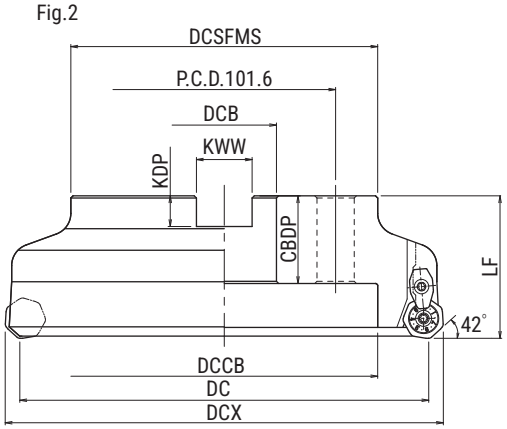
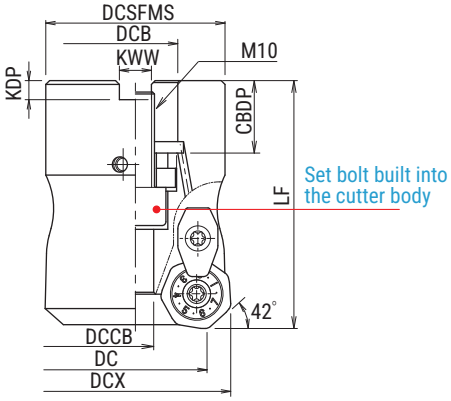


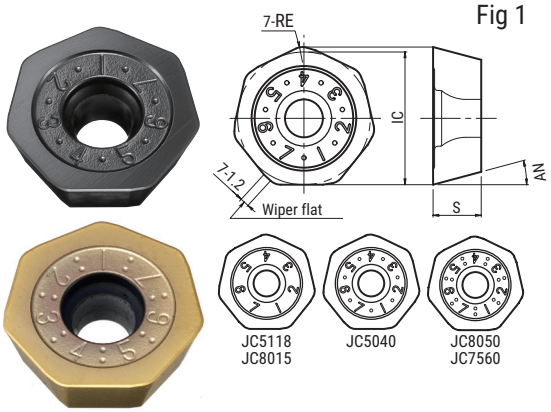
Fig.3

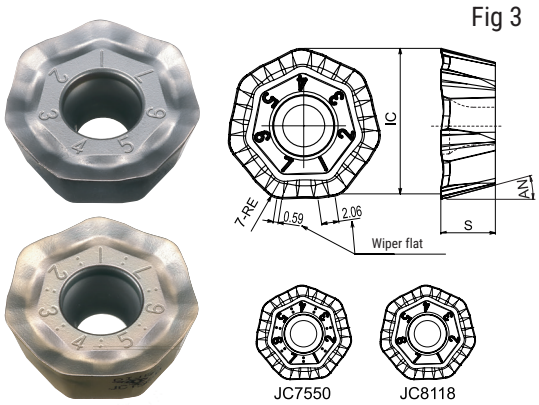


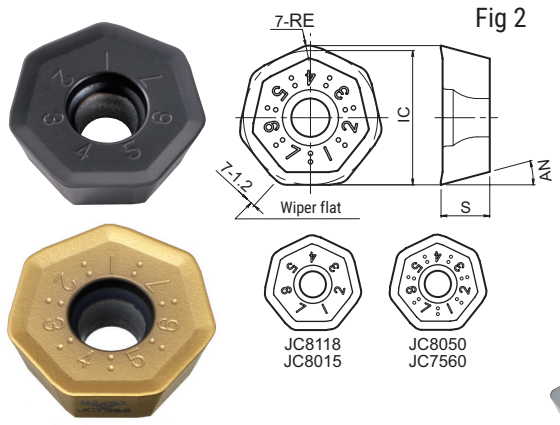
Cat.No.	Stock	No. of inserts	Dimensions (mm)									Arbor set bolt	Parts		Weight (kg)	Inserts	Fig.
			DC	DCX	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP		Screw	Wrench			
HEP-3050R-08-22	●	3	36.7	50	65	47	22	9.6	10.4	6.3	19	M10X1.5X25	DSW-4512H	A-20	0.9	XD**080...	3
HEP-4063R-08-22	●	4	49.5	63	50	60	22	17	10.4	6.3	20	M10			1.1		1
HEP-4063R-08-27	●	4	49.5	63	50	60	27	20	12.4	7	22	M12X1.75X30			1.1		
HEP-5080R-08-27	●	5	66.6	80	55	76	27	20	12.4	7	22	M12X1.75X40			1.9		
HEP-6100R-08-32	●	6	86.6	100	70	96	32	26	14.4	8	32	M16X2X45			3.6		
HEP-7125R-08-40	●	7	111.6	125	70	100	40	32	16.4	9	35	M20X2.5X45			5.5		
HEP-8160R-08-40	●	8	146.6	160	70	100	40	32	16.4	9	35	M20X2.5X45		A-20L	8.4		
HEP-9200R-08-60	●	9	186.6	200	65	140	60	140	25.4	14.3	40	M16			10.2		2

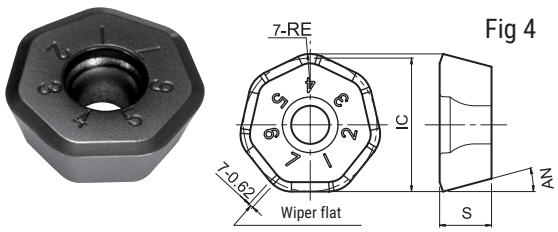
Screw	Torque(N.m)
DSW-4512H	6

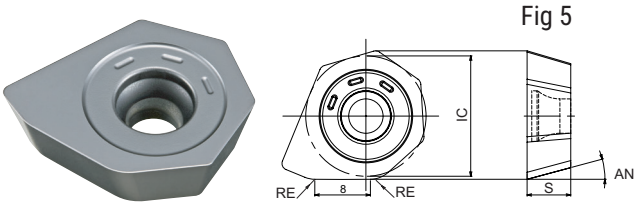
Insert











Cat.No.	Tolerance	PVD Coating							Dimensions(mm)				Fig.
		JC5040	JC7550	JC7560	JC8011	JC8015	JC8050	JC8118	RE	IC	S	AN	
XDMW080620ZTR	M	●		●			●	●	2	17.5	6.35	15°	1
XDMW080635ZTR-S						●			3.5				4
XDMT080620ZER				●			●	●	2				2
XDMT080620ZER-ML			●					●		17.341	6.5		3
XDHW080610ZER-W	H				●				4	17.5	6.35		5

HEPTA MILL HEP Type

■ Recommended Cutting Conditions

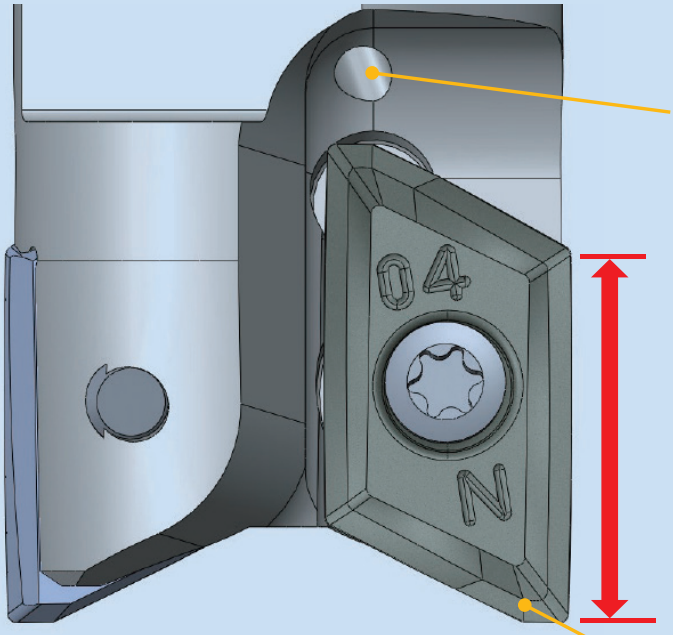
Material	Insert	Grade	General Cutting			Unstable Cutting			ae
			Vc	fz	ap	Vc	fz	ap	
Carbon Steel below 250HB	XDMT080620ZER (XDMW080620ZTR) [XDMW080620ZTR]	JC7560 (JC5040) [JC7560]	140	~0.8	~4	120	~0.8	~4	0.7 Dc
Tool & Die Steel below 255HB	XDMT080620ZER (XDMW080620ZTR) [XDMW080620ZTR]	JC7560 (JC5040) [JC7560]	140	~0.7	~3	120	~0.7	~3	0.7 Dc
Mold Steel 30-36 HRC	XDMT080620ZER (XDMT080620ZER) [XDMW080620ZTR]	JC8118 (JC7560) [JC5040]	140	~0.7	~3	120	~0.7	~3	0.7 Dc
Mold Steel 38-43 HRC	XDMT080620ZER (XDMT080620ZER) [XDMW080620ZTR]	JC8118 (JC8015) [JC8118]	100	~0.7	~3	90	~0.7	~3	0.7 Dc
Hardened Die Steel 42-52 HRC	XDMT080620ZER (XDMT080620ZER) [XDMW080620ZTR]	JC8118 (JC8015) [JC8118]	70	~0.4	~2	70	~0.3	~2	0.4 Dc
Grey Cast Iron	XDMT080620ZTR (XDMT080620ZTR) [XDMW080635ZTR-S]	JC8015 (JC8118) [JC8015]	140	~1.0	~5	120	~1.0	~5	0.7 Dc
Nodular Cast Iron	XDMT080620ZTR (XDMT080620ZTR) [XDMW080635ZTR-S]	JC8015 (JC8118) [JC8015]	120	~0.8	~4	100	~0.7	~4	0.7 Dc
Austenitic Stainless Steel	XDMT080620ZER (XDMT080620ZER) [XDMT080620ZER-ML]	JC8050 (JC7560) [JC7550]	120	~0.5	~4	100	~0.5	~4	0.7 Dc
Titanium Alloy	XDMT080620ZER-ML (XDMT080620ZER) [XDMT080620ZER]	JC7550 JC5040 [JC8118]	60	~0.3	~3	50	~0.2	~3	0.6 Dc
Heat Resistant Alloy	XDMT080620ZER-ML (XDMT080620ZER) [XDMT080620ZER]	JC8118 (JC8118) [JC8015]	30	~0.2	~2	25	~0.2	~2	0.5 Dc

Note
1. Please adjust cutting conditions according to machine rigidity or work rigidity.
2. In case of chatter occuring, recommended to reduce ap or Vf.
3. Use airblow.
4. XDMW080635ZTR-S is recommended to cut cast steel with crusty and nonuniform surface.

Aerospace Tooling

High Precision and High Efficient Machining on Aerospace tooling





Through coolant hole

High Precision

Combination of high accuracy body and ground insert gives excellent side wall finish.

High Efficiency

Sharp & Unique 3D geometry insert enables high efficiency and low cutting resistance machining. Key in insert gives added security allowing high speed spindle machining.

Multi function

Capable of ramping and helical interpolation.

AMX/MAM TYPE



- Bore type
  Ø40–Ø80
- Modular Head type
  Ø16–Ø42

MAX.ap = 8mm

XOET0803..PDFR
grade: FZ05



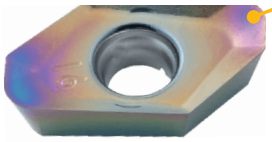
RE: 0.2–2.0

grade: DS217



RE: 0.4–2.0

grade: DN103



RE: 0.2–2.0

ALX/MAL TYPE



- Bore type
  Ø50–Ø63
- Modular Head type
  Ø20–Ø40
- Shank type
  Ø20–Ø40

MAX.ap = 15mm

XOGT1605..PDFR
grade: FZ05



RE: 0.2–4.0

XOGT1605..PDER
grade: JC5118



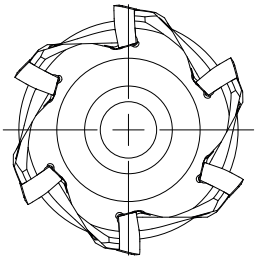
RE: 0.2–3.2

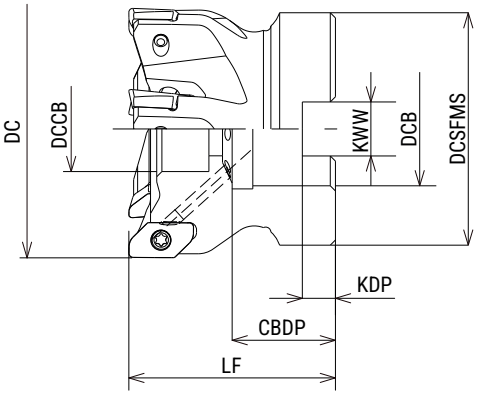
AERO CHIPPER AMX/MAM Type

AMX TYPE Bore Type

Through coolant hole | G - Body | Shoulder Milling | Slotting | Copy Milling | Pocket Milling | Helical Interpolation







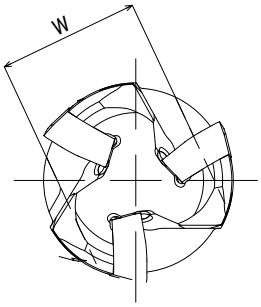
Cat.No.	Stock	No. of inserts	Dimensions(mm)								Max. spindle speed (min^{-1})	Weight (kg)	Inserts
			DC	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP			
AMX-6040R-16	●	6	40	40	35	16	14	8.4	5.6	18	28,000	0.2	XOET0803**PDFR
AMX-7050R-22	●	7	50	40	45	22	16.5	10.4	6.3	20	24,000	0.3	
AMX-8063R-22	●	8	63	40	50	22	17	10.4	6.3	20	21,000	0.48	
AMX-9080R-22	○	9	80	40	50	22	17	10.4	6.3	20	18,000	0.68	
AMX-9080R-27	●	9	80	50	60	27	20	12.4	7	22	18,000	1.01	

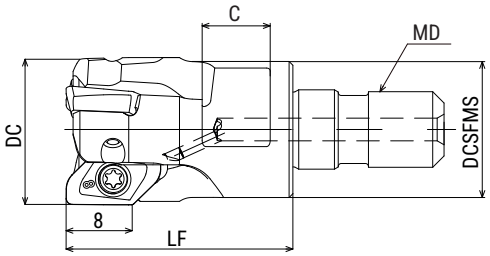
Screw	Torque(N.m)	Wrench
TSW-2567H	1.1	A-08

Through coolant hole | Shoulder Milling | Slotting | Copy Milling | Pocket Milling | Helical Interpolation

MAM TYPE Modular Type







Cat.No.	Stock	No. of inserts	Dimensions(mm)						Max. spindle speed (min^{-1})	Parts	Inserts
			DC	LF	DCSFMS	MD	C	W		Clamp screw	
MAM-2016-M8	●	2	16	23	14	M8	8	12	40,000	TSW-2556H	XOET0803**PDFR
MAM-2018-M8	○	2	18	23	14	M8	8	12	40,000		
MAM-3020-M10	●	3	20	30	18	M10	9	14	40,000		
MAM-3022-M10	○	3	22	30	18	M10	9	14	40,000		
MAM-3025-M12	○	3	25	35	22	M12	11	19	40,000	TSW-2567H	
MAM-4025-M12	●	4	25	35	22	M12	11	19	40,000		
MAM-4028-M12	○	4	28	35	23.6	M12	11	19	36,000		
MAM-4030-M16	○	4	30	43	27	M16	12	22	34,000		
MAM-5032-M16	●	5	32	43	29	M16	12	22	33,000		
MAM-5035-M16	○	5	35	43	32	M16	14	26	31,000		
MAM-6040-M16	●	6	40	43	32	M16	14	26	28,000		
MAM-6042-M16	○	6	42	43	32	M16	14	26	27,000		

Screw	Torque(N.m)	Wrench
TSW-2556H	1.1	A-08
TSW-2567H		

AMX/MAM TYPE Insert

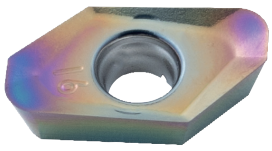
FZ05

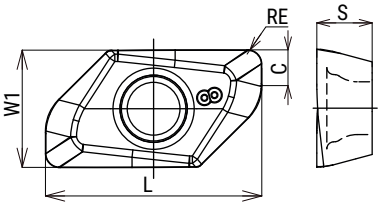


DS217



DN103





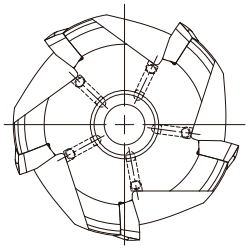
Cat.No.	Tolerance	Uncoated	PVD Coating	DLC Coating	Dimensions (mm)				
		FZ05	DS217	DN103	RE	L	W1	S	C
XOET080302PDFR	E	●		●	0.2	12.5	6.8	3.2	1.5
XOET080304PDFR	E	●		●	0.4	12.5	6.8	3.2	1.7
XOET080304PDER	E		●		0.4	12.5	6.8	3.2	1.5
XOET080308PDFR	E	●		●	0.8	12.5	6.8	3.2	2
XOET080308PDER	E		●		0.8	12.5	6.8	3.2	1.5
XOET080316PDFR	E	●		●	1.6	12.5	6.8	3.2	2.9
XOET080320PDFR	E	●		●	2.0	12.5	6.8	3.2	3
XOET080320PDER	E		●		2.0	12.5	6.8	3.2	2.5

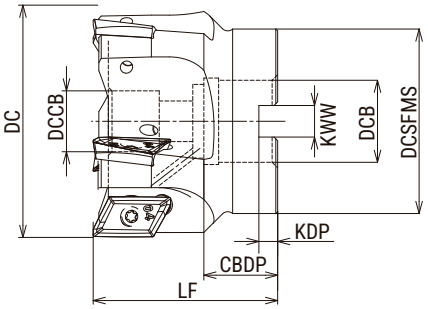
AERO CHIPPER — ALX/MAL Type

Through coolant hole | G - Body | Shoulder Milling | Slotting | Copy Milling | Pocket Milling | Helical Interpolation

ALX TYPE — Bore Type







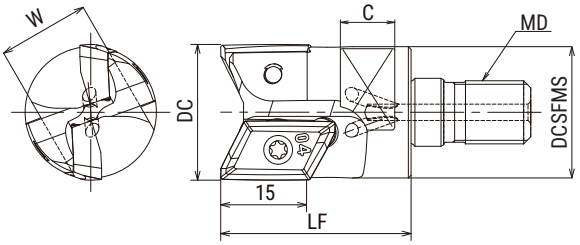
Cat.No.	Stock	No. of inserts	Dimensions(mm)								Max. spindle speed (min^{-1})	Weight (kg)	Inserts
			DC	LF	DCSFMS	DCB	DCCB	KWW	KDP	CBDP			
ALX4050R-22	●	4	50	50	45	22	16.5	10.4	6.3	20	24,000	0.4	XOGT1605**PD*R
ALX5063R-22	●	5	63	50	50	22	16.5	10.4	6.3	20	21,000	0.6	

Screw	Torque (N.m)	Wrench
DSW-4085	3.6	A-15T

Through coolant hole | G - Body

MAL TYPE — Modular Type





Cat.No.	Stock	No. of inserts	Dimensions(mm)						Max. spindle speed (min^{-1})	Inserts
			DC	LF	DCSFMS	MD	C	W		
MAL-1020-M10	●	1	20	35	19.5	M10	9	14	15,000	XOGT1605**PD*R
MAL-2025-M12	●	2	25	35	24	M12	11	19	40,000	
MAL-2028-M12	○	2	28	35	24	M12	10	19	36,000	
MAL-2030-M16	○	2	30	43	28	M16	12	22	34,000	
MAL-2032-M16	●	2	32	43	29	M16	12	22	33,000	
MAL-2035-M16	○	2	35	43	29	M16	12	22	31,000	
MAL-3040-M16	●	3	40	43	32	M16	14	26	28,000	

Screw	Torque (N.m)	Wrench
DSW-4085	3.6	A-15

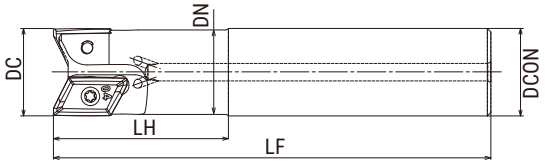


When using inserts with corner radius RE 4 (XOGT160540PDFR), Standard cutter body has to be modified with R2.6 or C2.3

Through coolant hole | G - Body | Shoulder Milling | Slotting | Copy Milling | Pocket Milling | Helical Interpolation

ALXM TYPE Shank Type





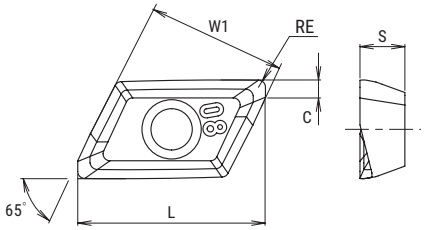
Cat.No.	Stock	No. of inserts	Dimensions(mm)					Max. spindle speed	Parts		Inserts
			DC	LH	LF	DN	DCON		Screw	Wrench	
ALXM1020S20	●	1	20	35	110	19.18	20	15,000	DSW-4075H	A-15	XOGT1605**PD*R
ALXM2025S25	●	2	25	50	125	24	25	40,000	DSW-4085		
ALXM2028S25	●	2	28	50	125	26.87	25	36,000			
ALXM2032S32	●	2	32	50	150	30.5	32	33,000			
ALXM2035S32	○	2	35	50	150	33.32	32	31,000			
ALXM3040S32	●	3	40	80	170	37.96	32	28,000			

Screw	Torque (N.m)
DSW-4075H	3.6
DSW-4085	3.6

ALX/MAL TYPE Insert





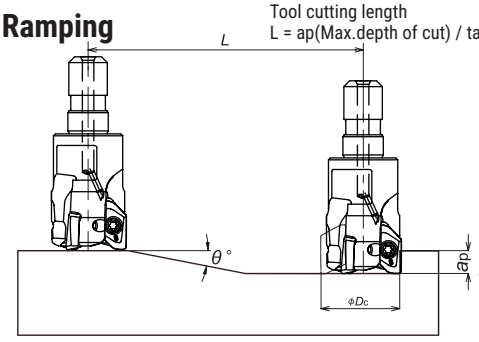


Cat.No.	Tolerance	PVD Coating	Uncoated	Dimensions (mm)				
		JC5118	FZ05	RE	L	W1	S	C
XOGT160502PDFR	G		●	0.2	20.8	16.35	5	2.5
XOGT160504PDFR	G		●	0.4	21.0	16.35	5	2.4
XOGT160508PDFR	G		●	0.8	21.0	16.35	5	2.4
XOGT160512PDFR	G		●	1.2	20.9	16.35	5	2.5
XOGT160516PDFR	G		●	1.6	20.7	16.35	5	2.6
XOGT160520PDFR	G		●	2.0	20.6	16.35	5	2.8
XOGT160525PDFR	G		○	2.5	20.3	16.35	5	3.0
XOGT160530PDFR	G		●	3.0	20.1	16.35	5	3.3
XOGT160532PDFR	G		●	3.2	19.9	16.35	5	3.5
XOGT160540PDFR	G		●	4.0	19.2	16.35	5	4.3
XOGT160502PDER	G	●		0.2	20.8	16.35	5	2.5
XOGT160504PDER	G	●		0.4	21.0	16.35	5	2.4
XOGT160508PDER	G	●		0.8	21.0	16.35	5	2.4
XOGT160512PDER	G	●		1.2	20.9	16.35	5	2.5
XOGT160516PDER	G	●		1.6	20.7	16.35	5	2.6
XOGT160520PDER	G	○		2.0	20.6	16.35	5	2.8
XOGT160530PDER	G	●		3.0	20.1	16.35	5	3.3
XOGT160532PDER	G	○		3.2	19.9	16.35	5	3.5

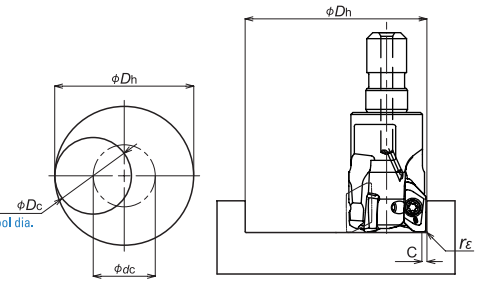
AERO CHIPPER AMX/MAM Type

■ Recommended Data for Profile Milling

Ramping



Helical interpolation



● Calculation of tool pass dia.

$$Ødc = ØDh - ØDc$$

Tool pass dia. Bore dia. Tool dia.

● Depth of cut per one circuit should not exceed max. depth of cut ap.

● Down cutting is recommended, so tool pass rotation should be counterclockwise.

XOET080302PDFR

Tool dia.	Eff. Cutting dia. (mm)	Max.depth of cut (mm)	Ramping		Helical interpolation			Max. drilling depth
			Max. ramping angle θ°	Total cutting length at Max.ap L	Through hole Min. bore dia. Dh min (mm)	Flat bottom Min.bore dia. Dh min (mm)	Through hole Max. bore dia. Dh max (mm)	
16	15.5	5	18.0	15.4	20	29.5	31	2.5
18	17.5	5	17.5	15.9	24	33.5	35	2.5
20	19.5	5	14.0	20.1	28	37.5	39	2.5
22	21.5	5	12.5	22.6	32	41.5	43	2.5
25	24.5	5	10.0	28.4	38	47.5	49	2.5
28	27.5	5	8.5	33.5	44	53.5	55	2.5
30	29.5	5	7.5	38.0	48	57.5	59	2.5
32	31.5	5	7.0	40.7	52	61.5	63	2.5
35	34.5	5	6.0	47.6	58	67.5	69	2.5
40 (42)	39.5 (41.5)	5	5.0	57.2	68 (72)	77.5 (81.5)	79 (83)	2.5
50	49.5	5	4.0	71.5	88	97.5	99	2.5
63	62.5	5	3.0	95.4	114	123.5	125	2.5
80	79.5	5	2.5	114.5	148	160.0	159	2.5

XOET080304PDFR

Tool dia.	Eff. Cutting dia. (mm)	Max.depth of cut (mm)	Ramping		Helical interpolation			Max. drilling depth
			Max. ramping angle θ°	Total cutting length at Max.ap L	Through hole Min. bore dia. Dh min (mm)	Flat bottom Min.bore dia. Dh min (mm)	Through hole Max. bore dia. Dh max (mm)	
16	15.1	5	18.0	15.4	20	29.0	31	2.5
18	17.1	5	17.5	15.9	24	33.0	35	2.5
20	19.1	5	14.0	20.1	28	37.0	39	2.5
22	21.1	5	12.5	22.6	32	37.0	43	2.5
25	24.1	5	10.0	28.4	38	47.0	49	2.5
28	27.1	5	8.5	33.5	44	53.0	55	2.5
30	29.1	5	7.5	38.0	48	57.0	59	2.5
32	31.1	5	7.0	40.7	52	61.0	63	2.5
35	34.1	5	6.0	47.6	58	67.0	69	2.5
40 (42)	39.1 (41.1)	5	5.0	57.2	68 (72)	77.0 (81.0)	79 (83)	2.5
50	49.1	5	4.0	71.5	88	97.0	99	2.5
63	62.1	5	3.0	95.4	114	123.0	125	2.5
80	79.1	5	2.5	114.5	148	157.5	159	2.5

XOET080308PDFR

Tool dia.	Eff. Cutting dia. (mm)	Max.depth of cut (mm)	Ramping		Helical interpolation			Max. drilling depth
			Max. ramping angle θ°	Total cutting length at Max.ap L	Through hole Min. bore dia. Dh min (mm)	Flat bottom Min.bore dia. Dh min (mm)	Through hole Max. bore dia. Dh max (mm)	
16	14.3	5	18.0	15.4	20	28.5	31	2.5
18	16.3	5	17.5	15.9	24	32.5	35	2.5
20	18.3	5	14.0	20.1	28	36.5	39	2.5
22	18.3	5	12.5	22.6	32	36.5	43	2.5
25	23.3	5	10.0	28.4	38	46.5	49	2.5
28	26.3	5	8.5	33.5	44	52.5	55	2.5
30	28.3	5	7.5	38.0	48	56.5	59	2.5
32	30.3	5	7.0	40.7	52	60.5	63	2.5
35	33.3	5	6.0	47.6	58	66.5	69	2.5
40 (42)	38.3 (40.3)	5	5.0	57.2	68 (72)	76.5 (80.5)	79 (83)	2.5
50	48.3	5	4.0	71.5	88	96.5	99	2.5
63	61.3	5	3.0	95.4	114	122.5	125	2.5
80	78.3	5	2.5	114.5	148	156.5	159	2.5

XOET080316PDFR

Tool dia.	Eff. Cutting dia. (mm)	Max.depth of cut (mm)	Ramping		Helical interpolation			Max. drilling depth
			Max. ramping angle θ°	Total cutting length at Max.ap L	Through hole Min. bore dia. Dh min (mm)	Flat bottom Min.bore dia. Dh min (mm)	Through hole Max. bore dia. Dh max (mm)	
16	12.7	5	18.0	15.4	20	27.0	31	2.5
18	14.7	5	17.5	15.9	24	31.0	35	2.5
20	16.7	5	14.0	20.1	28	35.0	39	2.5
22	16.7	5	12.5	22.6	32	35.0	43	2.5
25	21.7	5	10.0	28.4	38	45.0	49	2.5
28	24.7	5	8.5	33.5	44	51.0	55	2.5
30	26.7	5	7.5	38.0	48	55.0	59	2.5
32	28.7	5	7.0	40.7	52	59.0	63	2.5
35	31.7	5	6.0	47.6	58	65.0	69	2.5
40 (42)	36.7 (38.7)	5	5.0	57.2	68 (72)	75.0 (79.0)	79 (83)	2.5
50	46.7	5	4.0	71.5	88	94.5	99	2.5
63	59.7	5	3.0	95.4	114	120.5	125	2.5
80	76.7	5	2.5	114.5	148	157.5	159	2.5

XOET080320PDFR

Tool dia.	Eff. Cutting dia. (mm)	Max.depth of cut (mm)	Ramping		Helical interpolation			Max. drilling depth
			Max. ramping angle θ°	Total cutting length at Max.ap L	Through hole Min. bore dia. Dh min (mm)	Flat bottom Min.bore dia. Dh min (mm)	Through hole Max. bore dia. Dh max (mm)	
16	11.9	5	18.0	15.4	20	26.5	31	2.5
18	13.9	5	17.5	15.9	24	30.5	35	2.5
20	15.9	5	14.0	20.1	28	34.5	39	2.5
22	15.9	5	12.5	22.6	32	34.5	43	2.5
25	20.9	5	10.0	28.4	38	44.5	49	2.5
28	23.9	5	8.5	33.5	44	50.5	55	2.5
30	25.9	5	7.5	38.0	48	54.5	59	2.5
32	27.9	5	7.0	40.7	52	58.5	63	2.5
35	30.9	5	6.0	47.6	58	64.5	69	2.5
40 (42)	35.9 (37.9)	5	5.0	57.2	68 (72)	74.5 (78.5)	79 (83)	2.5
50	45.9	5	4.0	71.5	88	94.5	99	2.5
63	58.9	5	3.0	95.4	114	120.5	125	2.5
80	75.9	5	2.5	114.5	148	156.5	159	2.5

AERO CHIPPER AMX/MAM Type

■ Recommended Cutting Conditions | Shoulder Milling

● Bore Type

Material	Grade	Tool dia. (mm)									
		40					50				
		6N					7N				
		ℓ (mm)	ap (mm)	ap×ae (mm)	n (mm⁻¹)	Vf (mm/min)	ℓ (mm)	ap (mm)	ap×ae (mm)	n (mm⁻¹)	Vf (mm/min)
Aluminium Alloy 50-110HB	FZ05 DN103	100	8	80	6,000	5,400	100	8	100	5,700	5,990
		150	6	42	6,000	5,400	150	8	80	5,700	5,990
		200	5	30	4,800	4,320	200	6	60	4,600	4,830
Austenitic Stainless Steel	DS217	100	6	27	800	480	100	6	30	760	530
		150	5	18	800	480	150	6	24	760	530
		200	4	9	660	400	200	4	16	640	450
Titanium Alloy	DS217	100	6	27	530	250	100	6	30	510	290
		150	5	18	530	250	150	6	24	510	290
		200	4	9	400	190	200	4	16	380	210

Material	Grade	Tool dia. (mm)									
		63					80				
		8N					9N				
		ℓ (mm)	ap (mm)	ap×ae (mm)	n (mm⁻¹)	Vf (mm/min)	ℓ (mm)	ap (mm)	ap×ae (mm)	n (mm⁻¹)	Vf (mm/min)
Aluminium Alloy 50-110HB	FZ05 DN103	100	8	126	4,500	5,400	100	8	160	3,600	4,860
		150	8	126	4,500	5,400	150	8	160	3,600	4,860
		200	8	96	4,500	5,400	200	8	160	2,900	3,920
Austenitic Stainless Steel	DS217	100	6	36	610	490	100	6	42	480	430
		150	6	36	610	490	150	6	42	480	430
		200	6	27	610	490	200	6	36	480	430
Titanium Alloy	DS217	100	6	36	400	260	100	6	42	320	230
		150	6	36	400	260	150	6	42	320	230
		200	6	27	400	260	200	6	36	320	230

Note) 1. The figure to be adjusted according to the machine rigidity or work rigidity.
2. In case of catter occurring, recomemended to reduce the depth of cut ap or Spindle speed
3. If machine does not have enough power, recommend to reduce the depth of cut ap or Spindle speed and Feed speed.
4. Use of water soluble cutting oil is recommended.

■ Recommended Cutting Conditions | Shoulder Milling

● Modular Type + MSN Type carbide shank holder

Material	Grade	Tool dia. (mm)														
		16 / 18					20 / 22					25				
		2N					3N					3N				
		ℓ (mm)	ap (mm)	ap×ae (mm)	n (mm⁻¹)	Vf (mm/min)	ℓ (mm)	ap (mm)	ap×ae (mm)	n (mm⁻¹)	Vf (mm/min)	ℓ (mm)	ap (mm)	ap×ae (mm)	n (mm⁻¹)	Vf (mm/min)
Aluminium Alloy 50-110HB	FZ05 DN103	50	8	32	17,900	5,370	60	8	40	14,300	6,440	75	8	50	11,500	5,180
		80	6	15	17,900	5,370	100	6	18	14,300	6,440	125	6	24	11,500	5,180
		130	4	6	14,300	4,290	160	4	8	11,500	5,180	200	4	10	9,200	4,140
Austenitic Stainless Steel	DS217	50	6	12	2,400	480	60	6	15	1,900	570	75	6	18	1,500	450
		80	5	8	2,400	480	100	5	10	1,900	570	125	5	12	1,500	450
		130	4	4	2,000	400	160	4	5	1,600	480	200	4	6	1,300	390
Titanium Alloy	DS217	50	6	12	1,600	260	60	6	15	1,300	310	75	6	18	1,000	240
		80	5	8	1,600	260	100	5	10	1,300	310	125	5	12	1,000	240
		130	4	4	1,200	190	160	4	5	1,000	240	200	4	6	760	180

Material	Grade	Tool dia. (mm)									
		25 / 28					30				
		4N					4N				
		ℓ (mm)	ap (mm)	ap×ae (mm)	n (mm⁻¹)	Vf (mm/min)	ℓ (mm)	ap (mm)	ap×ae (mm)	n (mm⁻¹)	Vf (mm/min)
Aluminium Alloy 50-110HB	FZ05 DN103	75	8	50	11,500	6,900	90	8	60	9,500	5,700
		125	6	24	11,500	6,900	150	6	30	9,500	5,700
		200	4	10	9,200	5,520	240	4	12	7,600	4,560
Austenitic Stainless Steel	DS217	75	6	18	1,500	600	90	6	21	1,300	520
		125	5	12	1,500	600	150	5	14	1,300	520
		200	4	6	1,300	520	240	4	7	1,100	440
Titanium Alloy	DS217	75	6	18	1,020	330	90	6	21	850	270
		125	5	12	1,020	330	150	5	14	850	270
		200	4	6	760	240	240	4	7	640	200

Material	Grade	Tool dia. (mm)									
		32 / 35					40 / 42				
		5N					6N				
		ℓ (mm)	ap (mm)	ap×ae (mm)	n (mm⁻¹)	Vf (mm/min)	ℓ (mm)	ap (mm)	ap×ae (mm)	n (mm⁻¹)	Vf (mm/min)
Aluminium Alloy 50-110HB	FZ05 DN103	100	8	64	9,000	6,750	100	8	80	6,000	5,400
		160	6	30	9,000	6,750	160	6	36	6,000	5,400
		260	4	12	7,200	5,400	260	4	16	4,800	4,320
Austenitic Stainless Steel	DS217	100	6	21	1,200	600	100	6	27	800	480
		160	5	14	1,200	600	160	5	18	800	480
		260	4	7	1,000	500	260	4	9	660	400
Titanium Alloy	DS217	100	6	21	800	320	100	6	27	530	250
		160	5	14	800	320	160	5	18	530	250
		260	4	7	600	240	260	4	9	400	190

Note) 1. The figure to be adjusted according to the machine rigidity or work rigidity.
2. In case of catter occurring, recomemended to reduce the depth of cut ap or Spindle speed
3. If machine does not have enough power, recommend to reduce the depth of cut ap or Spindle speed and Feed speed.
4. Use of water soluble cutting oil is recommended.

AERO CHIPPER AMX/MAM Type

■ Recommended Cutting Conditions | Face Milling

● Bore Type

Material	Grade	Tool dia. (mm)									
		40					50				
		6N					7N				
		ℓ (mm)	ap (mm)	ae (mm)	n (mm⁻¹)	Vf (mm/min)	ℓ (mm)	ap (mm)	ae (mm)	n (mm⁻¹)	Vf (mm/min)
Aluminium Alloy 50-110HB	FZ05 DN103	100	5	28	6,000	5,400	100	5	35	5,700	5,990
		150	2.5	28	6,000	5,400	150	3.5	35	5,700	5,990
		200	1.5	28	4,800	4,320	200	2.5	35	4,600	4,830
Austenitic Stainless Steel	DS217	100	2	24	800	380	100	2	30	760	430
		150	1	24	800	380	150	1	30	760	430
		200	1	24	660	320	200	1	30	640	360
Titanium Alloy	DS217	100	2	24	530	190	100	2	30	510	210
		150	1	24	530	190	150	1	30	510	210
		200	1	24	400	140	200	1	30	380	160

Material	Grade	Tool dia. (mm)									
		63					80				
		8N					9N				
		ℓ (mm)	ap (mm)	ae (mm)	n (mm⁻¹)	Vf (mm/min)	ℓ (mm)	ap (mm)	ae (mm)	n (mm⁻¹)	Vf (mm/min)
Aluminium Alloy 50-110HB	FZ05 DN103	100	5	44	4,500	5,400	100	5	56	3,600	4,320
		150	5	44	4,500	5,400	150	5	56	3,600	4,320
		200	3	44	4,500	5,400	200	4	56	2,900	4,320
Austenitic Stainless Steel	DS217	100	2	38	610	390	100	2	48	480	310
		150	2	38	610	390	150	2	48	480	310
		200	1	38	610	390	200	2	48	480	310
Titanium Alloy	DS217	100	2	38	400	190	100	2	48	320	150
		150	2	38	400	190	150	2	48	320	150
		200	1	38	400	190	200	2	48	320	150

Note) 1. The figure to be adjusted according to the machine rigidity or work rigidity.
2. In case of catter occurring, recomemended to reduce the depth of cut ap or Spindle speed
3. If machine does not have enough power, recommend to reduce the depth of cut ap or Spindle speed and Feed speed.
4. Use of water soluble cutting oil is recommended.

■ Recommended Cutting Conditions | Face Milling

● Modular Type + MSN Type carbide shank holder

Material	Grade	Tool dia. (mm)														
		16 / 18					20 / 22					25				
		2N					3N					3N				
		ℓ (mm)	ap (mm)	ae (mm)	n (mm⁻¹)	Vf (mm/min)	ℓ (mm)	ap (mm)	ae (mm)	n (mm⁻¹)	Vf (mm/min)	ℓ (mm)	ap (mm)	ae (mm)	n (mm⁻¹)	Vf (mm/min)
Aluminium Alloy 50-110HB	FZ05 DN103	50	5	11	17,900	5,370	60	5	14	14,300	6,440	75	5	17.5	11,500	5,180
		80	2.5	11	17,900	5,370	100	2.5	14	14,300	6,440	125	2.5	17.5	11,500	5,180
		130	1	11	14,300	4,290	160	1	14	11,500	5,180	200	1	17.5	9,200	4,140
Austenitic Stainless Steel	DS217	50	2	10	2,400	380	60	2	12	1,900	460	75	2	15	1,500	360
		80	1	10	2,400	380	100	1	12	1,900	460	125	1	15	1,500	360
		130	1	10	2,000	320	160	1	12	1,600	380	200	1	15	1,300	310
Titanium Alloy	DS217	50	2	10	1,600	190	60	2	12	1,300	230	75	2	15	1,000	180
		80	1	10	1,600	190	100	1	12	1,300	230	125	1	15	1,000	180
		130	1	10	1,200	140	160	1	12	1,000	180	200	1	15	760	140

Material	Grade	Tool dia. (mm)									
		25 / 28					30				
		4N					4N				
		ℓ (mm)	ap (mm)	ae (mm)	n (mm⁻¹)	Vf (mm/min)	ℓ (mm)	ap (mm)	ae (mm)	n (mm⁻¹)	Vf (mm/min)
Aluminium Alloy 50-110HB	FZ05 DN103	75	5	17.5	11,500	6,900	90	5	21	9,500	5,700
		125	2.5	17.5	11,500	6,900	150	2.5	21	9,500	5,700
		200	1	17.5	9,200	5,520	240	1	21	7,600	4,560
Austenitic Stainless Steel	DS217	75	2	15	1,500	480	90	2	18	1,300	420
		125	1	15	1,500	480	150	1	18	1,300	420
		200	1	15	1,300	420	240	1	18	1,100	350
Titanium Alloy	DS217	75	2	15	1,000	240	90	2	18	850	200
		125	1	15	1,000	240	150	1	18	850	200
		200	1	15	760	180	240	1	18	640	150

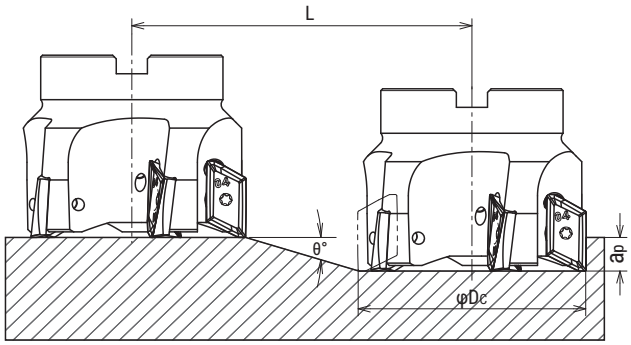
Material	Grade	Tool dia. (mm)									
		32 / 35					40 / 42				
		5N					6N				
		ℓ (mm)	ap (mm)	ae (mm)	n (mm⁻¹)	Vf (mm/min)	ℓ (mm)	ap (mm)	ae (mm)	n (mm⁻¹)	Vf (mm/min)
Aluminium Alloy 50-110HB	FZ05 DN103	100	5	22.5	9,000	6,750	100	5	28	6,000	5,400
		160	2.5	22.5	9,000	6,750	160	2.5	28	6,000	5,400
		260	1	22.5	7,200	5,400	260	1	28	4,800	4,320
Austenitic Stainless Steel	DS217	100	2	19	1,200	480	100	2	24	800	380
		160	1	19	1,200	480	160	1	24	800	380
		260	1	19	1,000	400	260	1	24	660	320
Titanium Alloy	DS217	100	2	19	800	240	100	2	24	530	190
		160	1	19	800	240	160	1	24	530	190
		260	1	19	600	180	260	1	24	400	140

Note) 1. The figure to be adjusted according to the machine rigidity or work rigidity.
2. In case of catter occurring, recomemended to reduce the depth of cut ap or Spindle speed
3. If machine does not have enough power, recommend to reduce the depth of cut ap or Spindle speed and Feed speed.
4. Use of water soluble cutting oil is recommended.

AERO CHIPPER — ALX/MAL Type

■ Recommended Data for Profile Milling

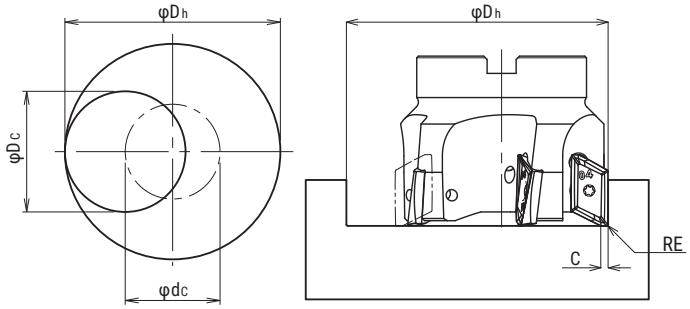
Ramping



Tool dia. (mm)	Alminium		Stainless steel		Titanium alloy		Max. Depth of cut (mm)
	Max. ramping angle (°)	Cutting length (mm)	Max. ramping angle (°)	Cutting length (mm)	Max. ramping angle (°)	Cutting length (mm)	
φDc	θ°	L	θ°	L	θ°	L	ap
20	16	28	10	45	10	45	8
25	11	41	9	51	9	51	8
28	9	51	7	65	7	65	8
30	8	57	6	76	6	76	8
32	7	65	6	76	6	76	8
35	6	76	6	76	6	76	8
40	5	91	5	91	5	91	8
50	4	114	4	114	4	114	8
63	3	153	3	153	3	153	8

Note
1. In case of ramping , apply 70% or less feed (Vf) from standard cutting condition table.
2. When cutting Titanium/Stainless steel, apply 0.005mm or less (fz) from standard cutting condition table.
3. Wet cutting is recommended.

Helical interpolation



- Calculation of tool pass dia.

$$\varphi dc = \varphi Dh - \varphi Dc$$

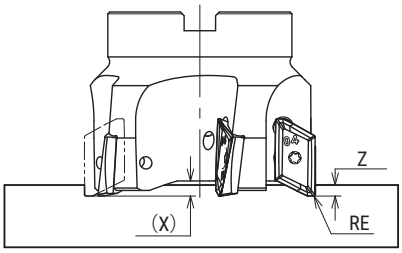
Tool pass dia. Bore dia. Tool dia.

- Depth of cut per one circuit should not exceed max. depth of cut Ap
- Down cutting is recommended, tool pass rotation should be counterclockwise

Tool dia. (mm)	Min.bore dia. (mm)	Max. Bore dia. (mm)	Max.Depth of cut (mm)		
φDc	φDh min.	φDh max.	Alminium	Stainless steel	Titanium alloy
20	35.8	38.6	15	9	9
25	45.8	48.6	13	11	11
28	51.8	54.6	12	10	10
30	55.8	58.6	11	10	10
32	59.8	62.6	11	10	10
35	65.8	68.6	11	11	11
40	75.8	78.6	10	10	10
50	96.8	98.6	10	10	10
63	122.8	124.6	10	10	10

Note
1. In case of helical interpolation , apply 70% or less feed (Vf) from standard cutting condition table.
2. When cutting Titanium/Stainless steel, apply 0.005mm or less (fz) from standard cutting condition table.
3. Wet cutting is recommended.

Drilling



Coner radius R (mm)	Max. depth of cut: Z (mm)
RE	Z
R2.5 or below	3
R3 / R3.2	2
R4	1.5

Note
1. Do not combine drilling and ramping together.
2. In case of drilling , apply 50% or less feed (Vf) from standard cutting condition table.
3. Long chips may come out in case of drilling, confirm safe operating conditions.

■ Recommended Cutting Conditions | Shoulder Milling

● Bore Type

Material	Grade	Tool dia. (mm)									
		50					63				
		4N					5N				
		ℓ (mm)	ap (mm)	ap×ae (mm)	n (mm⁻¹)	Vf (mm/min)	ℓ (mm)	ap (mm)	ap×ae (mm)	n (mm⁻¹)	Vf (mm/min)
Aluminium Alloy 50-110 HB	FZ05	100	15	150	5,700	4,560	100	15	225	4,500	4,500
		150	12	96	5,700	4,560	150	12	168	4,500	4,500
		200	9	54	5,700	4,560	200	9	108	4,500	4,500
Stainless Steel Below 250HB	JC5118	100	10	80	640	260	100	10	120	510	260
		150	8	48	640	260	150	8	88	510	260
		200	6	27	640	260	200	6	54	510	260
Titanium Alloy 35-43 HRC	JC5118	100	15	120	380	120	100	15	180	300	120
		150	12	72	380	120	150	12	132	300	120
		200	9	40	380	120	200	9	81	300	120

● Shank Type

Material	Grade	Tool dia. (mm)									
		20					25/28				
		2N					2N				
		ℓ (mm)	ap (mm)	ap×ae (mm)	n (mm⁻¹)	Vf (mm/min)	ℓ (mm)	ap (mm)	ap×ae (mm)	n (mm⁻¹)	Vf (mm/min)
Aluminium Alloy 50-110 HB	FZ05	35	12	40	14,300	1,430	50	15	75	11,500	4,600
		60	9	25	14,300	1,430	75	12	48	11,500	4,600
Stainless Steel Below 250HB	JC5118	35	2	12	1,590	160	50	10	40	1,270	250
		60	1.2	12	1,590	160	75	8	24	1,270	250
Titanium Alloy 35-43 HRC	JC5118	35	4	12	950	76	50	15	60	760	120
		60	2.5	12	950	76	75	12	36	760	120

Material	Grade	Tool dia. (mm)									
		32/35					40				
		2N					3N				
		ℓ (mm)	ap (mm)	ap×ae (mm)	n (mm⁻¹)	Vf (mm/min)	ℓ (mm)	ap (mm)	ap×ae (mm)	n (mm⁻¹)	Vf (mm/min)
Aluminium Alloy 50-110 HB	FZ05	50	15	120	9,000	3,600	80	15	125	7,200	4,320
		100	12	60	9,000	3,600	120	12	75	7,200	4,320
Stainless Steel Below 250HB	JC5118	50	10	60	990	200	80	10	65	800	240
		100	8	30	990	200	120	8	40	800	240
Titanium Alloy 35-43 HRC	JC5118	50	15	96	600	96	80	15	100	480	120
		100	12	48	600	96	120	12	60	480	120

Note

1. The figure to be adjusted according to the machine rigidity or work rigidity.
2. In case of catter occurring, recomemended to reduce the depth of cut ap or Spindle speed
3. If machine does not have enough power, recommend to reduce the depth of cut ap or Spindle speed and Feed speed.
4. Use of water soluble cutting oil is recommended when machining Aluminium alloy or Titanium alloy.

■ Recommended Cutting Conditions | Shoulder Milling

● Modular Type + MSN Type carbide shank holder

Material	Grade	Tool dia. (mm)									
		20					25/28				
		1N					2N				
		ℓ (mm)	ap (mm)	ap×ae (mm)	*n* (mm^{-1})	*Vf* (mm/min)	ℓ (mm)	ap (mm)	ap×ae (mm)	*n* (mm^{-1})	*Vf* (mm/min)
Aluminium Alloy 50-110 HB	FZ05	60	12	40	14,300	1,430	75	15	75	11,500	4,600
		100	9	18	14,300	1,430	125	12	36	11,500	4,600
		160	5	8	11,500	1,150	200	6	15	9,200	3,680
Stainless Steel Below 250HB	JC5118	60	8	20	1,590	160	75	10	40	1,270	250
		100	6	10	1,590	160	125	8	20	1,270	250
		160	3	4	1,270	130	200	4	8	1,020	200
Titanium Alloy 35-43 HRC	JC5118	60	12	32	950	76	75	15	60	760	120
		100	9	15	950	76	125	12	30	760	120
		160	5	6	760	61	200	6	12	610	98

Material	Grade	Tool dia. (mm)									
		30/32/35					40				
		2N					3N				
		ℓ (mm)	ap (mm)	ap×ae (mm)	*n* (mm^{-1})	*Vf* (mm/min)	ℓ (mm)	ap (mm)	ap×ae (mm)	*n* (mm^{-1})	*Vf* (mm/min)
Aluminium Alloy 50-110 HB	FZ05	100	15	96	9,000	3,600	100	15	120	6,000	3,600
		160	12	48	9,000	3,600	160	12	60	6,000	3,600
		260	6	18	7,200	2,880	260	6	24	4,800	2,880
Stainless Steel Below 250HB	JC5118	100	10	50	990	200	100	10	65	660	200
		160	8	24	990	200	160	8	32	660	200
		260	4	10	800	160	260	4	12	530	160
Titanium Alloy 35-43 HRC	JC5118	100	15	75	600	96	100	15	96	400	96
		160	12	36	600	96	160	12	45	400	96
		260	6	15	480	77	260	6	18	320	77

Note

1. The figure to be adjusted according to the machine rigidity or work rigidity.
2. In case of catter occurring, recomemended to reduce the depth of cut ap or Spindle speed
3. If machine does not have enough power, recommend to reduce the depth of cut ap or Spindle speed and Feed speed.
4. Use of water soluble cutting oil is recommended when machining Aluminium alloy or Titanium alloy.

■ Recommended Cutting Conditions | Face Milling

● Bore Type

Material	Grade	Tool dia. (mm)									
		50					63				
		4N					5N				
		ℓ (mm)	ap (mm)	ae (mm)	*n* (mm^{-1})	*Vf* (mm/min)	ℓ (mm)	ap (mm)	ae (mm)	*n* (mm^{-1})	*Vf* (mm/min)
Aluminium Alloy 50-110 HB	FZ05	100	6	35	5,700	4,560	100	7	44	4,500	4,500
		150	4	35	5,700	4,560	150	5	44	4,500	4,500
		200	2	35	5,700	4,560	200	3	44	4,500	4,500
Stainless Steel Below 250HB	JC5118	100	3	30	640	260	100	4	38	510	260
		150	2	30	640	260	150	2.5	38	510	260
		200	1	30	640	260	200	1.5	38	510	260
Titanium Alloy 35-43 HRC	JC5118	100	6	30	380	120	100	7	38	300	120
		150	4	30	380	120	150	5	38	300	120
		200	2	30	380	120	200	3	38	300	120

● Shank Type

Material	Grade	Tool dia. (mm)									
		20					25/28				
		1N					2N				
		ℓ (mm)	ap (mm)	ae (mm)	*n* (mm^{-1})	*Vf* (mm/min)	ℓ (mm)	ap (mm)	ae (mm)	*n* (mm^{-1})	*Vf* (mm/min)
Aluminium Alloy 50-110 HB	FZ05	35	4	14	14,300	1,430	50	6	17.5	11,500	4,600
		60	2.5	14	14,300	1,430	75	4	17.5	11,500	4,600
Stainless Steel Below 250HB	JC5118	35	2	12	1,590	160	50	3	15	1,270	250
		60	1.2	12	1,590	160	75	2	15	1,270	250
Titanium Alloy 35-43 HRC	JC5118	35	4	12	950	76	50	6	15	760	120
		60	2.5	12	950	76	75	4	15	760	120

Material	Grade	Tool dia. (mm)									
		32/35					40				
		2N					3N				
		ℓ (mm)	ap (mm)	ae (mm)	*n* (mm^{-1})	*Vf* (mm/min)	ℓ (mm)	ap (mm)	ae (mm)	*n* (mm^{-1})	*Vf* (mm/min)
Aluminium Alloy 50-110 HB	FZ05	50	7	22.5	9,000	3,600	80	6	28	7,200	4,320
		100	4	22.5	9,000	3,600	120	4	28	7,200	4,320
Stainless Steel Below 250HB	JC5118	50	4	19	990	200	80	3	24	800	240
		100	2	19	990	200	120	2	24	800	240
Titanium Alloy 35-43 HRC	JC5118	50	7	19	600	96	80	6	24	480	120
		100	4	19	600	96	120	4	24	480	120

Note

1. The figure to be adjusted according to the machine rigidity or work rigidity.
2. In case of catter occurring, recomemended to reduce the depth of cut ap or Spindle speed
3. If machine does not have enough power, recommend to reduce the depth of cut ap or Spindle speed and Feed speed.
4. Use of water soluble cutting oil is recommended when machining Aluminium alloy or Titanium alloy.

AERO CHIPPER ALX/MAL Type

■ Recommended Cutting Conditions | Face Milling

● Modular Type + MSN Type carbide shank holder

Material	Grade	Tool dia. (mm)									
		20					25/28				
		1N					2N				
		ℓ (mm)	ap (mm)	ae (mm)	n (mm⁻¹)	Vf (mm/min)	ℓ (mm)	ap (mm)	ae (mm)	n (mm⁻¹)	Vf (mm/min)
Aluminium Alloy 50-110 HB	FZ05	60	4	14	14,300	1,430	75	6	17.5	11,500	4,600
		100	2	14	14,300	1,430	125	3	17.5	11,500	4,600
		160	0.8	14	11,500	1,150	200	1.2	17.5	9,200	3,680
Stainless Steel Below 250HB	JC5118	60	2	12	1,590	160	75	3	15	1,270	250
		100	1	12	1,590	160	125	1.5	15	1,270	250
		160	0.5	12	1,270	130	200	0.6	15	1,020	200
Titanium Alloy 35-43 HRC	JC5118	60	4	12	950	76	75	6	15	760	120
		100	2	12	950	76	125	3	15	760	120
		160	0.8	12	760	61	200	1.2	15	610	98

Material	Grade	Tool dia. (mm)									
		30/32/35					40				
		2N					3N				
		ℓ (mm)	ap (mm)	ae (mm)	n (mm⁻¹)	Vf (mm/min)	ℓ (mm)	ap (mm)	ae (mm)	n (mm⁻¹)	Vf (mm/min)
Aluminium Alloy 50-110 HB	FZ05	100	6	22.5	9,000	3,600	100	6	28	6,000	3,600
		160	3	22.5	9,000	3,600	160	3	28	6,000	3,600
		260	1.2	22.5	7,200	2,880	260	1.2	28	4,800	2,880
Stainless Steel Below 250HB	JC5118	100	3	19	990	200	100	3	24	660	200
		160	1.5	19	990	200	160	1.5	24	660	200
		260	0.6	19	800	160	260	0.6	24	530	160
Titanium Alloy 35-43 HRC	JC5118	100	6	19	600	96	100	6	24	400	96
		160	3	19	600	96	160	3	24	400	96
		260	1.2	19	480	77	260	1.2	24	320	77

Note

1. The figure to be adjusted according to the machine rigidity or work rigidity.
2. In case of catter occurring, recomemended to reduce the depth of cut ap or Spindle speed
3. If machine does not have enough power, recommend to reduce the depth of cut ap or Spindle speed and Feed speed.
4. Use of water soluble cutting oil is recommended when machining Aluminium alloy or Titanium alloy.

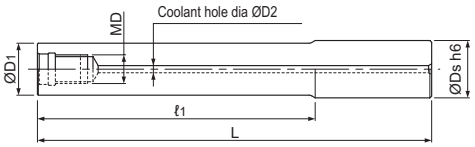
Carbide Modular Head Holder — MSN Type

C-Body

Through coolant hole

MSN TYPE Solid Monoblock Carbide Body





Cat.No.	Stock	Dimensions(mm)						Weight (kg)
		øDs	ℓ1	L	øD1	MD	øD2	
MSN-M6-12-S10C	●	10	12	60	9.7	M6	3	0.06
MSN-M6-30-S10C	●	10	30	80	9.7	M6	3	0.07
MSN-M6-50-S10C	●	10	50	100	9.7	M6	3	0.09
MSN-M6-80-S10C	●	10	80	130	9.7	M6	3	0.12
MSN-M6-120-S10C	●	10	120	170	9.7	M6	3	0.16
MSN-M6-170-S10C ※	●	10	170	220	9.7	M6	3	0.20
MSN-M6-15-S12C	●	12	15	60	11.5	M6	3	0.08
MSN-M6-30-S12C	●	12	30	80	11.5	M6	3	0.11
MSN-M6-50-S12C	●	12	50	100	11.5	M6	3	0.13
MSN-M6-80-S12C	●	12	80	130	11.5	M6	3	0.18
MSN-M6-120-S12C	●	12	120	170	11.5	M6	3	0.23
MSN-M6-170-S12C ※	●	12	170	220	11.5	M6	3	0.30
MSN-M6-30-S16C	●	16	30	80	13.5	M6	3	0.19
MSN-M6-50-S16C	○	16	50	100	13.5	M6	3	0.23
MSN-M6-80-S16C	●	16	80	130	13.5	M6	3	0.28
MSN-M8-20-S16C	●	16	20	75	15.5	M8	4	0.17
MSN-M8-40-S16C	●	16	40	95	15.5	M8	4	0.22
MSN-M8-60-S16C	●	16	60	115	15.5	M8	4	0.28
MSN-M8-80-S16C	●	16	80	135	15.5	M8	4	0.32
MSN-M8-120-S16C	●	16	120	175	15.5	M8	4	0.42
MSN-M8-152-S16C	●	16	152	207	15.5	M8	4	0.51
MSN-M10-20-S20C	●	20	20	80	19.5	M10	4	0.29
MSN-M10-40-S20C	●	20	40	100	19.5	M10	4	0.39
MSN-M10-70-S20C	●	20	70	130	19.5	M10	4	0.50
MSN-M10-90-S20C	●	20	90	150	19.5	M10	4	0.60
MSN-M10-140-S20C	●	20	140	200	19.5	M10	4	0.80
MSN-M10-160-S20C	●	20	160	220	19.5	M10	4	0.87
MSN-M10-210-S20C	●	20	210	270	19.5	M10	4	1.07

※ "MSN-M6-170-S10C" and "MSN-M6-170-S12C" are for high-feed cutting only.

Carbide Modular Head Holder — MSN Type

C-Body | Through coolant hole

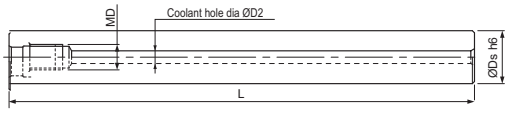
Cat.No.	Stock	Dimensions(mm)						Weight (kg)
		øDs	ℓ1	L	øD1	MD	øD2	
MSN-M12-25-S25C	●	25	25	90	24	M12	6	0.53
MSN-M12-55-S25C	●	25	55	120	24	M12	6	0.72
MSN-M12-70-S25C	●	25	70	135	24	M12	6	0.81
MSN-M12-105-S25C	●	25	105	170	24	M12	6	1.03
MSN-M12-135-S25C	●	25	135	215	24	M12	6	1.30
MSN-M12-155-S25C	●	25	155	220	24	M12	6	1.34
MSN-M12-200-S25C	●	25	200	265	24	M12	6	1.58
MSN-M12-255-S25C	●	25	255	320	24	M12	6	1.91
MSN-M16-25-S32C	●	32	25	90	29	M16	8	0.85
MSN-M16-55-S32C	●	32	55	120	29	M16	8	1.13
MSN-M16-77-S32C	●	32	77	157	29	M16	8	1.47
MSN-M16-97-S32C	●	32	97	177	29	M16	8	1.64
MSN-M16-105-S32C	●	32	105	170	29	M16	8	1.59
MSN-M16-127-S32C	●	32	127	207	29	M16	8	1.89
MSN-M16-155-S32C	●	32	155	220	29	M16	8	2.04
MSN-M16-177-S32C	●	32	177	257	29	M16	8	2.32
MSN-M16-195-S32C	●	32	195	260	29	M16	8	2.40
MSN-M16-225-S32C	●	32	225	290	29	M16	8	2.57
MSN-M16-245-S32C	●	32	245	310	29	M16	8	2.74
MSN-M16-295-S32C	●	32	295	360	29	M16	8	3.17
MSN-M16-315-S32C	●	32	315	380	29	M16	8	3.34

Carbide Modular Head Holder — MSN Type

C-Body | Through coolant hole

MSN-S TYPE — Solid Monoblock Carbide Body





Cat.No.	Stock	Dimensions(mm)				Weight (kg)
		øDs	L	MD	øD2	
MSN-M6-67S-S9.8C	●	9.8	67	M6	3	0.06
MSN-M6-107S-S9.8C	●	9.8	107	M6	3	0.10
MSN-M6-82S-S10C	●	10	82	M6	3	0.08
MSN-M6-122S-S10C	●	10	122	M6	3	0.12
MSN-M6-167S-S10C	●	10	167	M6	3	0.16
MSN-M6-220S-S10C ※	●	10	220	M6	3	0.21
MSN-M6-80S-S11.8C	●	11.8	80	M6	3	0.11
MSN-M6-120S-S11.8C	●	11.8	120	M6	3	0.17
MSN-M6-90S-S12C	●	12	90	M6	3	0.13
MSN-M6-130S-S12C	●	12	130	M6	3	0.19
MSN-M6-170S-S12C	●	12	170	M6	3	0.25
MSN-M6-220S-S12C ※	●	12	220	M6	3	0.32
MSN-M8-87S-S14C	○	14	87	M8	4	0.16
MSN-M8-137S-S14C	●	14	137	M8	4	0.26
MSN-M8-97S-S15C	●	15	97	M8	4	0.21
MSN-M8-147S-S15C	●	15	147	M8	4	0.33
MSN-M8-197S-S15C	●	15	197	M8	4	0.44
MSN-M8-217S-S15C	●	15	217	M8	4	0.49
MSN-M8-107S-S16C	●	16	107	M8	4	0.27
MSN-M8-157S-S16C	●	16	157	M8	4	0.40
MSN-M8-220S-S16C	●	16	220	M8	4	0.57
MSN-M10-130S-S18C	●	18	130	M10	4	0.42
MSN-M10-190S-S18C	●	18	190	M10	4	0.62
MSN-M10-240S-S18C	●	18	240	M10	4	0.89
MSN-M10-270S-S18C	●	18	270	M10	4	0.90
MSN-M10-130S-S20C	●	20	130	M10	4	0.53
MSN-M10-190S-S20C	●	20	190	M10	4	0.78
MSN-M10-250S-S20C	●	20	250	M10	4	1.02
MSN-M10-270S-S20C	●	20	270	M10	4	1.13

※ "MSN-M6-220S-S10C" and "MSN-M6-220S-S12C" are for high-feed cutting only.

Carbide Modular Head Holder — MSN Type

C-Body

Through coolant hole

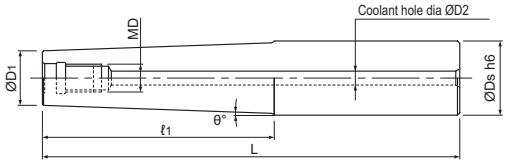
Cat.No.	Stock	Dimensions(mm)				Weight (kg)
		øDs	L	MD	øD2	
MSN-M12-145S-S23C	○	23	145	M12	6	0.76
MSN-M12-185S-S23C	●	23	185	M12	6	0.98
MSN-M12-265S-S23C	●	23	265	M12	6	1.42
MSN-M12-185S-S24C	●	24	185	M12	6	1.07
MSN-M12-265S-S24C	●	24	265	M12	6	1.54
MSN-M12-320S-S24C	●	24	320	M12	6	1.85
MSN-M12-145S-S25C	●	25	145	M12	6	0.91
MSN-M12-215S-S25C	●	25	215	M12	6	1.36
MSN-M12-285S-S25C	●	25	285	M12	6	1.80
MSN-M12-320S-S25C	●	25	320	M12	6	2.06
MSN-M16-160S-S28C	●	28	160	M16	8	1.22
MSN-M16-230S-S28C	●	28	230	M16	8	1.77
MSN-M16-310S-S28C	●	28	310	M16	8	2.41
MSN-M16-157S-S32C	●	32	157	M16	8	1.61
MSN-M16-217S-S32C	●	32	217	M16	8	2.22
MSN-M16-287S-S32C	●	32	287	M16	8	2.94
MSN-M16-357S-S32C	●	32	357	M16	8	3.66
MSN-M16-380S-S32C	●	32	380	M16	8	3.98

Carbide Modular Head Holder — MSN Type

C-Body

Through coolant hole

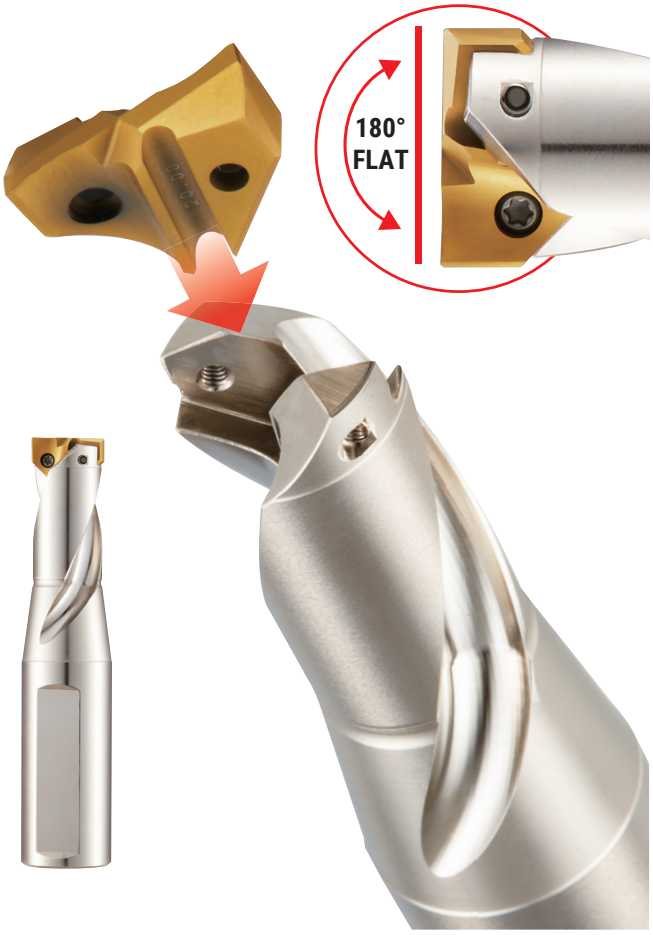
MSN-T TYPE — Solid Monoblock Carbide Body



Cat.No.	Stock	Dimensions(mm)							Weight (kg)
		øDs	ℓ1	L	øD1	θ°	MD	øD2	
MSN-M6-35T-S12C	○	12	35	92	9.5	1°30'	M6	3	0.12
MSN-M6-57T-S12C	●	12	57	114	9.5	1°	M6	3	0.14
MSN-M6-65T-S16C	●	16	65	125	11.2	1°45'	M6	3	0.28
MSN-M8-40T-S20C	○	20	40	100	14.5	3°30'	M8	4	0.36
MSN-M8-77T-S20C	●	20	77	143	14.5	1°45'	M8	4	0.49
MSN-M8-90T-S25C	○	25	90	165	14.5	2°	M8	4	0.81
MSN-M10-40T-S20C	●	20	40	100	18.5	0°43'	M10	4	0.39
MSN-M10-90T-S20C	●	20	90	150	18.5	0°19'	M10	4	0.58
MSN-M10-140T-S20C	●	20	140	200	18.5	0°12'	M10	4	0.77
MSN-M10-115T-S32C	○	32	115	195	18.5	2°	M10	4	1.54
MSN-M12-100T-S32C	○	32	100	180	23.5	2°	M12	6	1.61
MSN-M16-117T-S32C	○	32	117	197	29	0°38'	M16	8	1.88
MSN-M16-127T-S32C	○	32	127	207	29	0°30'	M16	8	2.23
MSN-M16-177T-S32C	●	32	177	257	29	0°23'	M16	8	2.78
MSN-M16-197T-S32C	○	32	197	277	29	0°23'	M16	8	3.00

INDEXABLE FLAT DRILL — TLZD Type

Through coolant hole | JC7500 Coating | Spot Facing | Drilling



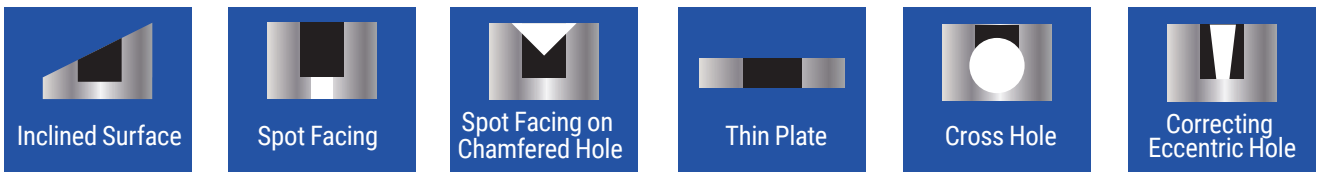
- 180°Flat face
- Able to drill without pilot hole, even on sloped surfaces & cross holes



■ Features

1. Easy tool management
2. Able to drill without pilot hole, even on sloped surfaces and cross holes.
3. Long tool life by adopting new grade JC7550 and improved coolant distribution system.
4. The most suitable for burr-less processing.

■ Applications



INDEXABLE FLAT DRILL — TLZD Type

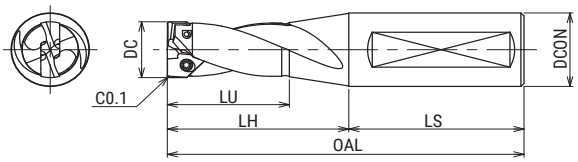
Through coolant hole | JC7500 Coating | Spot Facing | Drilling

TLZD TYPE — Holder

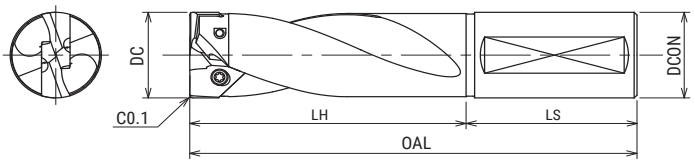
● Depth of hole: 1.5×Dc



DC≦φ30



DC＞φ30



Cat.No.	Stock	DC		Dimensions (mm)					Parts	
		Min.	Max.	LU	LH	LS	OAL	DCON	Screw	Wrench
TLZD1400S16-SS	●	14.0	14.5	29	43	48	91	16	DSW-2045H	A-07
TLZD1500S20-SS	●	14.6	15.5	31	46	50	96	20		
TLZD1600S20-SS	●	15.6	16.5	33	49	50	99	20	TSW-2556H	A-08
TLZD1700S20-SS	●	16.6	17.5	35	52	50	102	20		
TLZD1800S20-SS	●	17.6	18.5	37	55	50	105	20		
TLZD1900S25-SS	●	18.6	19.5	39	58	56	114	25	TSW-2567H	A-08
TLZD2000S25-SS	●	19.6	20.5	41	61	56	117	25		
TLZD2100S25-SS	●	21.0	21.5	43	64	56	120	25		
TLZD2200S25-SS	●	22.0	22.5	45	67	56	123	25	DSW-307H	A-10
TLZD2300S25-SS	●	23.0	23.5	47	70	56	126	25		
TLZD2400S32-SS	●	24.0	24.5	49	73	60	133	32		
TLZD2500S32-SS	●	25.0	25.5	51	76	60	136	32	DSW-309H	A-10
TLZD2600S32-SS	●	26.0	26.5	53	79	60	139	32		
TLZD2700S32-SS	●	27.0	27.5	55	82	60	142	32		
TLZD2800S32-SS	●	28.0	28.5	57	85	60	145	32	TSW-3510H	A-15
TLZD2900S32-SS	●	29.0	29.5	59	88	60	148	32		
TLZD3000S32-SS	●	30.0	30.5	61	91	60	151	32		
TLZD3100S32-SS	●	31.0	31.5	–	94	60	154	32	TSW-3512H	A-15
TLZD3200S32-SS	●	32.0	-	–	97	60	157	32		

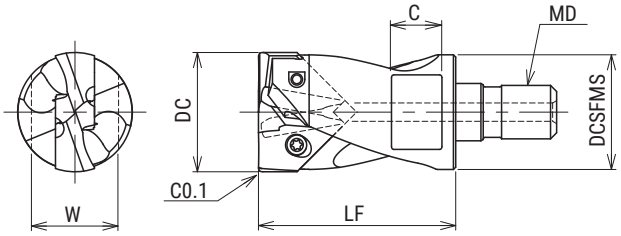
Through coolant hole | JC7500 Coating | Spot Facing | Drilling

TLZD TYPE

Modular Type

● Depth of hole 0.7～1×Dc





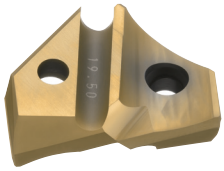
Cat.No.	Stock	DC		Dimensions (mm)					Parts		MSN Carbide Shank
		Min.	Max.	LF	DCSFMS	MD	C	W	Screw	Wrench	
TLZD1400-M6	●	14.0	14.5	27.5	13.1	M6	7	10	DSW-2045H	A-07	MSN-M6-**-S16C
TLZD1500-M8	●	14.6	15.5	29.5	14	M8	8	12			MSN-M8-**S-S14C
TLZD1600-M8	●	15.6	16.5	29.5	15	M8	8	12	TSW-2556H	A-08	MSN-M8-**S-S15C
TLZD1700-M8	●	16.6	17.5	30.5	16	M8	8	12			MSN-M8-**S-S16C
TLZD1800-M8	●	17.6	18.5	30.5	17	M8	8	12			MSN-M8-**S-S16C
TLZD1900-M10	●	18.6	19.5	38.5	18	M10	9	14	TSW-2567H	A-08	MSN-M10-**-S18C
TLZD2000-M10	●	19.6	20.5	38.5	19	M10	9	14			MSN-M10-**-S20C
TLZD2100-M10	●	21.0	21.5	38.5	20	M10	9	14			MSN-M10-**S-S20C
TLZD2200-M10	●	22.0	22.5	38.5	21	M10	9	14	DSW-307H	A-10	MSN-M10-**S-S20C
TLZD2300-M10	●	23.0	23.5	38.5	22	M10	9	14			MSN-M10-**S-S20C
TLZD2400-M12	●	24.0	24.5	43	23	M12	11	19			MSN-M12-**S-S23C
TLZD2500-M12	●	25.0	25.5	43	24	M12	11	19	DSW-309H	A-10	MSN-M12-**-S25C
TLZD2600-M12	●	26.0	26.5	43	25	M12	11	19			MSN-M12-**S-S25C
TLZD2700-M12	●	27.0	27.5	43	26	M12	11	19			MSN-M12-**S-S25C
TLZD2800-M12	●	28.0	28.5	43	27	M12	11	19	TSW-3510H	A-15	MSN-M12-**S-S25C
TLZD2900-M16	●	29.0	29.5	51	28	M16	12	22			MSN-M16-**S-S28C
TLZD3000-M16	●	30.0	30.5	51	29	M16	12	22			MSN-M16-**-S32C
TLZD3100-M16	●	31.0	31.5	51	30	M16	12	22	TSW-3512H	A-15	MSN-M16-**-S32C
TLZD3200-M16	●	32.0	-	51	31	M16	14	26			MSN-M16-**-S32C

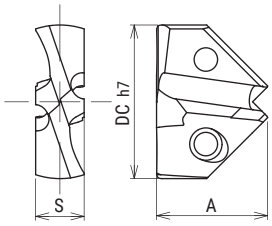
Screw	Torque (N.m)
DSW-2045H	0.9
TSW-2556H	1.2
TSW-2567H	1.2
DSW-307H	2.1
DSW-309H	2.1
TSW-3510H	3.0
TSW-3512H	3.0

INDEXABLE FLAT DRILL — TLZD Type

Through coolant hole | JC7500 Coating | Spot Facing | Drilling

TLZ TYPE — **Insert - Grade JC7550**





DC	Cat.No.	Stk	A	S	Holder
14.0	TLZ1400	●	10.6	4.5	TLZD14*
14.1	TLZ1410	●			
14.2	TLZ1420	●			
14.3	TLZ1430	●			
14.4	TLZ1440	●			
14.5	TLZ1450	●			
14.6	TLZ1460	●	11.3	4.8	TLZD15*
14.7	TLZ1470	●			
14.8	TLZ1480	●			
14.9	TLZ1490	●			
15.0	TLZ1500	●			
15.1	TLZ1510	●			
15.2	TLZ1520	●			
15.3	TLZ1530	●			
15.4	TLZ1540	●			
15.5	TLZ1550	●			
15.6	TLZ1560	●	12.1	5.0	TLZD16*
15.7	TLZ1570	●			
15.8	TLZ1580	●			
15.9	TLZ1590	●			
16.0	TLZ1600	●			
16.1	TLZ1610	●			
16.2	TLZ1620	●			
16.3	TLZ1630	●			
16.4	TLZ1640	●			
16.5	TLZ1650	●			
16.6	TLZ1660	●	12.6	5.5	TLZD17*
16.7	TLZ1670	●			
16.8	TLZ1680	●			
16.9	TLZ1690	●			
17.0	TLZ1700	●			
17.1	TLZ1710	●			
17.2	TLZ1720	●			
17.3	TLZ1730	●			
17.4	TLZ1740	●			
17.5	TLZ1750	●			
17.6	TLZ1760	●	13.2	5.8	TLZD18*
17.7	TLZ1770	●			
17.8	TLZ1780	●			
17.9	TLZ1790	●			
18.0	TLZ1800	●			
18.1	TLZ1810	●			
18.2	TLZ1820	●			

DC	Cat.No.	Stk	A	S	Holder
18.3	TLZ1830	●	13.2	5.8	TLZD18*
18.4	TLZ1840	●			
18.5	TLZ1850	●			
18.6	TLZ1860	●	13.6	6.0	TLZD19*
18.7	TLZ1870	●			
18.8	TLZ1880	●			
18.9	TLZ1890	●			
19.0	TLZ1900	●			
19.1	TLZ1910	●			
19.2	TLZ1920	●			
19.3	TLZ1930	●			
19.4	TLZ1940	●			
19.5	TLZ1950	●			
19.6	TLZ1960	●	14.6	6.5	TLZD20*
19.7	TLZ1970	●			
19.8	TLZ1980	●			
19.9	TLZ1990	●			
20.0	TLZ2000	●			
20.5	TLZ2050	●			
21.0	TLZ2100	●	15.2	6.7	TLZD21*
21.5	TLZ2150	●			
22.0	TLZ2200	●	15.9	7.5	TLZD22*
22.5	TLZ2250	●			
23.0	TLZ2300	●	16.7	7.5	TLZD23*
23.5	TLZ2350	●			
24.0	TLZ2400	●	17.4	8.0	TLZD24*
24.5	TLZ2450	●			
25.0	TLZ2500	●	18.3	8.0	TLZD25*
25.5	TLZ2550	●			
26.0	TLZ2600	●	18.8	8.5	TLZD26*
26.5	TLZ2650	●			
27.0	TLZ2700	●	19.5	8.5	TLZD27*
27.5	TLZ2750	●			
28.0	TLZ2800	●	20.3	9.0	TLZD28*
28.5	TLZ2850	●			
29.0	TLZ2900	●	21.1	9.0	TLZD29*
29.5	TLZ2950	●			
30.0	TLZ3000	●	21.5	9.5	TLZD30*
30.5	TLZ3050	●			
31.0	TLZ3100	●	22.3	10.0	TLZD31*
31.5	TLZ3150	●			
32.0	TLZ3200	●	23.1	10.0	TLZD32*

■Recommended Cutting Conditions

●TLZD-SS type

Material	Mild Steel below 180HB	Carbon Steel below 280HB	Tool Steel below 255HB	Alloy Steel 280-350HB
Vc (m/min)	50 - 70 - 100	50 - 70 - 100	30 - 50 - 70	30 - 50 -70
f (mm/rev)	0.06 - 0.20 (Dc14-16) 0.07 - 0.21 (Dc17-20) 0.08 - 0.22 (Dc21-25) 0.09 - 0.23 (Dc26-29) 0.10 - 0.24 (Dc30-32)	0.06 - 0.20 (Dc14-16) 0.07 - 0.21 (Dc17-20) 0.08 - 0.22 (Dc21-25) 0.09 - 0.23 (Dc26-29) 0.10 - 0.24 (Dc30-32)	0.06 - 0.20 (Dc14-16) 0.07 - 0.21 (Dc17-20) 0.08 - 0.22 (Dc21-25) 0.09 - 0.23 (Dc26-29) 0.10 - 0.24 (Dc30-32)	0.06 - 0.20 (Dc14-16) 0.07 - 0.21 (Dc17-20) 0.08 - 0.22 (Dc21-25) 0.09 - 0.23 (Dc26-29) 0.10 - 0.24 (Dc30-32)

Material	Mold Steel below 40HRC	Cast Iron	Stainless Steel	Aluminium Alloy
Vc (m/min)	20 - 30 - 40	50 - 70 - 100	80 - 100 - 120 - 140	50 - 100 - 150
f (mm/rev)	0.04 - 0.10 (Dc14-16) 0.04 - 0.11 (Dc17-18) 0.05 - 0.11 (Dc19-20) 0.05 - 0.12 (Dc21-25) 0.05 - 0.13 (Dc26-27) 0.06 - 0.13 (Dc28-29) 0.06 - 0.14 (Dc30-32)	0.06 - 0.20 (Dc14-16) 0.07 - 0.21 (Dc17-20) 0.08 - 0.22 (Dc21-25) 0.09 - 0.23 (Dc26-29) 0.10 - 0.24 (Dc30-32)	0.02 - 0.06 (Dc14-18) 0.03 - 0.07 (Dc19-25) 0.04 - 0.08 (Dc26-31) 0.05 - 0.09 (Dc32)	0.06 - 0.20 (Dc14-16) 0.07 - 0.21 (Dc17-20) 0.08 - 0.22 (Dc21-25) 0.09 - 0.23 (Dc26-29) 0.10 - 0.24 (Dc30-32)

Note

1. These cutting conditions are for drilling flat surface. when drilling angled surfaces, parameters should be adjusted. For inclined angle under 30°, apply 40-80% of (Vf) and for inclined angle 30° or more , apply 20-50% of (Vf) from standard cutting conditions.
2. These cutting conditions are for drilling with water soluble coolant. when dry cutting , use air to remove chips.
3. Drilling depth over 1.5 x Dc is not recommended.
4. Side milling is not possible.
5. In case of long chips , adjust parameters by increasing (Vf) or using step feed for breaking chips.

INDEXABLE FLAT DRILL — TLZD Type

■Recommended Cutting Conditions

●TLZD-***-M** Modular Head type

Material	Mild Steel below 180HB	Carbon Steel below 280HB	Tool Steel below 255HB	Alloy Steel 280-350HB
Vc (m/min)	70	70	70	70
f (mm/rev)	0.04 - 0.06 (Dc14) 0.04 - 0.08 (Dc15-18) 0.04 - 0.09 (Dc19-23) 0.06 - 0.12 (Dc24-28) 0.06 - 0.14 (Dc29-32)	0.04 - 0.06 (Dc14) 0.04 - 0.08 (Dc15-18) 0.04 - 0.09 (Dc19-23) 0.06 - 0.12 (Dc24-28) 0.06 - 0.14 (Dc29-32)	0.03 - 0.05 (Dc14) 0.03 - 0.06 (Dc15-18) 0.04 - 0.07 (Dc19-23) 0.05 - 0.09 (Dc24-28) 0.06 - 0.11 (Dc29-32)	0.03 - 0.05 (Dc14) 0.03 - 0.06 (Dc15-18) 0.04 - 0.07 (Dc19-23) 0.05 - 0.09 (Dc24-28) 0.06 - 0.11 (Dc29-32)

Material	Mold Steel below 40HRC	Cast Iron	Stainless Steel	Aluminium Alloy
Vc (m/min)	40	100	100	100
f (mm/rev)	0.02 - 0.06 (Dc14) 0.03 - 0.07 (Dc15-18) 0.03 - 0.08 (Dc19-23) 0.04 - 0.10 (Dc24-28) 0.05 - 0.13 (Dc29-32)	0.02 - 0.07 (Dc14) 0.04 - 0.09 (Dc15-18) 0.02 - 0.10 (Dc19-23) 0.02 - 0.12 (Dc24-28) 0.02 - 0.13 (Dc29-32)	0.02 - 0.04 (Dc14-23) 0.03 - 0.04 (Dc24-32)	0.02 - 0.07 (Dc14) 0.04 - 0.09 (Dc15-18) 0.02 - 0.10 (Dc19-23) 0.02 - 0.12 (Dc24-28) 0.02 - 0.13 (Dc29-32)

Note

1. These cutting conditions are for drilling flat surface. when drilling angled surfaces, parameters should be adjusted. for inclined angle under 30°, apply 40-80% of (Vf) and for inclined angle 30° or more , apply 20-50% of (Vf) from standard cutting conditions.
2. These cutting conditions are for drilling with water soluble coolant. when dry cutting , use air to remove chips.
3. Drilling depth over 1.0 x Dc is not recommended.
4. Side milling is not possible.
5. In case of long chips , adjust parameters by increasing (Vf) or using step feed for breaking chips. when drilling stainless steel, increasing (Vf) is not recommended to break chips. Increase (Vc) and reduce (Vf) so that bellows-shaped chips can occur.

PROCEDURE FOR MOUNTING INSERT

1. Removing used insert

Make sure to remove any chips or dust off the tip before removing the used insert. Remove used insert and clean pocket using a brush or air blowing before loading new insert.

2. Loading new insert

Place new insert in pocket, lightly tighten two screws while pressing the top of the insert (see photo). After confirming there is no gap between the drill and insert, tighten the insert screw, starting with the same screw you first lightly tightened, to the recommended torque while still pressing the top pf the insert.





"MOLY"
(Sold separately)

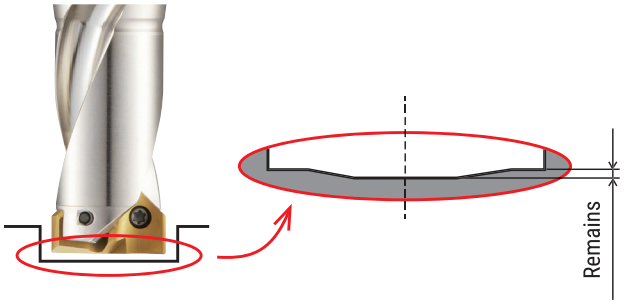
⚠ Note:

Clamp screw needs to be changed out after replacing the insert approximately 10 times or if you see any issues with the screws.



Clamp screw

■ HOLE BOTTOM SHAPE



Tool dia. (mm)	Remains (mm)
φ14~φ20.5	0.04~0.06
φ21~φ26.5	0.05~0.07
φ27~φ32.0	0.06~0.08

Feature 1 Drill Body Variations

L/D=3
Φ13.5 - 32.5



L/D=5
Φ13.5 - 32.5



L/D=8
Φ13.5 - 32.5



NEW **L/D=12**
Φ13.5 - 22.5



Modular Head
L/D=2D
Φ13.5 - 32.5

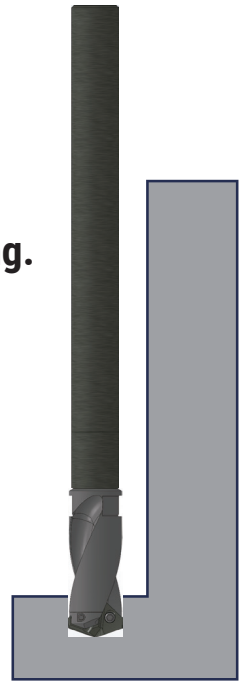




carbide modular head holder MSN type

TEZD-M (Modular head) type

The combination of a modular head and a carbide shank holder enables stable drilling even with a long overhang.

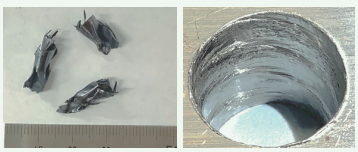




TEZDF type

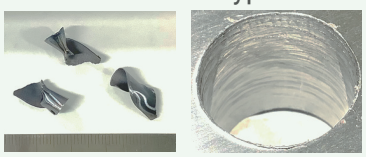
A high-rigidity flanged shank body enables stable and accurate hole making.

Conventional model



Hole Dia : Φ17.013

TEZDF-ML type



Hole Dia : Φ17.005

Improved chip formation and hole accuracy!

P

dia	: Φ17
tool	: TEZD1700S20F-ML
material	: SS400
Vc	: 75 m/min
f	: 0.15 mm/rev

Feature 2 Available in three insert types

TEZ type - General purpose

P M K

Φ13.5 - 32.5

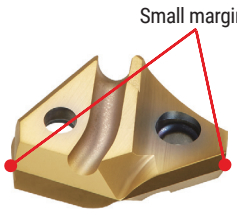


- PVD coating grade "JC8050"
- Suitable for all types of materials.

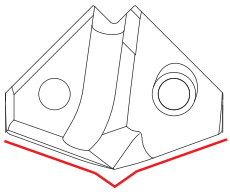
TEZ-S type - For Stainless Steel, Titanium Alloy

M S

Φ13.5 - 20.5

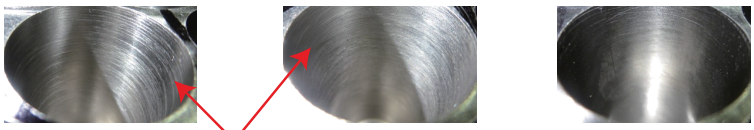


- PVD coating grade "JC7515"
  (for high thermal crack resistance & oxidation resistance)
- "Small margins" reduce cutting heat generated.
- "Improved Centripetal centering" geometry
  for Smooth drilling and Good chip evacuation.



Centripetal centering geometry

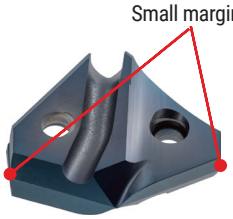
Competitor C for heat-resistant alloy	TEZ type for heat-resistant alloy	TEZ-S type for heat-resistant alloy



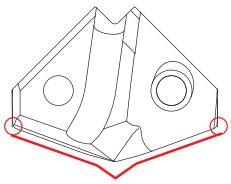
TEZ-H type - For Mold Steel, Hardened Steel (up to 52 HRC)

H

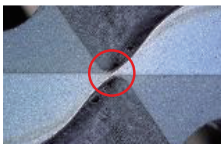
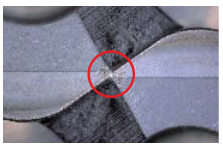
Φ13.5 - 20.5



- PVD coating grade "DH115"
  (for high hardness & heat resistance)
- "Small margins" reduce cutting heat generated.
- "Optimized Tip and Corner geometry" specially for hardened materials.
- "Strong Drill Corner Edge" prevents chipping.



Optimized Tip and Corner geometry
specially for hardened materials

TEZ-H type		
Competitor		

dia : Φ 16
insert : TEZ-1600H
grade : DH115
material : NAK80(40HRC)
Vc : 50 m/min
f : 0.2 mm/rev

INDEXABLE DRILL — TEZD Type

PROCEDURE FOR MOUNTING INSERT

1. Removing used insert

Make sure to remove any chips or dust off the tip before removing the used insert. Remove used insert and clean pocket using a brush or air blowing before loading new insert.





2. Loading new insert

Place new insert in pocket, lightly tighten two screws while pressing the top of the insert(see photo). After confirming there is no gap between the drill and insert, tighten the insert screw, starting with the same screw you first lightly tightened, to the recommended torque while still pressing the top pf the insert.



⚠ Note:

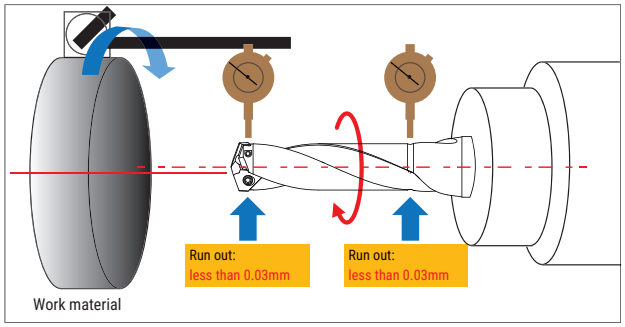
Clamp screw need to be changed out after replacing the insert approximately 10 times or if you see any issues with the screws.



Clamp screw

IF USING LATHE MACHINE

1. Check run out of insert O.D. within 0.03mm (off set of center 0.015mm) and flute O.D. of shank side within approx. 0.03mm.
2. Due to large thrust of cutting forces, make sure drill is fully seated in holder.
3. Reduce the cutting speed and feed rate by 20% from standard cutting conditions.



INDEXABLE DRILL — TEZD Type

Through coolant hole | 2D L/D | Drilling

TEZD-M TYPE — Modular Type



Fig.1

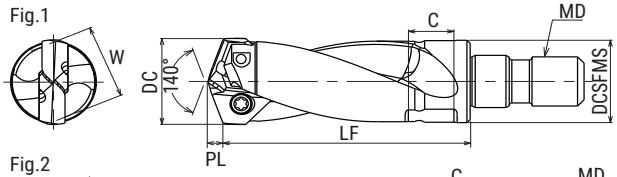
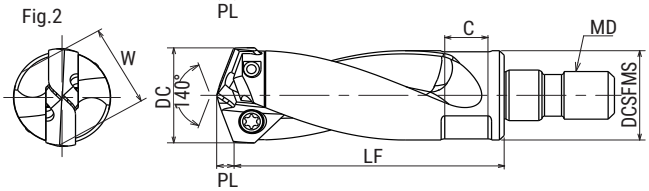


Fig.2



Cat.No.	Stock	DC		Dimensions (mm)						Fig.	Parts	
		Min.	Max.	LF	PL	DCSFMS	MD	C	W		Screw	Wrench
TEZD1400-M8	●	13.5	14.5	38	2.3	13.4	M8	8	12	1	DSW-2045H	A-07
TEZD1500-M8	●	14.6	15.5	40.5	2.4	14	M8	8	12	2		
TEZD1600-M8	●	15.6	16.5	43	2.6	15	M8	8	12	2	TSW-2556H	A-08
TEZD1700-M8	●	16.6	17.5	45.5	2.7	16	M8	8	12	2		
TEZD1800-M8	●	17.6	18.5	48	2.9	17	M8	8	12	2		
TEZD1900-M10	●	18.6	19.5	50.5	3.1	18	M10	9	14	2	TSW-2567H	A-08
TEZD2000-M10	●	19.6	20.5	53	3.2	19	M10	9	14	2		
TEZD2100-M10	●	20.6	21.5	55.5	3.4	20	M10	9	14	2		
TEZD2200-M10	●	21.6	22.5	58	3.5	21	M10	9	14	2	DSW-307H	A-10
TEZD2300-M10	●	22.6	23.5	60.5	3.7	22	M10	9	14	2		
TEZD2400-M12	●	23.6	24.5	63	3.9	23	M12	11	19	2		
TEZD2500-M12	●	24.6	25.5	65.5	4.0	24	M12	11	19	2	DSW-309H	A-10
TEZD2600-M12	●	25.6	26.5	68	4.2	25	M12	11	19	2		
TEZD2700-M12	●	26.6	27.5	70.5	4.4	26	M12	11	19	2		
TEZD2800-M12	●	27.6	28.5	73	4.5	27	M12	11	19	2	TSW-3510H	A-15
TEZD2900-M16	●	28.6	29.5	75.5	4.7	28	M16	12	22	2		
TEZD3000-M16	●	29.6	30.5	78	4.8	29	M16	12	22	2		
TEZD3100-M16	●	30.6	31.5	80.5	5.0	30	M16	12	22	2	TSW-3512H	A-15
TEZD3200-M16	●	31.6	32.5	83	5.2	31	M16	14	26	2		

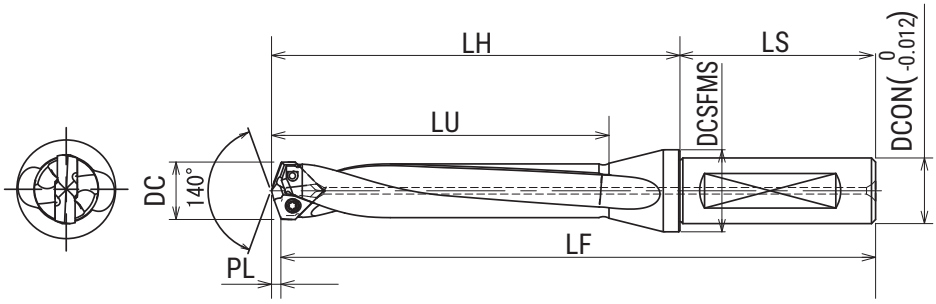
Clamp screw	Torque(N·m)
DSW-2045H	0.9
TSW-2556H	1.2
TSW-2567H	1.2
DSW-307H	2.1
DSW-309H	2.1
TSW-3510H	3.0
TSW-3512H	3.0

INDEXABLE DRILL — TEZD Type

Through coolant hole | 3D L/D | Drilling

TEZDF-MS TYPE — Holder





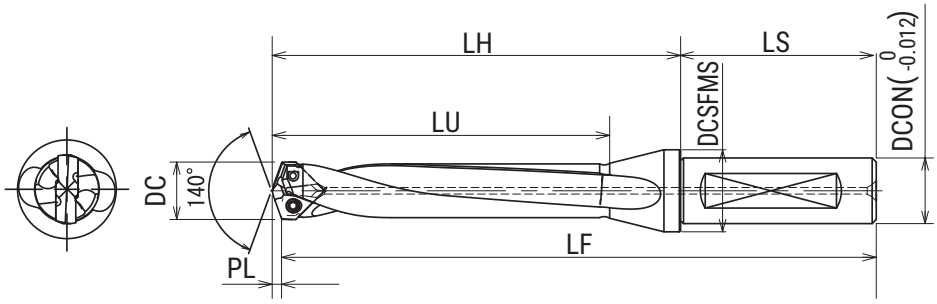
Cat.No.	Stock	DC		Dimensions (mm)							Parts	
		Min.	Max.	LU	LH	LS	LF	PL	DCON	DCSFMS	Screw	Wrench
TEZD1400S16F-MS	●	13.5	14.5	53.5	67.5	48	113	2.3	16	20	DSW-2045H	A-07
TEZD1500S20F-MS	●	14.6	15.5	56.7	71.7	50	119	2.4	20	24.9		
TEZD1600S20F-MS	●	15.6	16.5	60.9	76.9	50	124	2.6	20	24.9	TSW-2556H	A-08
TEZD1700S20F-MS	●	16.6	17.5	64.1	81.1	50	128	2.7	20	24.9		
TEZD1800S20F-MS	●	17.6	18.5	68.3	86.3	50	133	2.9	20	24.9		
TEZD1900S25F-MS	●	18.6	19.5	71.5	90.5	56	143	3.1	25	32	TSW-2567H	A-08
TEZD2000S25F-MS	●	19.6	20.5	75.6	95.6	56	148	3.2	25	32		
TEZD2100S25F-MS	●	20.6	21.5	78.8	99.8	56	152	3.4	25	32		
TEZD2200S25F-MS	●	21.6	22.5	83.0	105.0	56	157	3.5	25	32	DSW-307H	A-10
TEZD2300S25F-MS	●	22.6	23.5	86.2	109.2	56	161	3.7	25	32		
TEZD2400S32F-MS	●	23.6	24.5	90.4	114.4	60	170	3.9	32	41.9		
TEZD2500S32F-MS	●	24.6	25.5	93.5	118.5	60	174	4.0	32	41.9	DSW-309H	A-10
TEZD2600S32F-MS	●	25.6	26.5	97.7	123.7	60	179	4.2	32	41.9		
TEZD2700S32F-MS	●	26.6	27.5	100.9	127.9	60	183	4.4	32	41.9		
TEZD2800S32F-MS	●	27.6	28.5	105.1	133.1	60	188	4.5	32	41.9	TSW-3510H	A-15
TEZD2900S32F-MS	●	28.6	29.5	108.3	137.3	60	192	4.7	32	41.9		
TEZD3000S32F-MS	●	29.6	30.5	112.5	142.5	60	197	4.8	32	41.9		
TEZD3100S32F-MS	●	30.6	31.5	115.7	146.7	60	201	5.0	32	41.9	TSW-3512H	A-15
TEZD3200S32F-MS	●	31.6	32.5	119.8	151.8	60	206	5.2	32	41.9		

Clamp screw	Torque(N·m)
DSW-2045H	0.9
TSW-2556H	1.2
TSW-2567H	1.2
DSW-307H	2.1
DSW-309H	2.1
TSW-3510H	3.0
TSW-3512H	3.0

Through coolant hole | 5D L/D | Drilling

TEZDF-ML TYPE Holder





Cat.No.	Stock	DC		Dimensions (mm)							Parts	
		Min.	Max.	LU	LH	LS	LF	PL	DCON	DCSFMS	Screw	Wrench
TEZD1400S16F-ML	●	13.5	14.5	82.5	99.5	48	145	2.3	16	20	DSW-2045H	A-07
TEZD1500S20F-ML	●	14.6	15.5	87.7	105.7	50	153	2.4	20	24.9		
TEZD1600S20F-ML	●	15.6	16.5	93.9	112.9	50	160	2.6	20	24.9	TSW-2556H	A-08
TEZD1700S20F-ML	●	16.6	17.5	99.1	120.1	50	167	2.7	20	24.9		
TEZD1800S20F-ML	●	17.6	18.5	105.3	126.3	50	173	2.9	20	24.9		
TEZD1900S25F-ML	●	18.6	19.5	110.5	133.5	56	186	3.1	25	32	TSW-2567H	A-08
TEZD2000S25F-ML	●	19.6	20.5	116.6	140.6	56	193	3.2	25	32		
TEZD2100S25F-ML	●	20.6	21.5	121.8	146.8	56	199	3.4	25	32		
TEZD2200S25F-ML	●	21.6	22.5	128.0	154.0	56	206	3.5	25	32	DSW-307H	A-10
TEZD2300S25F-ML	●	22.6	23.5	133.2	161.2	56	213	3.7	25	32		
TEZD2400S32F-ML	●	23.6	24.5	139.4	168.4	60	224	3.9	32	41.9		
TEZD2500S32F-ML	●	24.6	25.5	144.5	174.5	60	230	4.0	32	41.9	DSW-309H	A-10
TEZD2600S32F-ML	●	25.6	26.5	150.7	181.7	60	237	4.2	32	41.9		
TEZD2700S32F-ML	●	26.6	27.5	155.9	188.9	60	244	4.4	32	41.9		
TEZD2800S32F-ML	●	27.6	28.5	162.1	195.1	60	250	4.5	32	41.9	TSW-3510H	A-15
TEZD2900S32F-ML	●	28.6	29.5	167.3	202.3	60	257	4.7	32	41.9		
TEZD3000S32F-ML	●	29.6	30.5	173.5	209.5	60	264	4.8	32	41.9		
TEZD3100S32F-ML	●	30.6	31.5	178.7	215.7	60	270	5.0	32	41.9	TSW-3512H	A-15
TEZD3200S32F-ML	●	31.6	32.5	184.8	222.8	60	277	5.2	32	41.9		

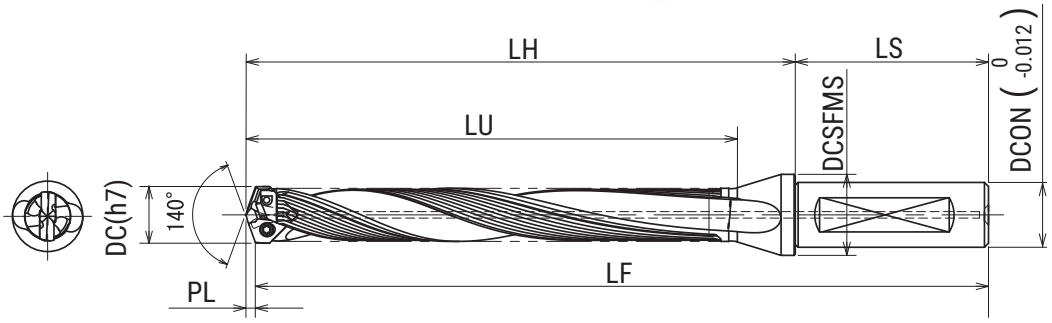
Clamp screw	Torque(N·m)
DSW-2045H	0.9
TSW-2556H	1.2
TSW-2567H	1.2
DSW-307H	2.1
DSW-309H	2.1
TSW-3510H	3.0
TSW-3512H	3.0

INDEXABLE DRILL — TEZD Type

Through coolant hole | 8D L/D | Drilling

TEZDF-XL TYPE Holder





Cat.No.	Stock	DC		Dimensions (mm)							Parts	
		Min.	Max.	LU	LH	LS	LF	PL	DCON	DCSFMS	Screw	Wrench
TEZD1400S16F-XL	●	13.5	14.5	121.5	135.5	48	181	2.3	16	20	DSW-2045H	A-07
TEZD1500S20F-XL	●	14.6	15.5	130.7	145.7	50	193	2.4	20	24.9		
TEZD1600S20F-XL	●	15.6	16.5	138.9	154.9	50	202	2.6	20	24.9	TSW-2556H	A-08
TEZD1700S20F-XL	●	16.6	17.5	148.1	165.1	50	212	2.7	20	24.9		
TEZD1800S20F-XL	●	17.6	18.5	156.3	174.3	50	221	2.9	20	24.9		
TEZD1900S25F-XL	●	18.6	19.5	165.5	184.5	56	237	3.1	25	32	TSW-2567H	A-08
TEZD2000S25F-XL	●	19.6	20.5	173.6	193.6	56	246	3.2	25	32		
TEZD2100S25F-XL	●	20.6	21.5	182.8	203.8	56	256	3.4	25	32		
TEZD2200S25F-XL	●	21.6	22.5	191.0	213.0	56	265	3.5	25	32	DSW-307H	A-10
TEZD2300S25F-XL	●	22.6	23.5	200.2	223.2	56	275	3.7	25	32		
TEZD2400S32F-XL	●	23.6	24.5	208.4	232.4	60	288	3.9	32	41.9		
TEZD2500S32F-XL	●	24.6	25.5	217.5	242.5	60	298	4.0	32	41.9	DSW-309H	A-10
TEZD2600S32F-XL	●	25.6	26.5	225.7	251.7	60	307	4.2	32	41.9		
TEZD2700S32F-XL	●	26.6	27.5	234.9	261.9	60	317	4.4	32	41.9		
TEZD2800S32F-XL	●	27.6	28.5	243.1	271.1	60	326	4.5	32	41.9	TSW-3510H	A-15
TEZD2900S32F-XL	●	28.6	29.5	252.3	281.3	60	336	4.7	32	41.9		
TEZD3000S32F-XL	●	29.6	30.5	260.5	290.5	60	345	4.8	32	41.9		
TEZD3100S32F-XL	●	30.6	31.5	253.7	300.7	60	355	5.0	32	41.9	TSW-3512H	A-15
TEZD3200S32F-XL	●	31.6	32.5	261.8	309.8	60	364	5.2	32	41.9		

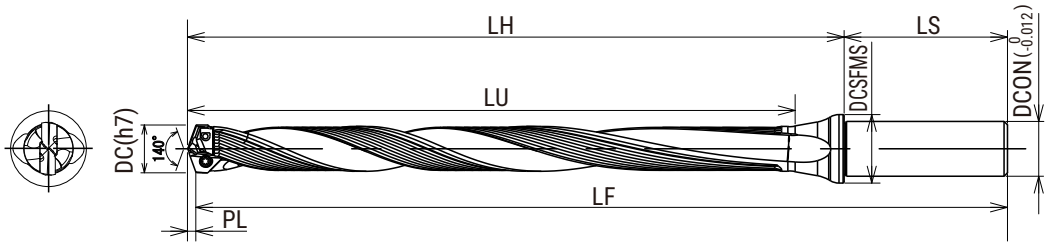
Clamp screw	Torque(N·m)
DSW-2045H	0.9
TSW-2556H	1.2
TSW-2567H	1.2
DSW-307H	2.1
DSW-309H	2.1
TSW-3510H	3.0
TSW-3512H	3.0

INDEXABLE DRILL — TEZD Type

NEW
TEZDF-XXL TYPE — **Holder**

Through coolant hole | 12D L/D | Drilling





Cat.No.	Stock	DC		Dimensions (mm)							Parts	
		Min.	Max.	LU	LH	LS	LF	PL	DCON	DCSFMS	Screw	Wrench
TEZD1400S16F-XXL	●	13.5	14.5	177.5	191.5	48	237	2.3	16	20	DSW-2045H	A-07
TEZD1500S20F-XXL	●	14.6	15.5	190.7	205.7	50	253	2.4	20	24.9		
TEZD1600S20F-XXL	●	15.6	16.5	202.9	218.9	50	266	2.6	20	24.9	TSW-2556H	A-08
TEZD1700S20F-XXL	●	16.6	17.5	216.1	233.1	50	280	2.7	20	24.9		
TEZD1800S20F-XXL	●	17.6	18.5	228.3	246.3	50	293	2.9	20	24.9		
TEZD1900S25F-XXL	●	18.6	19.5	241.5	260.5	56	313	3.1	25	32	TSW-2567H	A-08
TEZD2000S25F-XXL	●	19.6	20.5	253.6	273.6	56	326	3.2	25	32		
TEZD2100S25F-XXL	●	20.6	21.5	266.8	287.8	56	340	3.4	25	32		
TEZD2200S25F-XXL	●	21.6	22.5	279.0	301.0	56	353	3.5	25	32	DSW-307H	A-10

Clamp screw	Torque(N·m)
DSW-2045H	0.9
TSW-2556H	1.2
TSW-2567H	1.2
DSW-307H	2.1

INDEXABLE DRILL — TEZD Type

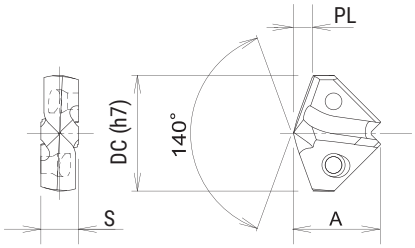
Through coolant hole | DV Coating | Drilling

TEZ TYPE

Insert - Grade JC8050

● Suitable for General Steel





DC	Cat.No.	Stk	A	S	PL	Holder
13.5	TEZ1350	●	11.4	4.5	2.3	TEZD14*
13.6	TEZ1360	●				
13.7	TEZ1370	●				
13.8	TEZ1380	●				
13.9	TEZ1390	●				
14.0	TEZ1400	●				
14.1	TEZ1410	●				
14.2	TEZ1420	●				
14.3	TEZ1430	●				
14.4	TEZ1440	●				
14.5	TEZ1450	●				
14.6	TEZ1460	●	11.5	4.8	2.4	TEZD15*
14.7	TEZ1470	●				
14.8	TEZ1480	●				
14.9	TEZ1490	●				
15.0	TEZ1500	●				
15.1	TEZ1510	●				
15.2	TEZ1520	●				
15.3	TEZ1530	●				
15.4	TEZ1540	●				
15.5	TEZ1550	●				
15.6	TEZ1560	●	12.4	5.0	2.6	TEZD16*
15.7	TEZ1570	●				
15.8	TEZ1580	●				
15.9	TEZ1590	●				
16.0	TEZ1600	●				
16.1	TEZ1610	●				
16.2	TEZ1620	●				
16.3	TEZ1630	●				
16.4	TEZ1640	●				
16.5	TEZ1650	●				
16.6	TEZ1660	●	13.2	5.5	2.7	TEZD17*
16.7	TEZ1670	●				
16.8	TEZ1680	●				
16.9	TEZ1690	●				
17.0	TEZ1700	●				
17.1	TEZ1710	●				
17.2	TEZ1720	●				
17.3	TEZ1730	●				
17.4	TEZ1740	●				
17.5	TEZ1750	●				
17.6	TEZ1760	●	13.5	5.8	2.9	TEZD18*
17.7	TEZ1770	●				
17.8	TEZ1780	●				
17.9	TEZ1790	●				
18.0	TEZ1800	●				
18.1	TEZ1810	●				
18.2	TEZ1820	●				

DC	Cat.No.	Stk	A	S	PL	Holder
18.3	TEZ1830	●	13.5	5.8	2.9	TEZD18*
18.4	TEZ1840	●				
18.5	TEZ1850	●				
18.6	TEZ1860	●	14.2	6.0	3.1	TEZD19*
18.7	TEZ1870	●				
18.8	TEZ1880	●				
18.9	TEZ1890	●				
19.0	TEZ1900	●				
19.1	TEZ1910	●				
19.2	TEZ1920	●				
19.3	TEZ1930	●				
19.4	TEZ1940	●				
19.5	TEZ1950	●				
19.6	TEZ1960	●	15.1	6.5	3.2	TEZD20*
19.7	TEZ1970	●				
19.8	TEZ1980	●				
19.9	TEZ1990	●				
20.0	TEZ2000	●				
20.1	TEZ2010	●				
20.2	TEZ2020	●				
20.3	TEZ2030	●				
20.4	TEZ2040	●				
20.5	TEZ2050	●				
20.6	TEZ2060	●	15.7	6.7	3.4	TEZD21*
20.7	TEZ2070	●				
20.8	TEZ2080	●				
20.9	TEZ2090	●				
21.0	TEZ2100	●				
21.1	TEZ2110	●				
21.2	TEZ2120	●				
21.3	TEZ2130	●				
21.4	TEZ2140	●				
21.5	TEZ2150	●				
21.6	TEZ2160	●	16.6	7.5	3.5	TEZD22*
21.7	TEZ2170	●				
21.8	TEZ2180	●				
21.9	TEZ2190	●				
22.0	TEZ2200	●				
22.1	TEZ2210	●				
22.2	TEZ2220	●				
22.3	TEZ2230	●				
22.4	TEZ2240	●				
22.5	TEZ2250	●				
22.6	TEZ2260	●	17.4	7.5	3.7	TEZD23*
22.7	TEZ2270	●				
22.8	TEZ2280	●				
22.9	TEZ2290	●				
23.0	TEZ2300	●				

INDEXABLE DRILL — TEZD Type

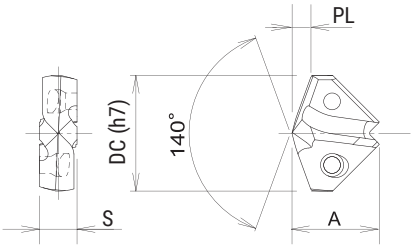
Through coolant hole | DV Coating | Drilling

TEZ TYPE

Insert - Grade JC8050

● Suitable for General Steel





DC	Cat.No.	Stk	A	S	PL	Holder
23.1	TEZ2310	●	17.4	7.5	3.7	TEZD23*
23.2	TEZ2320	●				
23.3	TEZ2330	●				
23.4	TEZ2340	●				
23.5	TEZ2350	●				
23.6	TEZ2360	●	18.2	8.0	3.9	TEZD24*
23.7	TEZ2370	●				
23.8	TEZ2380	●				
23.9	TEZ2390	●				
24.0	TEZ2400	●				
24.1	TEZ2410	●				
24.2	TEZ2420	●				
24.3	TEZ2430	●				
24.4	TEZ2440	●				
24.5	TEZ2450	●				
24.6	TEZ2460	●	19.1	8.0	4.0	TEZD25*
24.7	TEZ2470	●				
24.8	TEZ2480	●				
24.9	TEZ2490	●				
25.0	TEZ2500	●				
25.1	TEZ2510	●				
25.2	TEZ2520	●				
25.3	TEZ2530	●				
25.4	TEZ2540	●				
25.5	TEZ2550	●				
25.6	TEZ2560	●	19.7	8.5	4.2	TEZD26*
25.7	TEZ2570	●				
25.8	TEZ2580	●				
25.9	TEZ2590	●				
26.0	TEZ2600	●				
26.1	TEZ2610	●				
26.2	TEZ2620	●				
26.3	TEZ2630	●				
26.4	TEZ2640	●				
26.5	TEZ2650	●				
26.6	TEZ2660	●	20.4	8.5	4.4	TEZD27*
26.7	TEZ2670	●				
26.8	TEZ2680	●				
26.9	TEZ2690	●				
27.0	TEZ2700	●				
27.1	TEZ2710	●				
27.2	TEZ2720	●				
27.3	TEZ2730	●				
27.4	TEZ2740	●				
27.5	TEZ2750	●				
27.6	TEZ2760	●	21.2	9.0	4.5	TEZD28*
27.7	TEZ2770	●				
27.8	TEZ2780	●				

DC	Cat.No.	Stk	A	S	PL	Holder
27.9	TEZ2790	●	21.2	9.0	4.5	TEZD28*
28.0	TEZ2800	●				
28.1	TEZ2810	●				
28.2	TEZ2820	●				
28.3	TEZ2830	●				
28.4	TEZ2840	●				
28.5	TEZ2850	●				
28.6	TEZ2860	●	22.1	9.0	4.7	TEZD29*
28.7	TEZ2870	●				
28.8	TEZ2880	●				
28.9	TEZ2890	●				
29.0	TEZ2900	●				
29.1	TEZ2910	●				
29.2	TEZ2920	●				
29.3	TEZ2930	●				
29.4	TEZ2940	●				
29.5	TEZ2950	●				
29.6	TEZ2960	●	22.5	9.5	4.8	TEZD30*
29.7	TEZ2970	●				
29.8	TEZ2980	●				
29.9	TEZ2990	●				
30.0	TEZ3000	●				
30.1	TEZ3010	●				
30.2	TEZ3020	●				
30.3	TEZ3030	●				
30.4	TEZ3040	●				
30.5	TEZ3050	●				
30.6	TEZ3060	●	23.4	10	5.0	TEZD31*
30.7	TEZ3070	●				
30.8	TEZ3080	●				
30.9	TEZ3090	●				
31.0	TEZ3100	●				
31.1	TEZ3110	●				
31.2	TEZ3120	●				
31.3	TEZ3130	●				
31.4	TEZ3140	●				
31.5	TEZ3150	●				
31.6	TEZ3160	●	24.3	10	5.2	TEZD32*
31.7	TEZ3170	●				
31.8	TEZ3180	●				
31.9	TEZ3190	●				
32.0	TEZ3200	●				
32.1	TEZ3210	●				
32.2	TEZ3220	●				
32.3	TEZ3230	●				
32.4	TEZ3240	●				
32.5	TEZ3250	●				

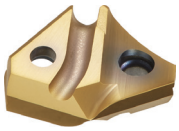
INDEXABLE DRILL — TEZD Type

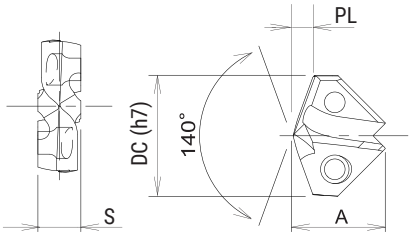
Through coolant hole | JC7500 Coating | Drilling

TEZ-S TYPE

Insert - Grade JC7515

● for Stainless steel, Titanium alloy





DC	Cat.No.	Stk	A	S	PL	Holder
13.5	TEZ1350S	●	11.4	4.5	2.3	TEZD14*
13.6	TEZ1360S	●				
13.7	TEZ1370S	●				
13.8	TEZ1380S	●				
13.9	TEZ1390S	●				
14.0	TEZ1400S	●				
14.1	TEZ1410S	●				
14.2	TEZ1420S	●				
14.3	TEZ1430S	●				
14.4	TEZ1440S	●				
14.5	TEZ1450S	●				
14.6	TEZ1460S	●	11.5	4.8	2.4	TEZD15*
14.7	TEZ1470S	●				
14.8	TEZ1480S	●				
14.9	TEZ1490S	●				
15.0	TEZ1500S	●				
15.1	TEZ1510S	●				
15.2	TEZ1520S	●				
15.3	TEZ1530S	●				
15.4	TEZ1540S	●				
15.5	TEZ1550S	●				
15.6	TEZ1560S	●	12.4	5.0	2.6	TEZD16*
15.7	TEZ1570S	●				
15.8	TEZ1580S	●				
15.9	TEZ1590S	●				
16.0	TEZ1600S	●				
16.1	TEZ1610S	●				
16.2	TEZ1620S	●				
16.3	TEZ1630S	●				
16.4	TEZ1640S	●				
16.5	TEZ1650S	●				
16.6	TEZ1660S	●	13.2	5.5	2.7	TEZD17*
16.7	TEZ1670S	●				
16.8	TEZ1680S	●				
16.9	TEZ1690S	●				
17.0	TEZ1700S	●				
17.1	TEZ1710S	●				
17.2	TEZ1720S	●				
17.3	TEZ1730S	●				
17.4	TEZ1740S	●				
17.5	TEZ1750S	●				
17.6	TEZ1760S	●	13.5	5.8	2.9	TEZD18*
17.7	TEZ1770S	●				
17.8	TEZ1780S	●				
17.9	TEZ1790S	●				
18.0	TEZ1800S	●				
18.1	TEZ1810S	●				

DC	Cat.No.	Stk	A	S	PL	Holder
18.2	TEZ1820S	●	13.5	5.8	2.9	TEZD18*
18.3	TEZ1830S	●				
18.4	TEZ1840S	●				
18.5	TEZ1850S	●				
18.6	TEZ1860S	●	14.2	6.0	3.1	TEZD19*
18.7	TEZ1870S	●				
18.8	TEZ1880S	●				
18.9	TEZ1890S	●				
19.0	TEZ1900S	●				
19.1	TEZ1910S	●				
19.2	TEZ1920S	●				
19.3	TEZ1930S	●				
19.4	TEZ1940S	●				
19.5	TEZ1950S	●				
19.6	TEZ1960S	●	15.1	6.5	3.2	TEZD20*
19.7	TEZ1970S	●				
19.8	TEZ1980S	●				
19.9	TEZ1990S	●				
20.0	TEZ2000S	●				
20.5	TEZ2050S	●				

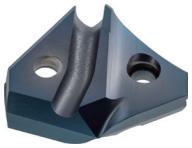
INDEXABLE DRILL — TEZD Type

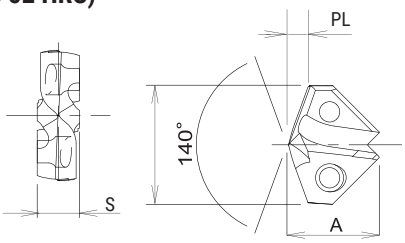
Through coolant hole | DH Coating | Drilling

TEZ-H TYPE

Insert - Grade DH115

● for Mold steel, Hardened steel (up to 52 HRC)





DC	Cat.No.	Stk	A	S	PL	Holder
13.5	TEZ1350H	●	11.4	4.5	2.3	TEZD14*
14.0	TEZ1400H	●				
14.1	TEZ1410H	●				
14.2	TEZ1420H	●				
14.3	TEZ1430H	●				
14.5	TEZ1450H	●				
15.0	TEZ1500H	●	11.5	4.8	2.4	TEZD15*
15.1	TEZ1510H	●				
15.2	TEZ1520H	●				
15.3	TEZ1530H	●				
15.5	TEZ1550H	●				
15.8	TEZ1580H	●	12.4	5.0	2.6	TEZD16*
15.9	TEZ1590H	●				
16.0	TEZ1600H	●				
16.1	TEZ1610H	●				
16.2	TEZ1620H	●				
16.3	TEZ1630H	●				
16.5	TEZ1650H	●				
17.0	TEZ1700H	●	13.2	5.5	2.7	TEZD17*
17.1	TEZ1710H	●				
17.5	TEZ1750H	●				
17.6	TEZ1760H	●	13.5	5.8	2.9	TEZD18*
17.7	TEZ1770H	●				
17.8	TEZ1780H	●				
18.0	TEZ1800H	●				
18.1	TEZ1810H	●				
18.5	TEZ1850H	●				

DC	Cat.No.	Stk	A	S	PL	Holder
19.0	TEZ1900H	●	14.2	6.0	3.1	TEZD19*
19.5	TEZ1950H	●				
19.8	TEZ1980H	●	15.1	6.5	3.2	TEZD20*
20.0	TEZ2000H	●				
20.2	TEZ2020H	●				
20.5	TEZ2050H	●				

INDEXABLE DRILL — TEZD Type

■Recommended Cutting Conditions

●TEZ type JC8050

Material	Structual Steel , Carbon Steel below 280HB	Alloy Steel 280-350HB	Tool Steel below 255HB
Vc (m/min)	75 - 90	70 - 90	70 - 90
f (mm/rev)	0.30 - 0.35	0.22 - 0.25	0.22 - 0.25

Material	Stainless Steel	Grey Cast Iron	Nodular Cast Iron
Vc (m/min)	45	85 - 110	60 - 90
f (mm/rev)	0.25	0.30 - 0.40	0.15 - 0.28

●TEZ-S type JC7515

Material	Titanium Alloy	Stainless Steel
Vc (m/min)	35 - 60	45 - 80
f (mm/rev)	0.15 - 0.20	0.15 - 0.20

●TEZ-H type DH115

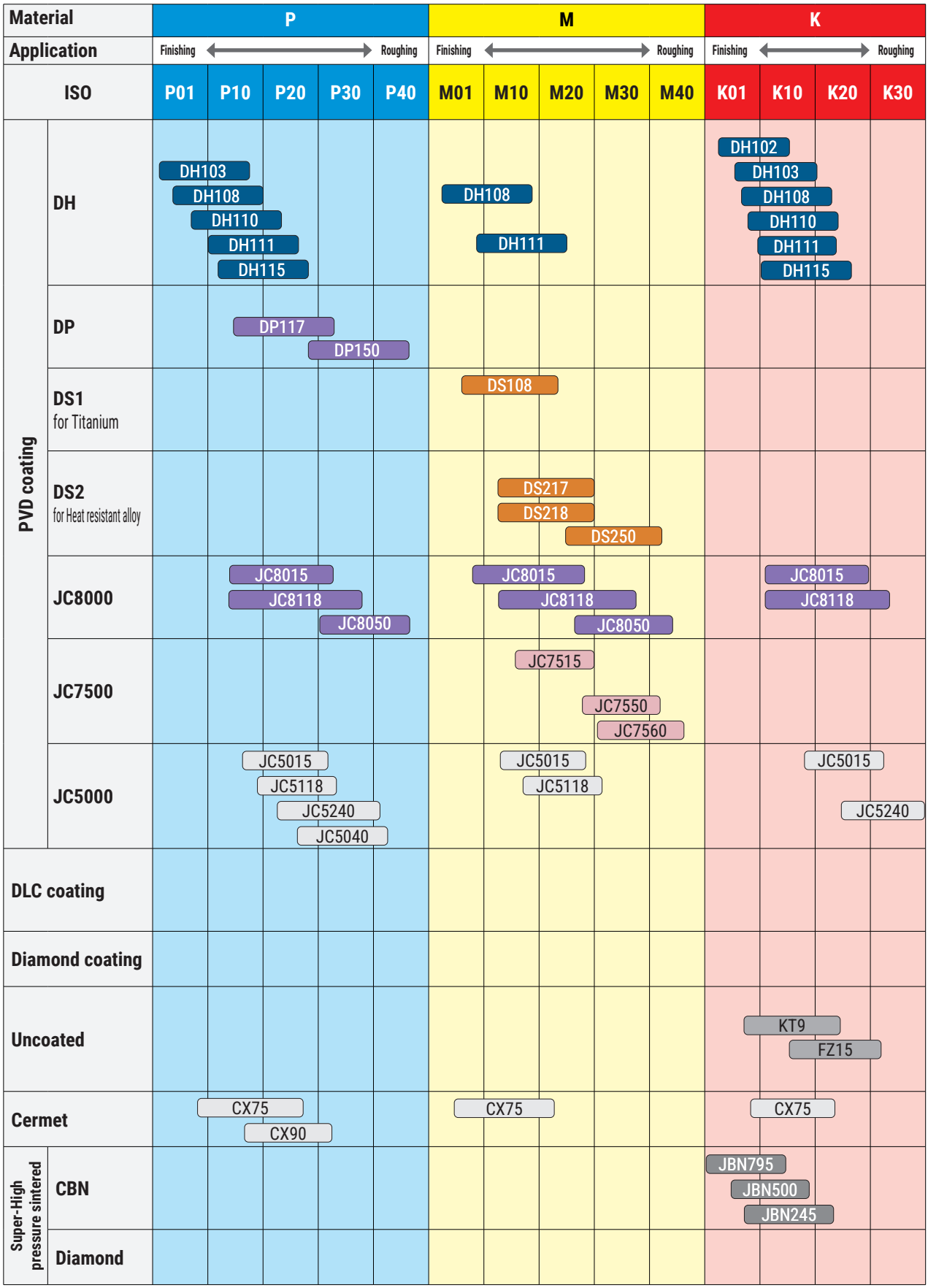
Material	Mold Steel 30 - 36HRC	Mold Steel 38 - 43HRC	Hardened Steel 42 - 52HRC
Vc (m/min)	50 - 70	40 - 60	40 - 60
f (mm/rev)	0.15 - 0.25	0.10 - 0.20	0.10 - 0.15

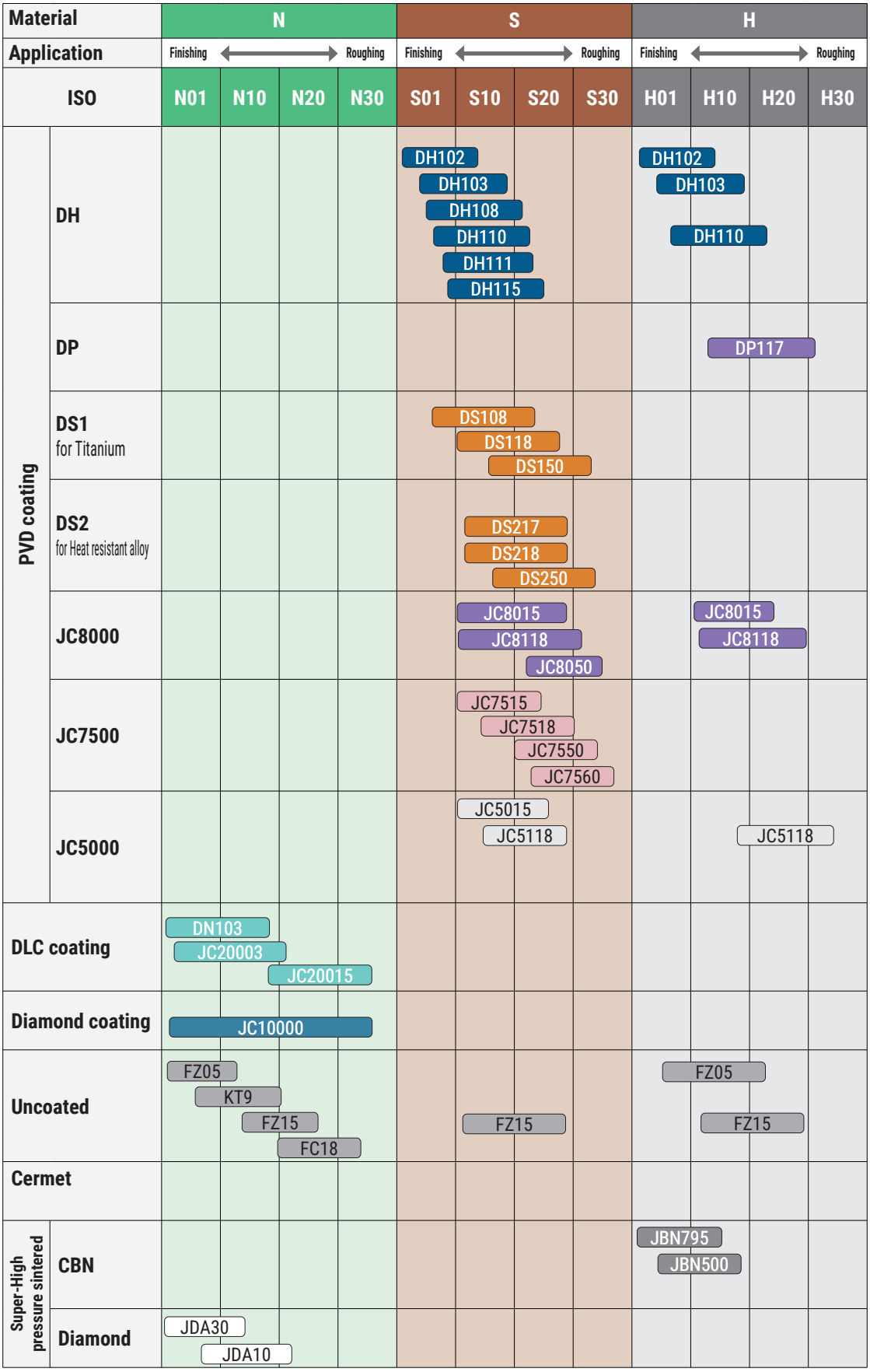
Note)
1. Use water-soluble coolant.
2. Adjust cutting conditions according to machine rigidity or work rigidity.
3. When using -XL (8D) type , reduce rpm & Vf by 20% from standard cutting conditions.
   Pre-drilling of guide-hole (depth : 0.5D) is recommended.

GRADES



DIJET GRADES FOR MILLING TOOLS

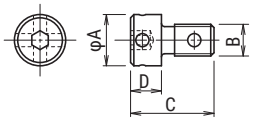


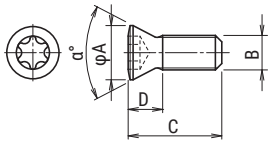
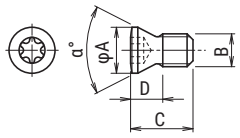
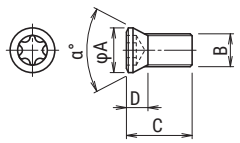
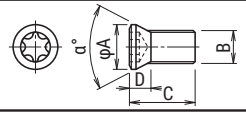
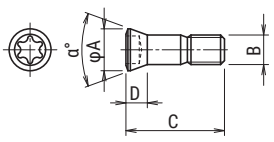
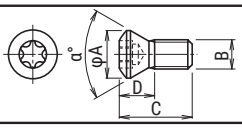

Material
N
S
H
Application
Finishing
Roughing
Finishing
Roughing
Finishing
Roughing
ISO
N01
N10
N20
N30
S01
S10
S20
S30
H01
H10
H20
H30
PVD coating
DH
DH102
DH103
DH108
DH110
DH111
DH115
DH102
DH103
DH110
DP
DP117
DS1
for Titanium
DS108
DS118
DS150
DS2
for Heat resistant alloy
DS217
DS218
DS250
JC8000
JC8015
JC8118
JC8050
JC8015
JC8118
JC7500
JC7515
JC7518
JC7550
JC7560
JC5000
JC5015
JC5118
JC5118
DLC coating
DN103
JC20003
JC20015
Diamond coating
JC10000
Uncoated
FZ05
KT9
FZ15
FC18
FZ15
FZ05
FZ15
Cermet
Super-High pressure sintered
CBN
JBN795
JBN500
Diamond
JDA30
JDA10

SPARE PARTS

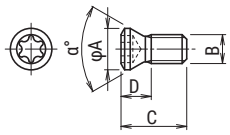


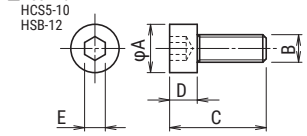
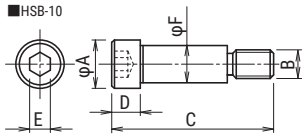
SPARE PARTS

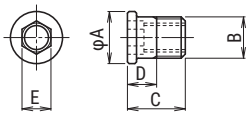
Geometry	Cat.No.	Dimensions						Wrench size
		A	B	C	D	E	α°	
	ADS-513	7.8	M5×0.5	13.0	5.0	–	–	AD-2080
	ADS-514	5.6	M5×0.5	14.5	6.5	–	–	AD-2080

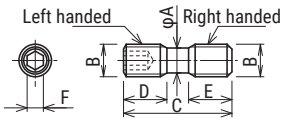
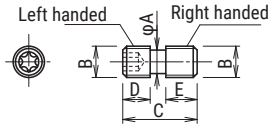
Geometry	Cat.No.	Dimensions						Wrench size	Torque (N•m)
		A	B	C	D	E	α°		
	CSW-206	3.5	M2.5×0.45	5.0	2.4	–	55	T-8	0.9
	CSW-406H	5.0	M4×0.7	6.0	3.6	–	43	T-15	3.6
	CSW-407	5.0	M4×0.7	7.0	3.6	–	43	T-15	3.6
	CSW-408H	5.0	M4×0.7	8.0	3.6	–	43	T-15	3.6
	CSW-513H	7.0	M5×0.8	13.0	4.4	–	63	T-20	5.5
	CSW-510	6.4	M5×0.8	11.0	4.5	–	43	T-20	5.5
	DSW-1840H	2.5	M1.8×0.35	4.0	2.0	–	55	T-6	0.4
	DSW-2045H	3.0	M2×0.4	4.5	2.3	–	60	T-7	0.5
	DSW-2563H	3.45	M2.5×0.45	6.3	2.6	–	55	T-8	1.1
	DSW-306H	4.3	M3×0.5	6.5	3.2	–	55	T-10	1.8
	DSW-307	4.3	M3×0.5	7.5	2.8	–	55	T-10	1.4
	DSW-307H	4.3	M3×0.5	7.6	3.2	–	55	T-10	2.1
	DSW-309H	4.3	M3×0.5	9.0	3.2	–	55	T-10	2.1
	DSW-4075H	5.2	M4×0.7	7.5	3.5	–	55	T-15	3.6
	DSW-408	6.0	M4×0.7	8.5	3.6	–	55	T-15	3.6
	DSW-4085	5.3	M4×0.7	8.5	3.5	–	55	T-15	3.6
	DSW-410H	5.3	M4×0.7	10.0	3.7	–	55	T-15	3.6
	DSW-4510H	6.8	M4.5×0.75	10.0	4.7	–	55	T-20	6.0
	DSW-4512H	6.8	M4.5×0.75	12.5	5.2	–	55	T-20	6.0
	DSW-509	7.0	M5×0.8	9.5	4.9	–	55	T-20	6.1
	DSW-511H	7.0	M5×0.8	11.5	4.9	–	55	T-20	6.1
	ESW-206	3.6	M2.5×0.45	6.0	2.0	–	60	T-8	0.9
	ESW-304	4.0	M3×0.5	4.5	2.0	–	55	T-8	1.4
	ESW-306	4.0	M3×0.5	6.0	2.0	–	55	T-8	1.4
	ESW-307	4.0	M3×0.5	7.5	2.0	–	55	T-8	1.4
	ESW-405	5.3	M4×0.7	5.9	2.7	–	55	T-15	3.1
	ESW-406	5.3	M4×0.7	6.6	2.7	–	55	T-15	3.1
	ESW-408	5.3	M4×0.7	8.0	2.7	–	55	T-15	3.1
	ESW-410	5.3	M4×0.7	10.0	2.7	–	55	T-15	3.1
	ESW-507	6.8	M5×0.8	7.5	3.4	–	55	T-25	5.5
	ESW-508	6.8	M5×0.8	8.2	3.4	–	55	T-25	5.5
	ESW-510	6.8	M5×0.8	10.0	3.4	–	55	T-25	5.5
	FSW-2005H	2.5	M2×0.25	5.0	1.3	–	40	T-6	0.5
	FSW-2506H	3.0	M2.5×0.35	6.6	1.5	–	40	T-7	0.9
	FSW-3007H	3.8	M3×0.35	8.1	2.0	–	40	T-8	1.2
	FSW-3509H	4.7	M3.5×0.6	9.6	2.3	–	40	T-10	2.0
	FSW-4013H	5.8	M4×0.7	13.5	3.3	–	40	T-15	3.0
	FSW-5016H	6.8	M5×0.8	16.4	3.2	–	40	T-20	4.0
	FSW-6020	8.5	M6×1.0	20.0	4.3	–	40	T-30	6.0
	FSW-8025	11.0	M8×1.25	25.0	5.5	–	40	T-40	6.0
	FSW-8025S/KSW-8025	11.0	M8×1.25	25.0	5.5	–	40	T-30	6.0
	HSW-614H	10.0	M6×1.0	15.0	7.3	–	60	T-30	7.5

SPARE PARTS

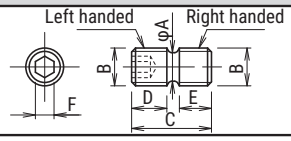
Geometry	Cat.No.	Dimensions						Wrench size	Torque (N•m)
		A	B	C	D	E	α°		
	TSW-2250	3.1	M2.2×0.45	5.0	2.3	–	60	T-7	0.6
	TSW-2556H	3.6	M2.5×0.45	5.6	2.7	–	60	T-8	1.1
	TSW-2567H	3.6	M2.5×0.45	6.7	2.7	–	60	T-8	1.1
	TSW-307H	4.3	M3×0.5	7.6	3.1	–	60	T-10	2.1
	TSW-3509H	5.3	M3.5×0.6	9.0	4.5	–	60	T-15	3.0
	TSW-3510H	5.3	M3.5×0.6	10.0	4.5	–	60	T-15	3.0
	TSW-3512H	5.3	M3.5×0.6	11.5	4.5	–	60	T-15	3.0
	TSW-408	5.5	M4×0.7	8.0	3.3	–	60	T-15	3.1
	TSW-410H	5.3	M4×0.7	10.0	3.6	–	60	T-15	3.5
	TSW-511	7.0	M5×0.8	11.0	5.0	–	60	T-20	5.5
	TSW-612	8.5	M6×1.0	12.0	4.8	–	60	T-25	7.5
	TSW-614H	8.5	M6×1.0	14.0	6.2	–	60	T-25	7.5

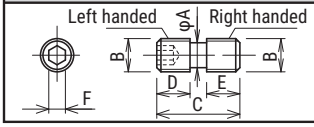
Geometry	Cat.No.	Dimensions						Wrench size	Torque (N•m)
		A	B	C	D	E	F		
■HCS4-10 HCS5-10 HSB-12 	HCS4-10	7.0	M4×0.7	14.0	4.0	3.0	–	–	–
	HCS5-10	8.5	M5×0.8	15.0	5.0	4.0	–	–	–
■HSB-10 	HSB-10	17.0	M10×1.5	56.0	10.0	8.0	13	–	–
	HSB-12	18.0	M12×1.75	62.0	12.0	10.0	–	–	–

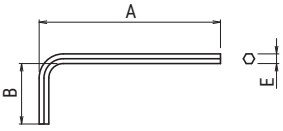
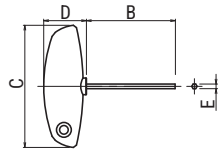
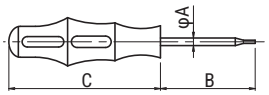
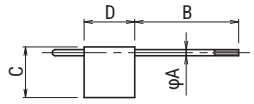
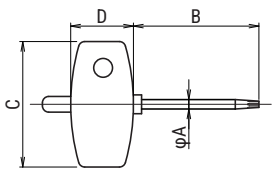
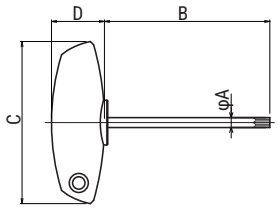
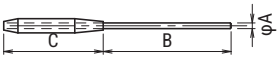
Geometry	Cat.No.	Dimensions						Wrench size	Torque (N•m)
		A	B	C	D	E	F		
	SSW-535	6.3	M5×0.5	7.0	3.1	3.5	–	–	6.5

Geometry	Cat.No.	Dimensions						Wrench size	Torque (N•m)
		A	B	C	D	E	F		
	LS-101	4.6	M6×1.0	16.0	6.5	6.5	3.0	–	6.0
	LS-106	4.6	M6×1.0	14.5	6.5	5.0	3.0	–	6.0
	LS-107	4.6	M6×1.0	13.0	5.0	5.0	3.0	–	6.0
	LS-109	5.5	M7×0.75	19.0	7.5	8.0	–	T-25	7.0
	LS-110	4.8	M6×0.75	22.0	8.0	8.0	–	T-15	6.0

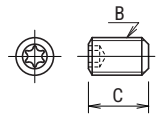
SPARE PARTS

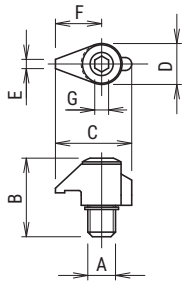
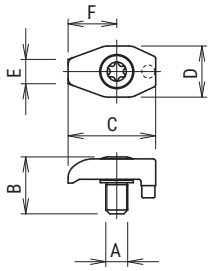
Geometry	Cat. No	Dimensions						Wrench size	Torque (N•m)
		A	B	C	D	E	F		
	LS-113	3.7	No.10-32UNF	10.2	4.5	4.1	2.4	–	–

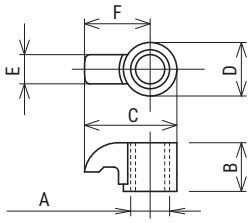
Geometry	Cat. No	Dimensions						Wrench size	Torque (N•m)
		A	B	C	D	E	F		
	SLS-3	6.0	M8×1.0	20.0	8.0	8.0	4.0	–	8.0

Geometry	Cat. No	Dimensions					Wrench size
		A	B	C	D	E	
	LW-020	52.0	15.0	–	–	2.0	–
	LW-025	59.5	18.0	–	–	2.5	–
	LW-030	67.0	20.0	–	–	3.0	–
	LW-035	71.5	22.5	–	–	3.5	–
	LW-040	75.0	25.0	–	–	4.0	–
	LW-050	80.0	28.0	–	–	5.0	–
	A-030	–	60.0	80.0	28.0	3.0	–
	A-07SD	4.0	60.0	80.0	–	–	T-7
	A-08SD	4.0	70.0	80.0	–	–	T-8
	A-10SD	4.0	70.0	95.0	–	–	T-10
	A-20SD	5.0	90.0	105.0	–	–	T-20
	A-25SD	5.0	100.0	105.0	–	–	T-25
	A-06	1.7	34.5	15.0	15.0	–	T-6
	A-07	2.0	34.5	15.0	15.9	–	T-7
	A-08	2.3	39.0	19.0	19.0	–	T-8
	A-10	3.0	40.0	40.0	20.0	–	T-10
	A-15	3.5	45.0	40.0	20.0	–	T-15
	A-20W	4.0	45.0	40.0	20.0	–	T-20
	A-15T	4.0	100.0	80.0	26.0	–	T-15
	A-20	4.0	100.0	100.0	32.0	–	T-20
	A-20L	5.5	200.0	100.0	32.0	–	T-20
	A-25	4.5	100.0	100.0	32.0	–	T-25
	A-27	5.5	100.0	100.0	32.0	–	T-27
	A-30	6.0	100.0	100.0	32.0	–	T-30
	AD-2080	2.0	45.0	35.0	–	–	–

SPARE PARTS

Geometry	Cat. No	Dimensions						Wrench size	Torque (N•m)
		A	B	C	D	E	F		
	RSW-05008	–	M5×0.8	8.0	–	–	–	T-10	–

Geometry	Cat. No	Dimensions							Wrench size
		A	B	C	D	E	F	G	
	DCM-1	M5×0.8	13.8	13.8	6.8	2.0	8.5	2.5	–
	DCM-5	M6×1.0	17.0	16.5	8.9	2.0	10.0	3.0	–
	DCM-17	M4.5×0.75	11.7	18.0	10.5	5.0	10.0	–	T-20
	DCM-18	M3.5×0.6	10.0	13.0	7.6	3.0	7.2	–	T-15

Geometry	Cat. No	Dimensions					
		A	B	C	D	E	F
	DCM-2	M8×1.0	10.0	19.0	11.0	6.0	13.5

Shape	Cat. No
	MOLY

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