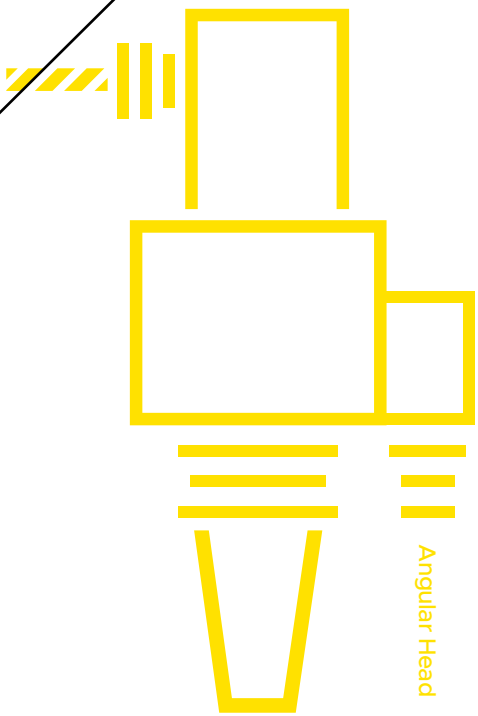
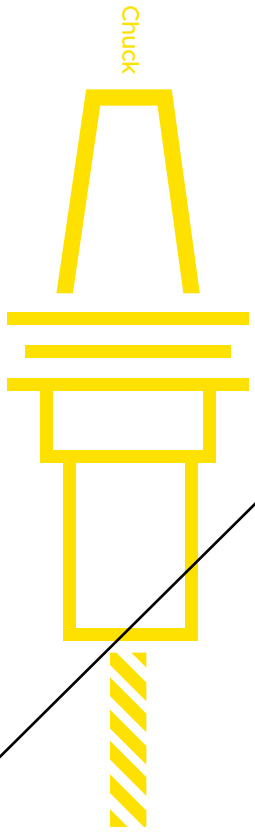
ENGLISH

2022 DINOX FOCUS





DINE
DINE GROUP

We will be the leading global company with the **best technical skills**

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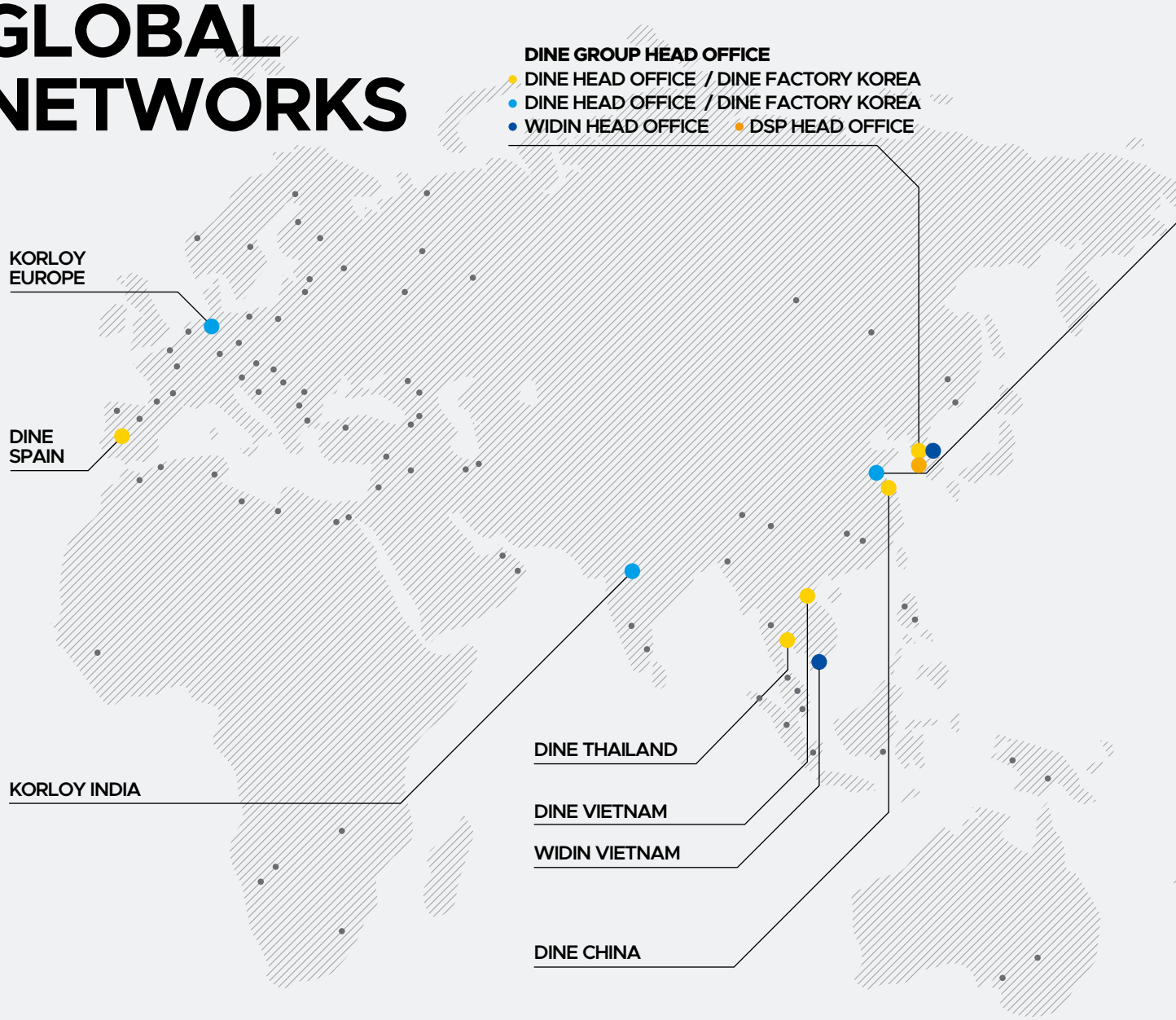
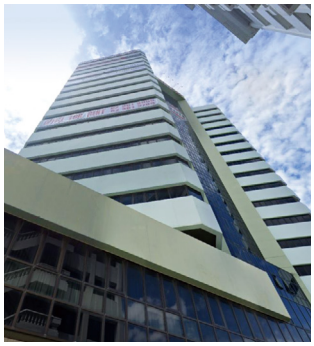
GLOBAL NETWORKS



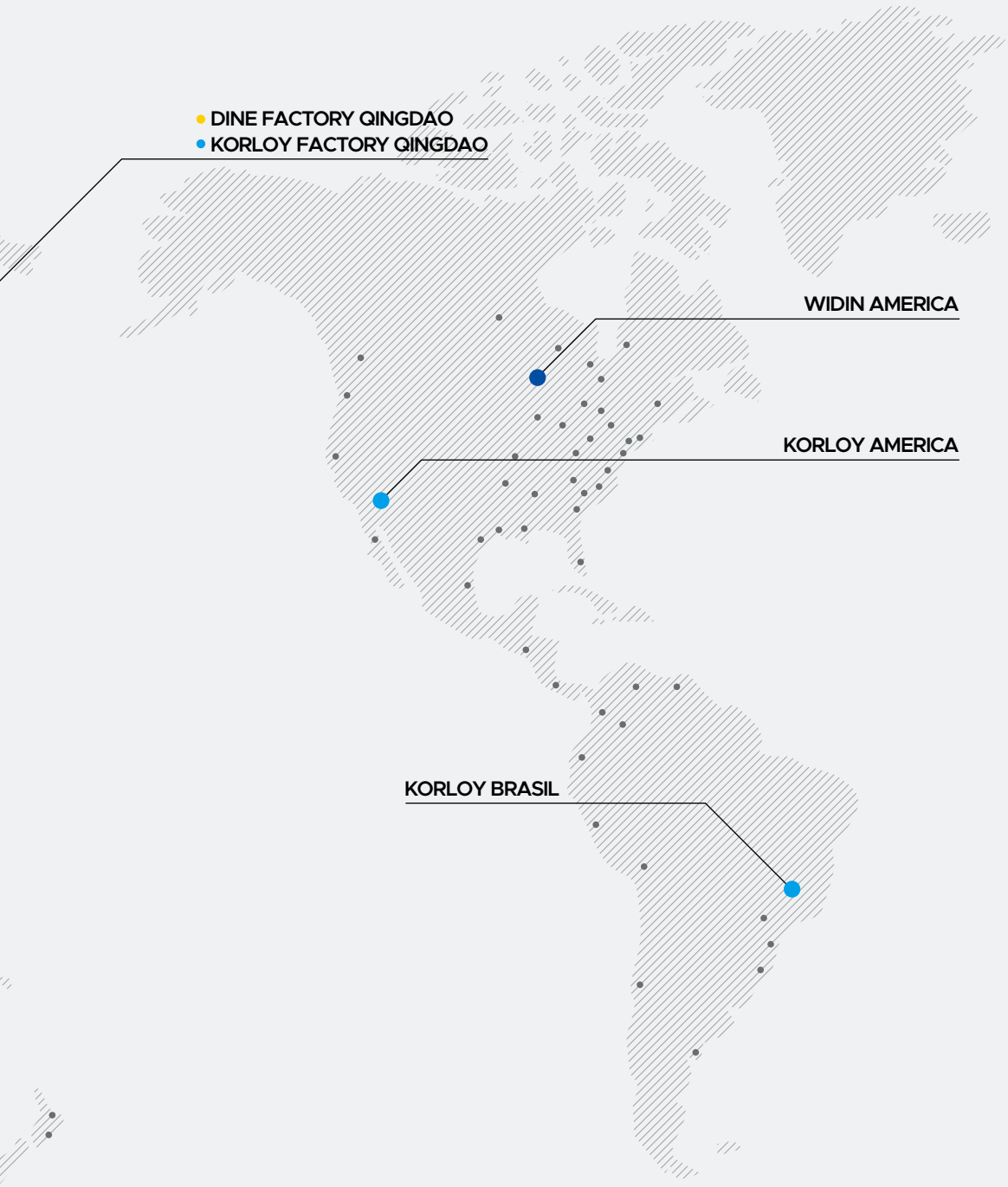


DINE(DTC) Thailand since 2019

DINE(DCI) China since 2006

DINE(DVC) Vietnam since 2017

DINE(DMS) Spain since 2022




DINE(Head office) Korea since 1975

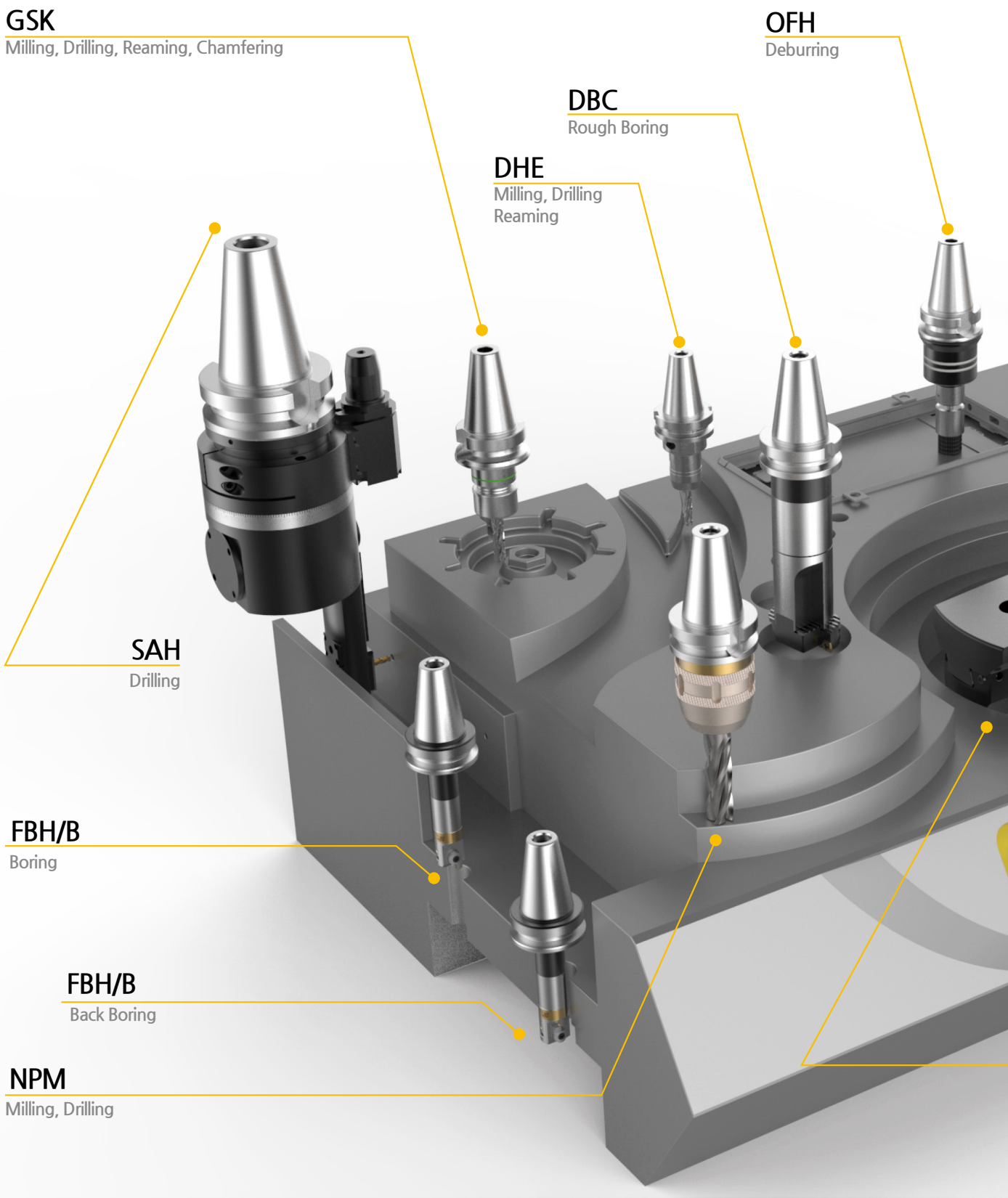

KORLOY Korea since 1966

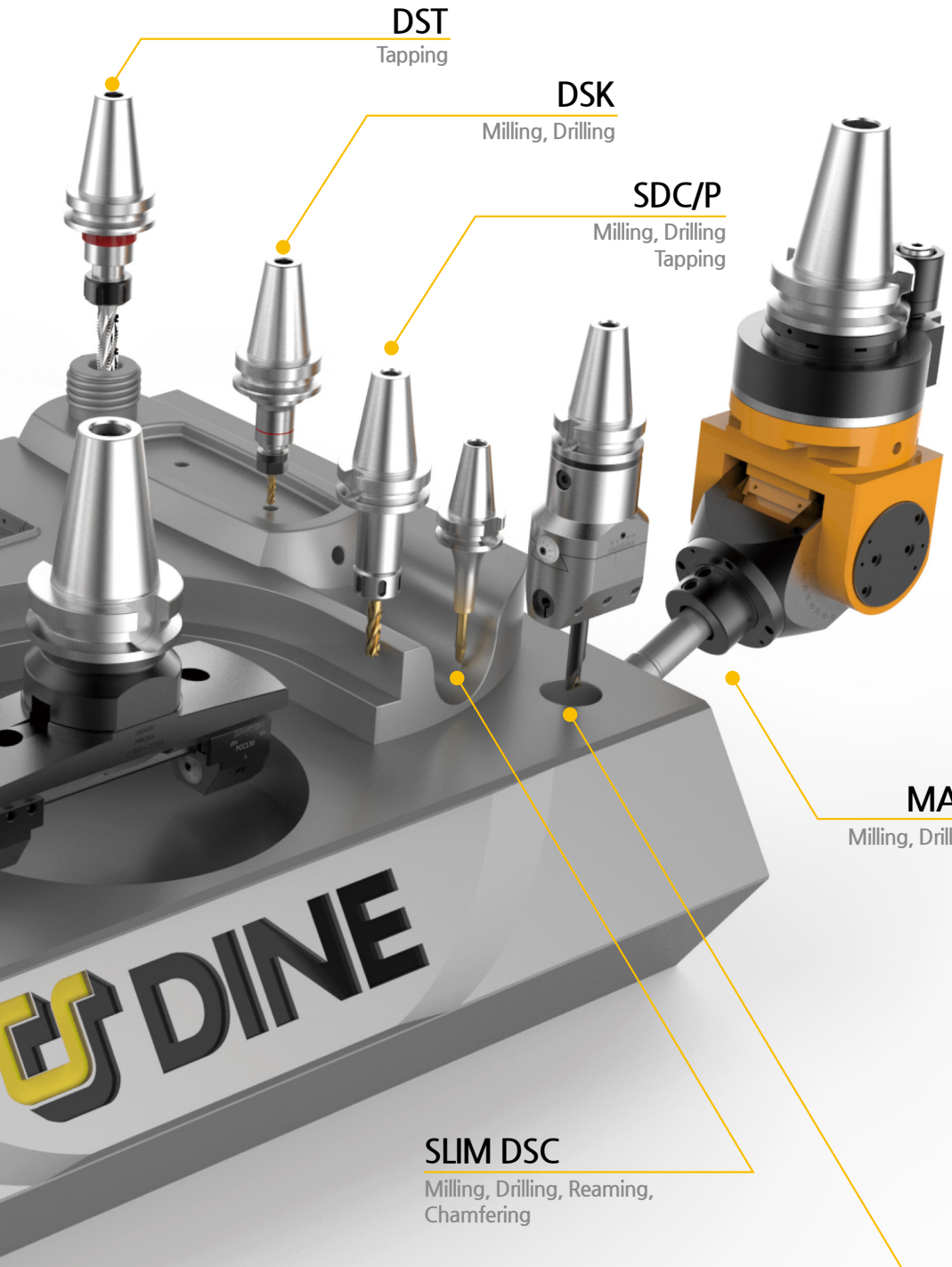

WIDIN Korea since 1988


DSP Tooling inc. Korea since 2000

TOOL APPLICATION

NC TOTAL TOOLING SYSTEM





DST
Tapping

DSK
Milling, Drilling

SDC/P
Milling, Drilling
Tapping

MAH
Milling, Drilling

SLIM DSC
Milling, Drilling, Reaming,
Chamfering

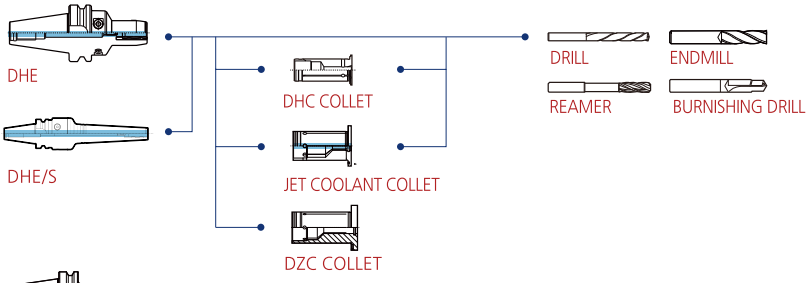
TBC • FBC
Large boring

KMB
Micro boring

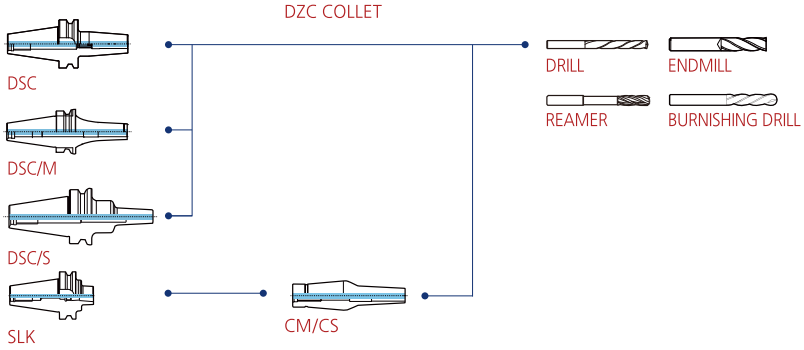
DINOX MAP

NC TOTAL TOOLING SYSTEM

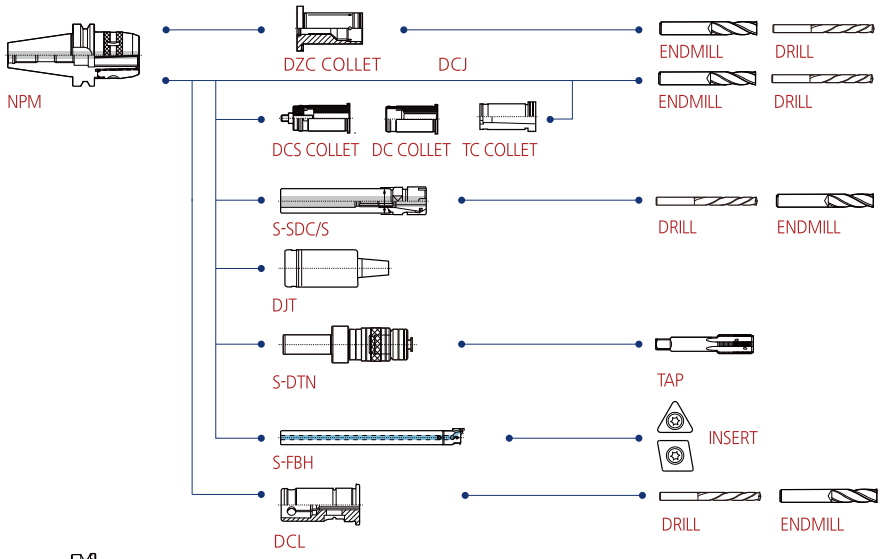
1. Hydraulic expansion chuck



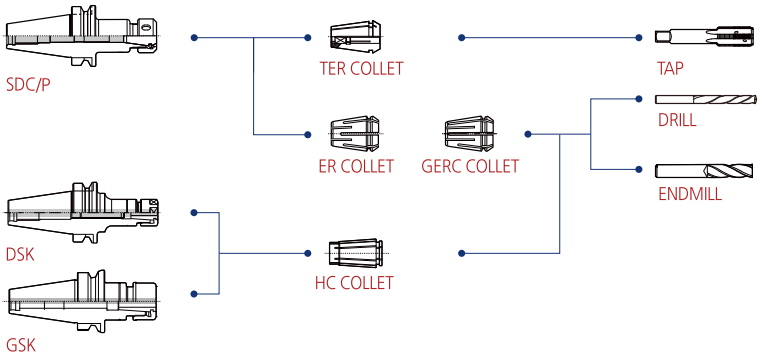
2. Shrinking chuck



3. Milling chuck

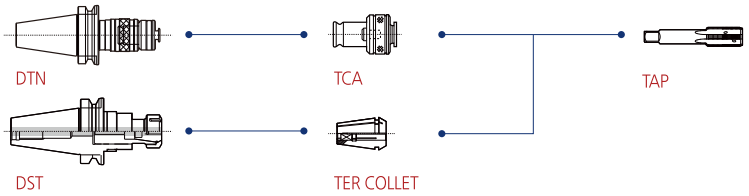


4. Collet chuck



5. Drill chuck

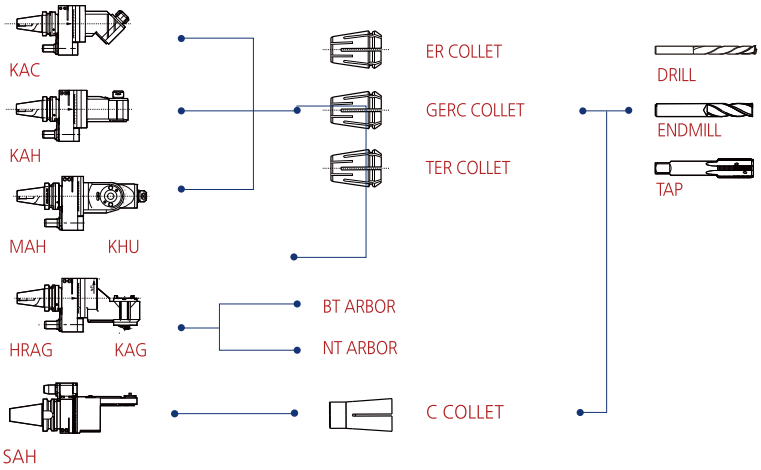
6. Tapping holder



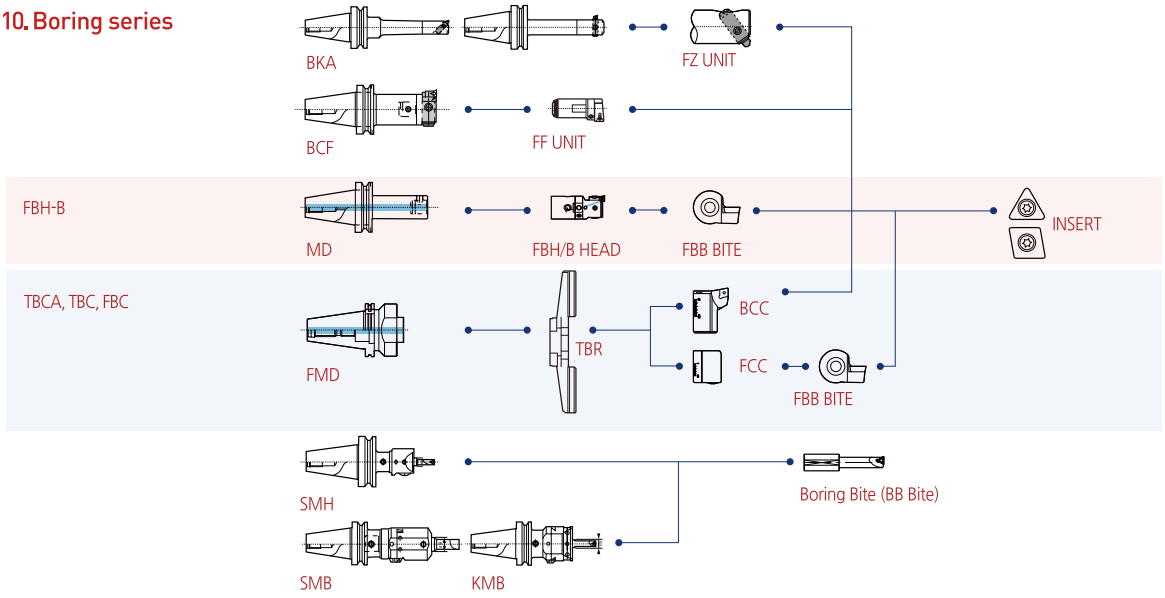
7. Side lock arbor

8. Face mill arbor

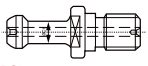
9. Angular head



10. Boring series



11. Pull stud bolt



DHE/S

Slim hydraulic expansion chuck

G6.3	25,000	5㎛	C			
G value	Max RPM	Run-out	Coolant System	Milling	Drilling	Reaming

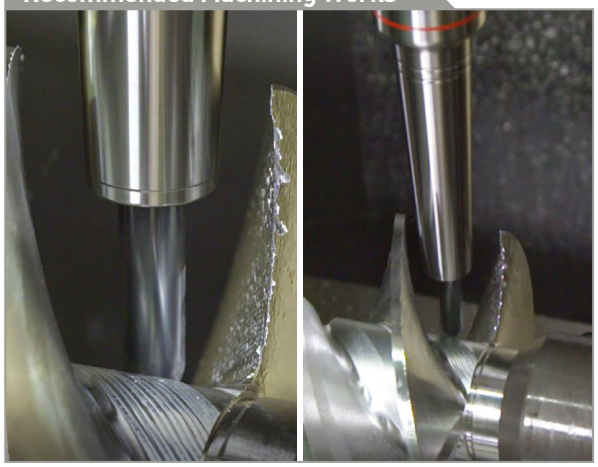
Features

- Optimized chuck for machining that requires high-quality surface roughness and accuracy
- Suitable for challenging mold and automotive parts machining that involves complicated shapes and a lot of interferences
- Ideal for metal impeller machining, which requires deep penetration
- Enables easy tool connection without any additional connecting device
- Easy to perform fine boring operations (0.02-0.2mm)
- Application scope: milling, drilling, reaming

NAMING

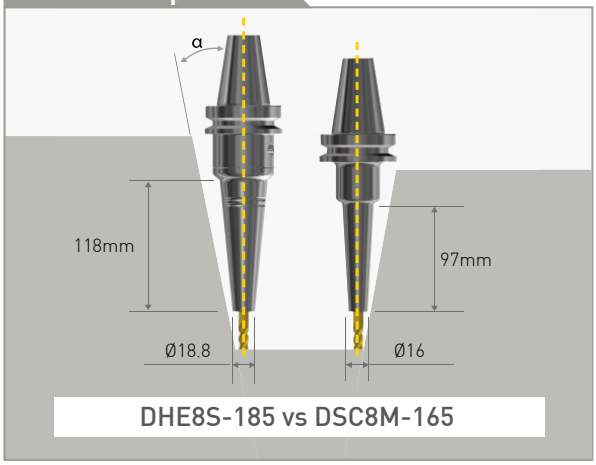
BT30	DHE	8	S	–	115
Spindle	Hydraulic Expansion Chuck	Tool Dia.	Slim		Length

Recommended Machining Works



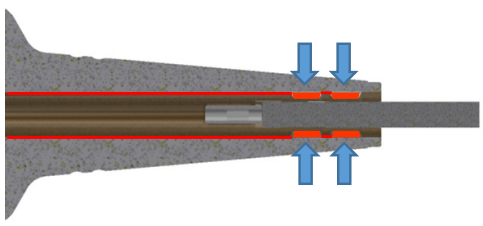
- Optimized for machining that requires high precision
- Enables challenging narrow and deep machining
- Products that require fine boring operations

Product Comparison



- Length and thickness are the same as those of DSC/M TYPE (if the tool projection length is 40mm, difference of α = around 2°)
- Longer gauge line and higher rigidity (versus the DSC/M TYPE)
- Ideal for mold machining due to its 3-degree taper shape

Stable Clamping force



- Maintains high clamping force and good accuracy by holding the tool at two points

High-precision

- RUN OUT : below 5㎛(Long type 8㎛)
- L = 3 x ØD

DHE

Hydraulic expansion chuck

G6.3	15,000	5㎛	C	Milling	Drilling	Reaming
G value	Max RPM	Run-out	Coolant System			

Features

- Ideal for machining on molds, automotive parts, and precision parts due to its high precision machining operations
- Improves machining surface roughness due to the effective vibration resistance of its hydraulic seal
- Reduces replacement time and operator fatigue because the tool is removable using a T-wrench
- Tool clamping range: Ø6~Ø32

NAMING

BT40	–	DHE	20	–	140
Spindle		Hydraulic Expansion Chuck	Tool Dia.		Length

Product Features

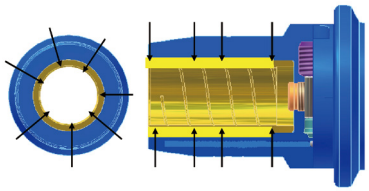
Its high precision not only increases the tool life of a cutting tool by reducing the wear of the tool but also improves machining surface roughness with the effect of vibration reduction by its hydraulic seal.

High precision

- RUN OUT : below 5㎛
- L = 3 x ØD
- Shank : tolerance of ØD: h6

Completely closed inside construction (durability)

- The completely closed system of its inner diameter prevents dust, cutting oil, lubricant, and chips, etc. from penetrating it.
- Maintains clamping force and precision for a long time



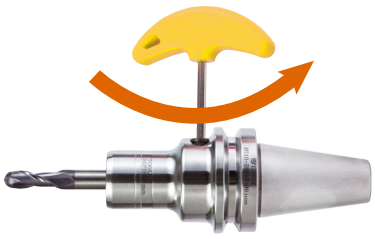
SHANK	Grade	Max.RPM
BT50, SK50,HSK100A	G6.3	8,000
BT40, SK40, HSK63A	G6.3	10,000
BT30, SK30, HSK50A	G6.3	15,000

C Internal coolant system installed by default.

C Internal coolant system is optional. (HSK Shank)

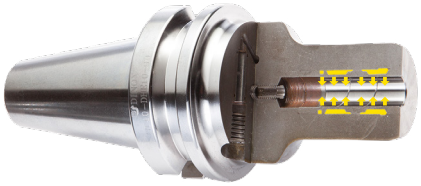
Removal availability by using T-wrench tool

- Clamping / unclamping structure that only requires simple operation (convenience)
  : Reduces operator fatigue
  : Enhances the operation rate of equipment



Stable clamping force

Provides clamping force by fixing the space of the holder and tool with hydraulic pressure



1:1 Chat

DSC
Shrinking Chuck

G2.5	25,000	3㎛	C	Milling	Drilling	Reaming	Chamfering
G value	Max RPM	Run-out	Coolant System				

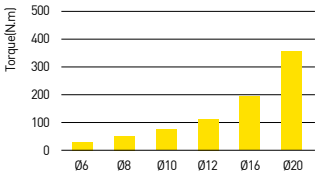
Features

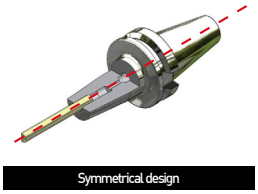
- Uses special steel specially heat-treated
- Enables anyone to perform high-precision tightening and machining
- Ensure a long tool life and enhanced machining accuracy by minimizing interference and tool protrusion length for deep groove machining
- Boring range : Ø3~Ø20

NAMING

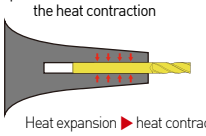
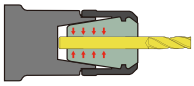
BT50	–	DSC	6	–	S	–	165	–	S
Shank Shape BT HSK SK ST CS CM		Holder type DSC : Shrinking chuck SLK : 2piece holder	Tool Dia.		Type S : Silm M : Middle NON : General		Length		Special S : Curve type NON : General

High clamping force





· Increase of 30% clamping force versus hydraulic expansion chuck
· Definite power transmission · Runout (≤ 0.003mm)

Shrinking Chuck	Collet Chuck
Fix the space between the holder and tool as the heat contraction	Fix the tool using elasticity of the collet
	
Heat expansion ▶ heat contraction	Elastic strain
Very high clamping force	High clamping force

Slim type series

Straight type

Used by combining with various holders such as hydraulic expansion chuck, milling chuck, and collet chuck.

Mono type

Used with high precision as integral types

2piece type

Holder+ collet connection shape
Connecting the holder and collet by the bolt tightening method

DSC
Shrinking Chuck

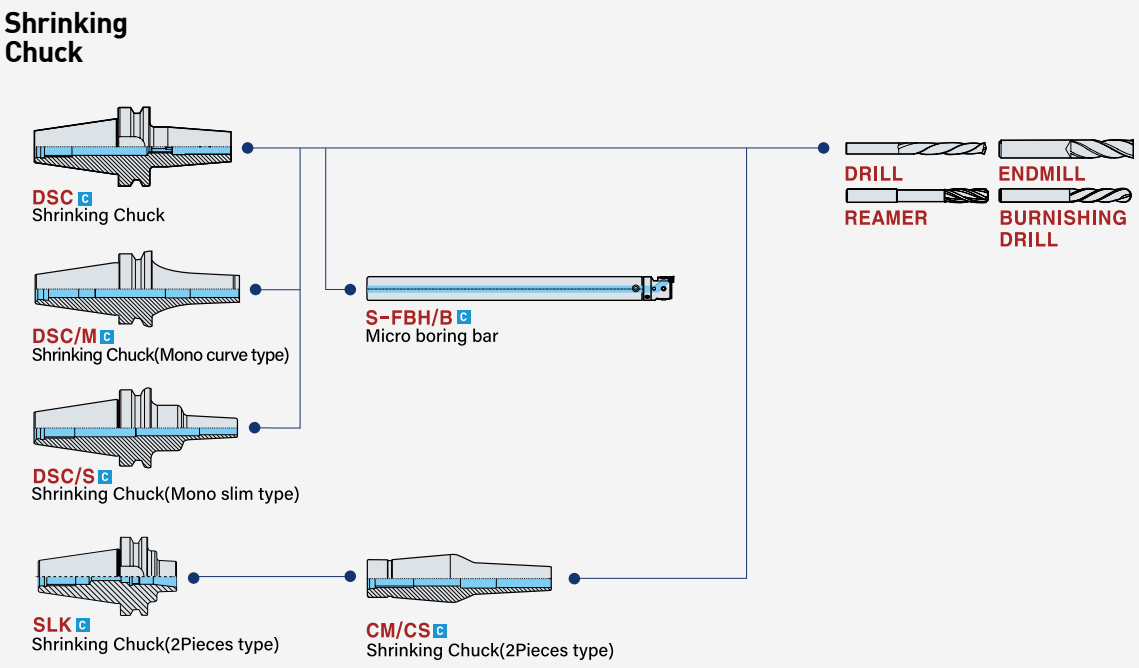
Tool tightening tolerance

Tool Shank	Tool Shank Tolerance[h6]	Tool Shank	Tool Shank Tolerance[h6]	Tool Shank	Tool Shank Tolerance[h6]	Tool Shank	Tool Shank Tolerance[h6]
Ø3	0~-0.008	Ø6	0~-0.008	Ø12	0~-0.011	Ø25	0~-0.013
Ø4	0~-0.009	Ø8	0~-0.009	Ø16	0~-0.011	Ø32	0~-0.016
Ø5	0~-0.011	Ø10	0~-0.011	Ø20	0~-0.013		

Min. tool insertion depth

Inner diameter(Ø)	Type	Ø6	Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
Min. tool insertion depth	Slim	18	24	30	30	-	-	-	-
	Medium	18	24	30	30	32	40	-	-
	General	26	26	32	37	37	40	42	52

DSC MAP



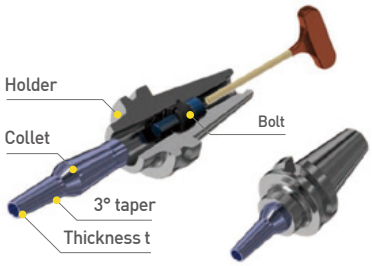
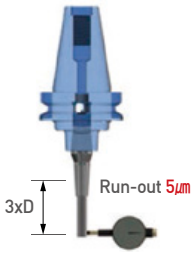
DSC
Shrinking Chuck

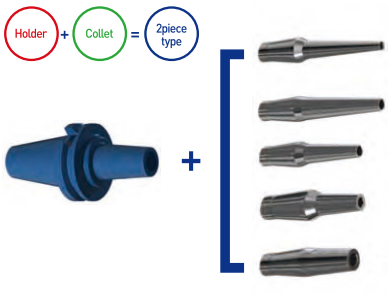
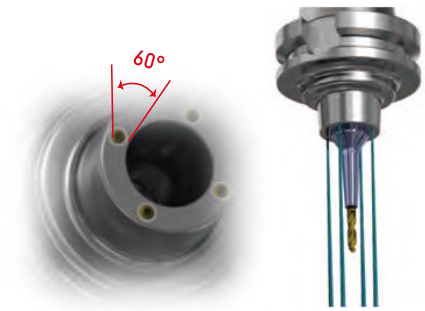
MONO CURVE TYPE

- Integral DSC of outstanding accuracy and rigidity balance characteristics
- Long but rigid holder design

2PIECE TYPE

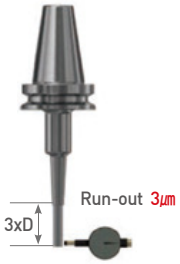
2Piece types enable various machining operations by collet replacement and provide convenience in tool management and use based on easy and fast assembly using tightening bolts.

Shape	Accuracy	TYPE
		 Slim type / Medium type
		Holder+collet connection shape Connecting the holder and collet by the bolt tightening method

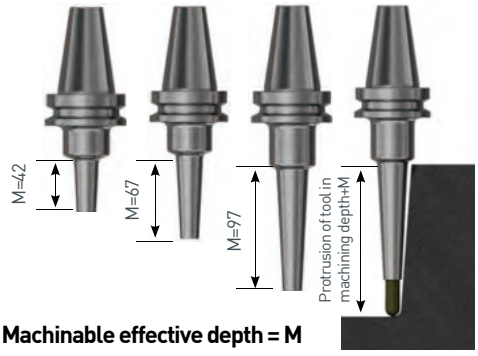
Various collet shapes - 28 in total	Coolant system
	
Tool management and purchase expenses are reduced by changing and using only collet in one body	Coolant type 60-degree angle adjustable

DSC
Shrinking Chuck

MONO TYPE

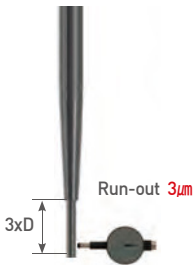
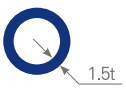
Shape	Accuracy	TYPE	
		 Slim type	 Medium type

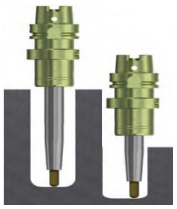
※ Ensures good rigidity by using special steel instead of general steel and maintains high precision due to its excellent thermal resistance even when it is used more than 5,000 times.
※ Enables stable cutting and good surface roughness due to its high rigidity
※ Provides a long tool life due to its high precision



Machinable effective depth = M

STRAIGHT TYPE

Shape	Accuracy	TYPE	
 Collet chuck / Hydraulic expansion chuck / Milling chuck		 Slim type	 Medium type
		Used by combining with various holders such as hydraulic expansion chuck, milling chuck, and collet chuck, etc.	

Examples	
	
Ø6~Ø12 tools can be tightened Various lengths and shank sizes	Lengths can be adjusted and used according to machining situations

※ Straight types used by combining with various holders such as hydraulic expansion chuck and collet chuck, etc. maintain high precision and help enable various machining operations at an affordable price.
※ There are 20 types of shanks that can be used according to work situations

1:1 Chat

NPM

New power milling chuck

15㎛ Run-out | C Coolant System | Milling | Drilling

Features

- Strong clamping force more than 500kgf*m (based on NPM42)
- Uses its DUST BLOCK function to prevent outside foreign substance completely
- Enables jet coolant operation
- Implements high precision within 15㎛ in the case of L/D=3
- Boring range : Ø20~Ø42

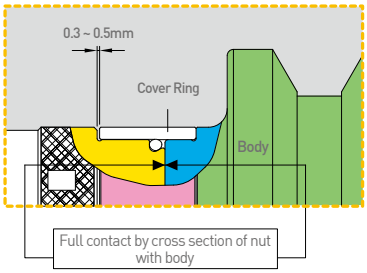
NAMING

BT40	–	NPM	32	–	110
Spindle		New Power Milling Chuck	Tool Dia.		Length

Strong clamping force

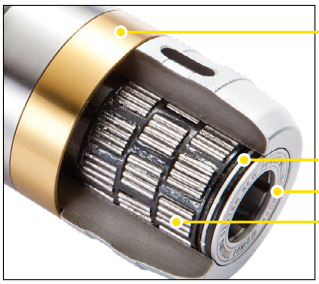
NPM20 : Min. 130kgf·m
NPM25 : Min. 265kgf·m
NPM32 : Min. 350kgf·m
NPM42 : Min. 500kgf·m
NPM32(Short type) : Min. 230kgf·m

Durability enhanced by preventing foreign objects to be mixed (Dust Block) PAT.

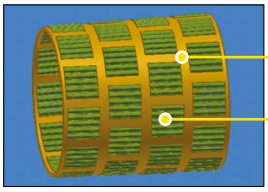


STOP RING applied to the front part
- Preventing mixing of SHIM RING and O-Ring

NPM Structural Features



Needle Roller Bearing 〈NPM20〉



- Special steel bearing used to prevent damage
- Strong tightening due to load dispersion in the process of chucking

Enables stable machining from rough to medium boring

Ensures excellent vibration absorption and enhanced cutting power when cutting due to perfect cross-sectional adhesion and strong clamping force

Enables stable operation from rough to medium machining

Radial cutting depth (Rd)=1.0mm

Radial cutting depth (Rd)=2.5mm

Radial cutting depth (Rd)=3.5mm

Radial cutting depth (Rd)=5.0mm

Radial cutting depth (Rd)=8.0mm

NPM

New power milling chuck

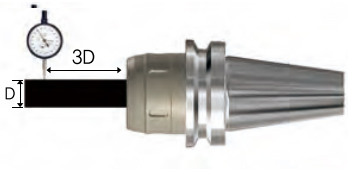
Type

- **BT Type** : BT30, BT40, BT50
- **HSK Type** : HSK50A, HSK63A, HSK100A
- **SK Type** : SK30, SK40, SK50
- **NT Type** : NT40, NT50
- **DBT Type** : DBT30, DBT40, DBT50

BT Type | HSK Type | SK Type | NT Type | DBT Type

High precision

- Run out accuracy within 15㎛ in the case of L/D=3
- Clamp inner diameter (Clamp I.D.) accuracy within 5㎛

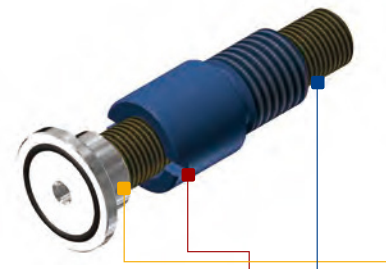


Runout within 15㎛ (measurement location : 3D)

Internal coolant applicable

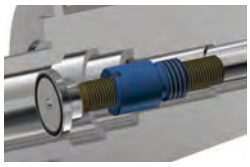
NPM + CTC (Option) = Internal coolant application system

Internal refueling system



- **HSK shank is not available**
- **Add specifications of the CRS if not the basic application is adopted**

  EX) CTC20-6 : Nut + Screw + CSR-6 (Change to the Coolant Stop Ring specifications wanting to use instead of a basic model)

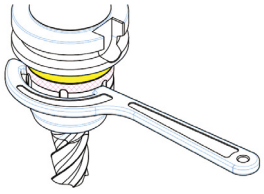


SPEC	NUT	SCREW	COLANT STOP RING	Inner diameter (Ø)	Applicable shank	Remarks
CTC32(M16)-□□	CBN-M16N	CAS-M12	CSR-00	20, 25, 32	#30, 40, 50	#50is not applicable to Inner diameter Ø32
CTC32(M24)-□□	CBN-M24N			32, 42	#50	

※ The above is an example.

⚠ CAUTION

- Be sure not to use a spanner with a pipe, etc. inserted when tightening a milling chuck.
- Excessive clamping can deform and/or adversely affect a cutting tool.
- When tightening a cutting tool, be sure not to touch it with bare hands.
- When using a collet, push it all the way into the milling chuck.
- If the insertion depth of the collet is not normal, the tool such as an end mill, etc. may fall out and/or the milling chuck may be internally damaged.
- In case of NPM milling chuck failure, do not disassemble it arbitrarily
- In case of a problem arising out of arbitrary disassembly, remember that no adjustment will be provided.



Removable within an average of 2.5 turns

SDC/P

Precision collet chuck for multi purpose machining

Ø26	C	ER	Milling	Drilling	Tapping	Chamfering
Max Dia	Coolant System	ER collet				

Features

- Improved precision (higher than conventional SDC)
- Simpler model number management than conventional SDC due to its organized gauge line
- Collet chuck suitable for multi-purpose machining with SWISS-MADE sleeve nut adopted
- Boring range : Ø1~Ø25

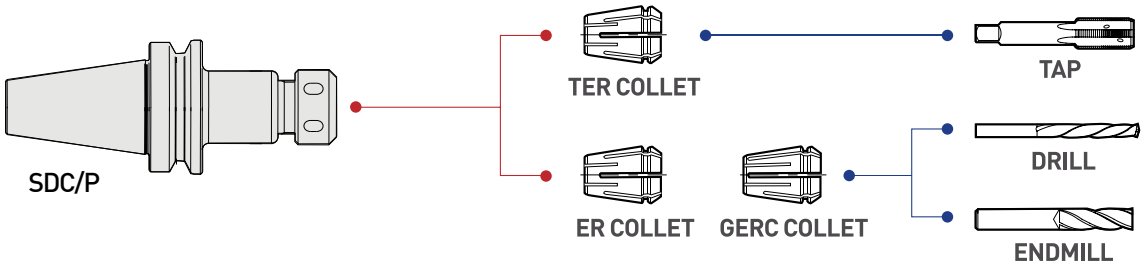
NAMING

BT30	–	SDC	10	P	–	100
Spindle		Collet chuck	Tool Dia.	Precision		Length

Best functional Nut(SWISS made)

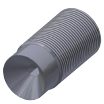
Before		After	
	General R/RU Nut		Soft sleeve bearing RN Nut

SDC/P Application



SPARE PART

Main components

Chuck	Main components	
	Sleeve bearing nut	Adjust screw
TYPE		
SDC 7P	RN11	BN0716F
SDC 10P	RN16	BN1025F
SDC 13P	RN20	BN1325F
SDC 16P	RN25	BN1830F
SDC 20P	RN32	BN2230F
SDC 26P	RN40	BN2838F

For separate purchase

Chuck	For separate purchase	
	Spanner	Collet
TYPE		
SDC 7P	20-22	GERC/ER 11-ØD
SDC 10P	32-35	GERC/ER 16-ØD
SDC 13P	35-38	GERC/ER 20-ØD
SDC 16P	42-46	GERC/ER 25-ØD
SDC 20P	48-52	GERC/ER 32-ØD
SDC 26P	62-65	GERC/ER 40-ØD

DSK

Slim type collet chuck

Ø26	C	ER	Milling	Drilling	Tapping	Chamfering
Max Dia	Coolant System	ER collet				

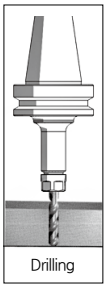
Features

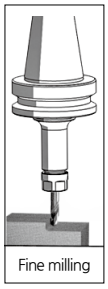
- Enables balanced G6.3/ a maximum of 15,000RPM machining
- Minimized tool vibration during machining by adopting an 8-degree collet
- Provides optimal machining stability by applying Swiss Made nuts
- Tool clamping range : Ø2~Ø25

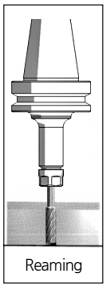
NAMING

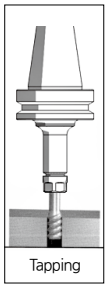
BT30	–	DSK	10	–	90
Spindle		Slim type Collet Chuck	Tool Dia.		Length

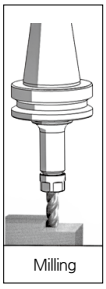
Multipurpose operation

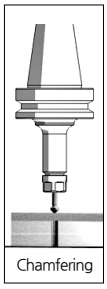

Drilling


Fine milling


Reaming

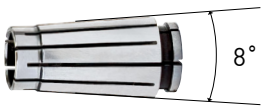

Tapping


Milling


Chamfering

Collet

General type & Precision type	Model No.	Max Chacking	Runout
	HC6 - ØD	6.0	General type 5μm Precision type 3μm
	HC10 - ØD	10.0	
	HC13 - ØD	13.0	
	HC16 - ØD	16.0	
	HC20 - ØD	20.0	
	HC25 - ØD	25.0	

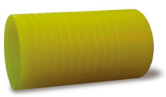
8° HC Collet

Minimizes tool vibration during machining

Spanner(optional)

	Model No.	Chuck
	DSS - 6	DSK 6
	DSS - 10	DSK 10
	DSS - 13	DSK 13
	DSS - 16	DSK 16
	DSS - 20	DSK 20
	DSS - 25	DSK 25

Spanner

Collet extract tool

	Model No.	Chuck
	DSS - 6CE	DSK 6
	DSS - 10CE	DSK 10
	DSS - 13CE	DSK 13
	DSS - 16CE	DSK 16
	DSS - 20CE	DSK 20
	DSS - 25CE	DSK 25

Collet Extractor

C Internal coolant system is optional.

GSK

Great speed slim collet chuck

G2.5	25,000	Ø25	C	HC	Milling	Drilling
G value	Max RPM	Max Dia	Coolant System	HC collet		

Features

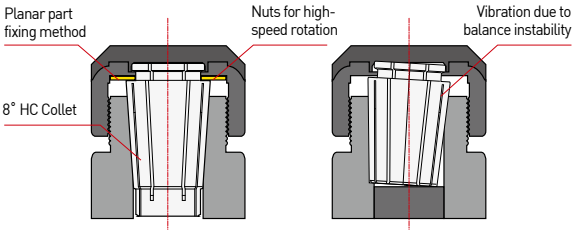
- Enables balanced G2.5/ a maximum of 25,000RPM machining
- Improves machining productivity by high-speed machining
- Minimized tool vibration during machining by adopting an 8-degree collet
- The collet is pressed steadily by the Swiss Made high-accuracy nut.
- Optimal machining stability
- Tool clamping range : Ø2~Ø25

NAMING

BT40	–	GSK	10	–	90
Spindle		Great Speed Silm collet chuck	Tool Dia.		Length

Unique Design

GSK	Third party

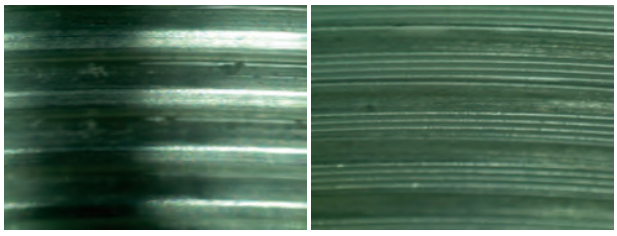


Provides strong tightening force with a 8° collet and good fixation degree based on planar part fixing method

Unstable balance is generated by the centrifugal force at the time of high-speed rotation

Comparison of screw polishing at points of nut tightened

GSK	Third party

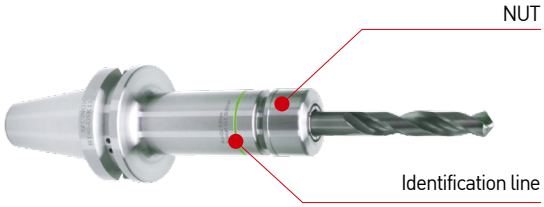


Provides excellent reproduction precision through screw grinding

Unstable precision due to turning operation

Special Design

Optimized for great-speed collet chucks and uniquely designed to enable easy runout measurement by designating the test bar area to the product



Spanner(optional)

Model No.	GSK
GSK6 SPANNER	GSK6
GSK10 SPANNER	GSK10
GSK13 SPANNER	GSK13
GSK16 SPANNER	GSK16
GSK20 SPANNER	GSK20
GSK25 SPANNER	GSK25

C Internal coolant system is optional.

1:1 Chat

OFH

Floating holder for brush

G6.3	15,000	2~8N	C	
G value	Max RPM	Load	Coolant System	Deburring

Features

- Can be used consistently as a dedicated arbor (floating function) with steady pressure
- G6.3 , Max RPM 15,000rpm
- Provides a longer brush service life (about 50% increase versus collet chuck)
- Reduces lead time and improves productivity
- Various sizes of sleeves and brushes can be used

NAMING

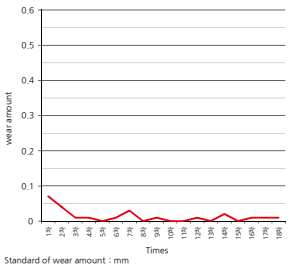
BT30	–	OFH	6	–	75
Spindle		Floating holder for brush	Brush Dia.		Length

Integral exclusive tool

Sleeve compatible tool

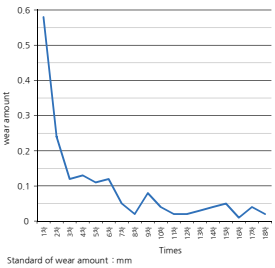
Comparison of brush wear performance

OFH Floating Holder



Can be used consistently due to a steady wear loss

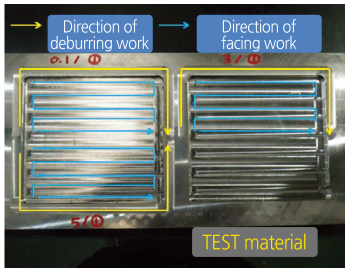
General Collet Chuck

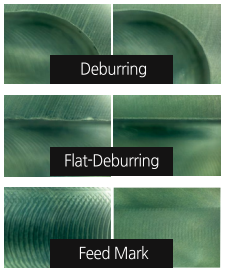


Brush service life shortened due to an abrupt wear loss

Deburring after cutting aluminium

Pocket

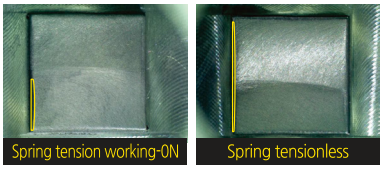




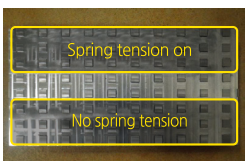
Surface roughness improved about 4 times

0.906㎛ (before application) → 0.179㎛ (after application)

Boss



Workpiece defect wear area **reduced about 2.5-times**



Brush wear loss **reduced about 3 times**
(*based on the entire area applied wear loss)
=〉(Total wear loss) 0.18mm
=〉(Total wear loss) 0.59mm

DST PAT.

High speed synchro tapping chuck

Features

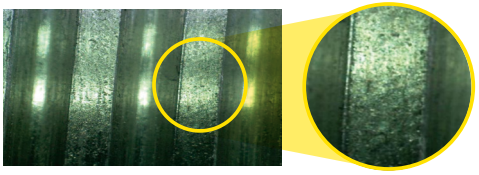
- Tapping chuck for high speed machining
- Specially designed to absorb thrust load to provide tap damage prevention and a longer tool service life
- Internal coolant applicable
- Boring range : M1~M22

NAMING

BT40	–	DST	22	–	110
Spindle		Tapping holder	Tapping Range		Length

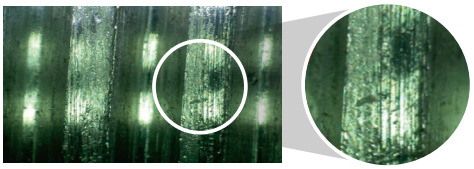
Precise machining

Machining range expanded



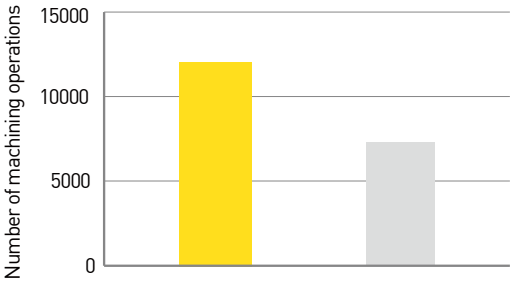
DST22
(V=100 m/min)

Improved thread quality



Conventional products

M1.4x0.3 service life test

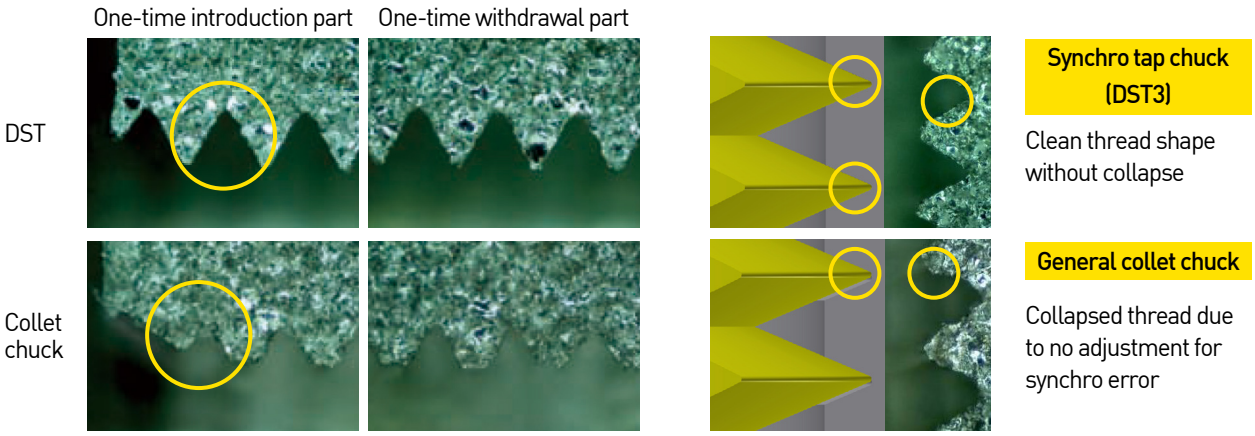


Increased tool service life versus collet chuck use

Tapping dedicated collet

- In the case of tapping, it is recommended to use TER collet.
- DST3 : ER11 collet used

Comparison of Thread shape



Synchro tap chuck (DST3)

Clean thread shape without collapse

General collet chuck

Collapsed thread due to no adjustment for synchro error

C Internal coolant system is optional.

1:1 Chat

DTN

Tapping holder

C
Coolant System

Tapping

Features

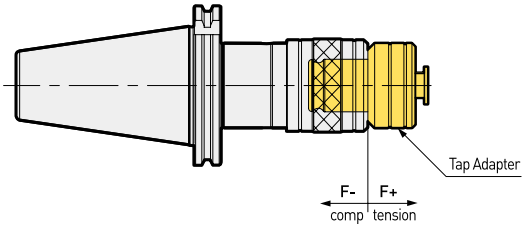
- Fast and convenient tool change
- Using an adapter with a tensile and shrinking device
- Boring range : M3~M38

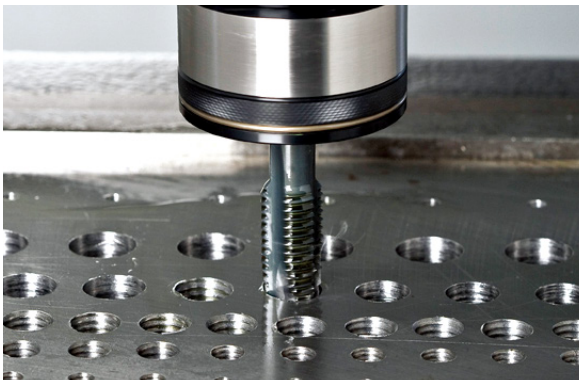
NAMING

BT40	–	DTN	22	–	130
Spindle		Tapping holder	Tapping Range		Length

Easy TCA (Tap adapter) change

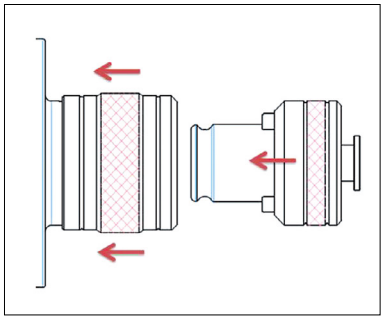
- Fast tap change per adapter pi based on the one-touch change method that enables high accuracy and a long service life and useful for various machining operations
- Enables tension and contraction using the axial direction floating method





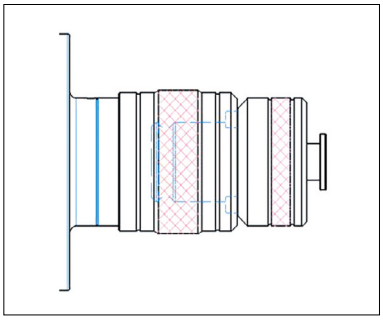
How to tighten

TCA insertion



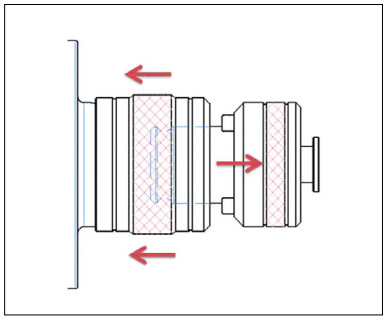
1. Insert TCA after pressing the tap holder cover down
2. Connect TCA to be aligned with the key groove and press it until the sound "click" is heard.

TCA mounting



1. The tap holder cover is put in the normal position.

TCA removal



1. Remove TCA after pressing the tap holder cover.

C This product does not support the internal coolant system.

※ DTN12, DTN22 : Remove them by pulling the sliding ring down.

※ DTN38 : Remove it by pulling the adapter forward.

FBH/B

FBH Back boring & balanced type

G6.3 (G value) | C (Coolant System) | Boring

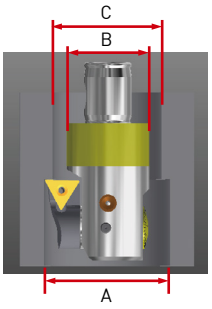
Features

- High-speed boring and back boring applicable
- High-precision balanced boring: G6.3
- Minimum adjustment range: 2㎛

NAMING

FBH	32	33	B
Fine boring head	MD Arbor Size	Boring Range(Min)	Balance type

Back boring range calculation



- A : Boring range(Ø)
- B : FBH/B BODY Size(Ø)
- C : Diameter for pass(Ø)

Model No.	Min. diameter for pass(Ø)'C'
FBH1920B	≥Ø24
FBH2526B	≥Ø30.5
FBH3233B	≥Ø35
FBH4042B	≥Ø44
FBH5053B	≥Ø54
FBH6368B	≥Ø71.5
FBH6398B	≥Ø100
FBH8098B	≥Ø100

A	Max. range of back boring (Ø)	A Max. value = (2xC)-B
B	Max. FBH body size (Ø)	B Max. value = (2xC)-A
C	Min. diameter for pass (Ø)	C Min. value = (A+B)/2

Dial adjustment

Fine adjustment : 2㎛ boring range

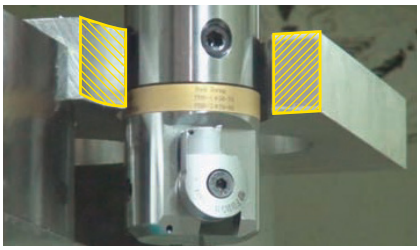
Can be adjusted at a rate of 2㎛ by using the main scale and vernier scale

Initial position | 0.002 Adjustment location | 0.004 Adjustment location

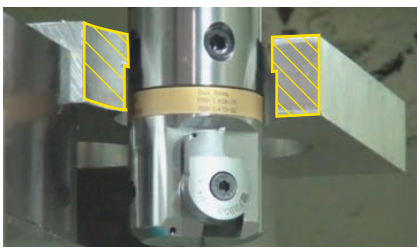
0.006 Adjustment location | 0.008 Adjustment location | 0.010 Adjustment location

Back boring machining

Before machining



After machining



Convertible for machining direction

In case of boring machining

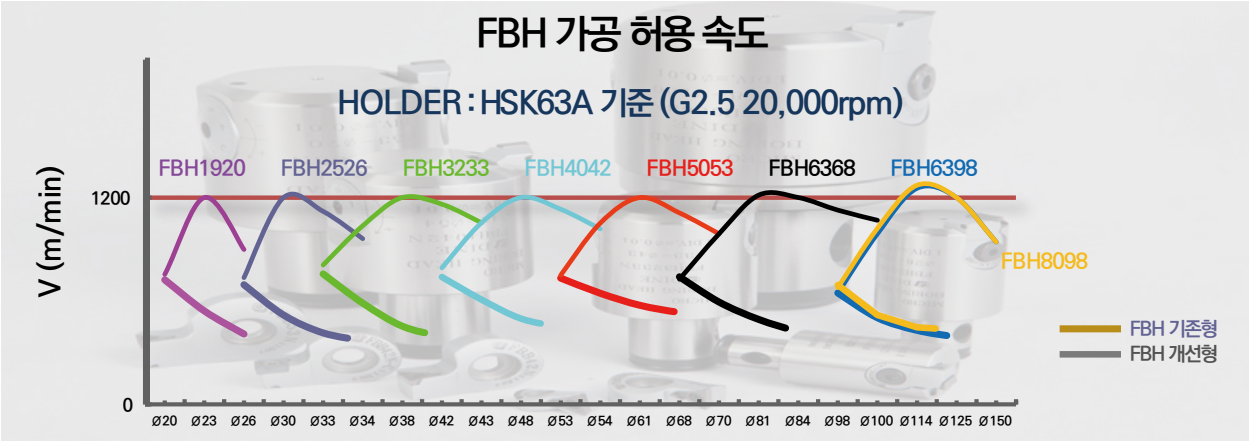
In case of back boring machining

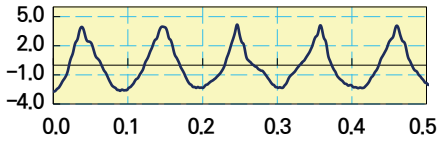
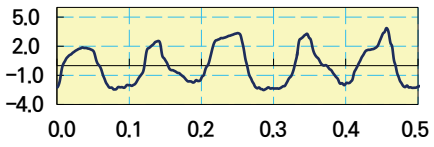
* Boring direction can be easily shifted simply by changing the bite direction

FBH/B

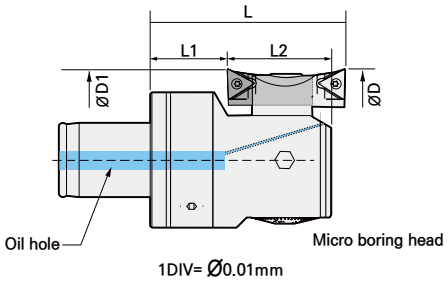
FBH Back boring & balanced type

Test Results



Chuck	Model No.	FBH2526B	FBH2526N
	V(m/min)	732 (6,861rpm)	
HSK63A-MD25F-60	Difference in surface roughness		
		- Constant and regular cycles are shown on the graph - Indicates stable boring work at high cutting speed	- Irregular cycles shown on the graph - Indicates unstable boring work at high cutting speed

Boring range



Model No.	Boring Range(Ø)			Backboring Range(Ø)			
	Min.	Max.	L	Min.	Max.	L1	L2
FBH1920B	20	26(30)	35.3	29	30	13.1	18.6
FBH2526B	26	34(40)	40.9	36	40	15.1	21.9
FBH3233B	33	43(50)	40.9	38	43(50)	13.1	24.9
FBH4042B	42	54(62)	50.4	48	54(62)	15.2	31.4
FBH5053B	53	70(82)	58.4	58	70(82)	15.7	38.4
FBH6368B	68	100(122)	80.6	78	100(122)	27.4	48.6
FBH6398B	98	150(172)	100.6	106	150(172)	47.4	48.6
FBH8098B	98	150(172)	100.6	106	150(172)	47.4	48.6

DBCA

New balance cut tool

C	28	130	
Coolant System	MIN Range	MAX Range	Boring

Features

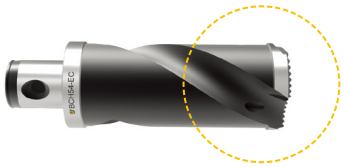
- Applied adjustment function simultaneously in Bi/Uni-direction of Cartridge
- Improves the rigidity of cutting by applying Cover for rotating type
- Increased machining area versus conventional own products
- Improved capacity to evacuate chips by unique design of Helical Type Head
- Boring range : Ø28 - Ø136

NAMING

DBCA	32	33	S	H
New balance cut tool	MD Arbor Size	Min. boring dia.	Straight type	H: Helical type, Non: Straight type

Main features

Helical Type



- Improved capacity to discharge chips from clogged and deep holes
- Minimized damage to tools and insert due to chip clogging

Extended head length	Deep hole machining implemented
Helical Type	Improved capacity to discharge chips from holes

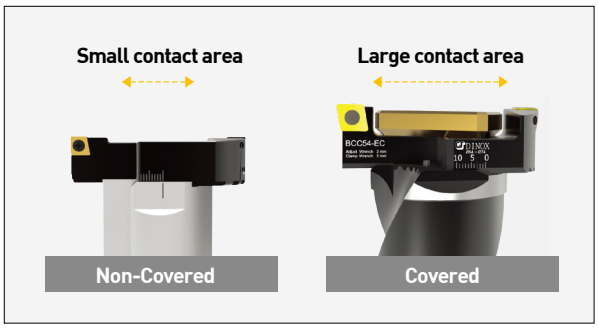
Boring area optimization

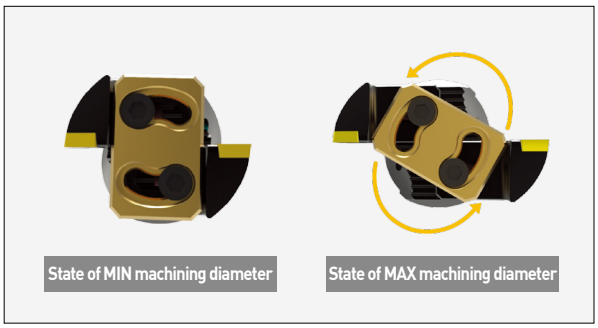
- Max. diameter expanded owing to reinforced rigidity
- Boring range expanded per model no. versus conventional boring range of DINE

Coolant Hole (Direct spray to cutting edge)	• Improved capacity to discharge chips • Improved capacity of machining

Effect of improved rigidity for Cartridge by Cover

Clamps the top of the cartridge stably, minimizing the vibration of tools and improving the roughness of the working surface





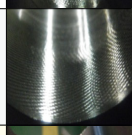
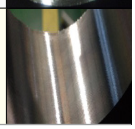
DBCA

New balance cut tool

Comparison with competitors

Verifying of less vibration due to improved rigidity and smooth chip discharge

→ Superior performance compared to competitors

MANUFACTURER	L/D	SURFACE ROUGHNESS (RA)	SPECIAL NOTES	MACHINED SURFACE
Company A	5D	3.82	Vibration occurred	
Company B	5D	2.46	Vibration occurred Chips tangled	
DINE took over	5D	2.19	Well-machined surface No chip tangled	

New machining range versus old machining range of DINE

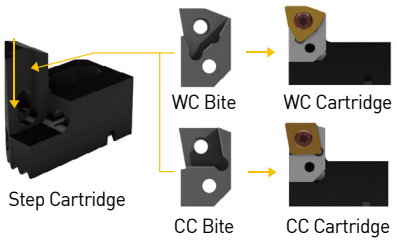
OLD TYPE

Designation	Boring Range ØD	
	min	max
DBC2528S	28	35
DBC3235S	35	46
DBC4046S	46	58
DBC5058S	58	74
DBC6347S	74	94
DBC8094S	94	120

NEW TYPE

Designation	Boring Range ØD	
	min	max
DBCA2528S-H	28	38
DBCA3238S-H	38	54
DBCA5054S-H	54	74
DBCA6374S-H	74	100
DBCA80100S-H	100	130

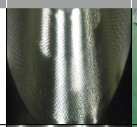
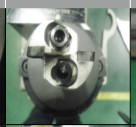
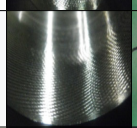
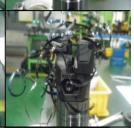
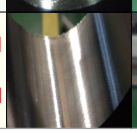
Detailed Specifications



Designation	Cartridge (Standard)	Step Cartridge	Step Cartridge Bite	
			CC Type	WC Type
DBCA2528S-□	BCC28-EC	BCC28SB	SBB28-CC	SBB28-WC
DBCA3238S-□	BCC38-EC	BCC38SB		
DBCA5054S-□	BCC54-EC	BCC54SB	SBB54-CC	SBB54-WC
DBCA6374S-□	BCC74-EC	BCC74SB	SBB74-CC	SBB74-WC
DBCA80100S-□	BCC100-EC	BCC100SB		

Comparison with competitors

MACHINING CONDITIONS	Vc(m/min)	f(mm/rev)	ap(mm)	MATERIAL	ITEM	DEPTH OF HALL
	200	0.08	2	S45C	Penetration hall	30

MANUFACTURER	Insert	GAUGE LINE (HEAD+SHANK)	BORING DIAMETER	L/D	SURFACE ROUGHNESS (RA)	SPECIAL NOTES	MACHINED SURFACE	TOOL TOP	TOOL SIDE
Competitor A	SCMT09T0304	164	Ø35	4.68	3.82	Vibration occurred			
Competitor B	CCMT080204	180	Ø35	5.14	2.46	Vibration occurred Chips tangled			
DINE	CCMT060204	175	Ø35	5	2.19	Well-machined surface No chip tangled			

TBCA NEW

Wide Diameter Boring system

C	AL	130	615	
Coolant System	Material	MIN Range	MAX Range	Boring

Features

- Convenience in use simultaneously (available both inside and outside)
- Broad boring diameter and range
- Rough / Finishing boring with replaceable cartridge and common rail
- Boring range for outer diameter: Ø0~Ø395
- Boring range for inner diameter: Ø130~Ø631

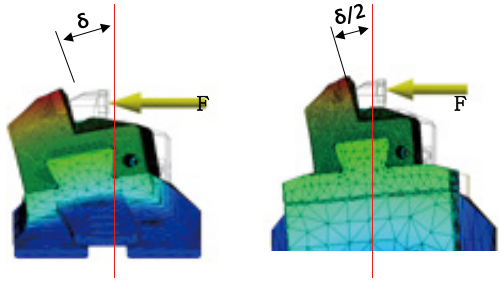
NAMING

BODY			HEAD SET		
BT50	FMC40	50	TBC	130	A
Spindle	Facemill arbor	length	Balance cut tool	Minimum Boring Range	Advance

Main Features

Reinforced rigidity

- 50% less moment strain (versus the conventional product of DINE)



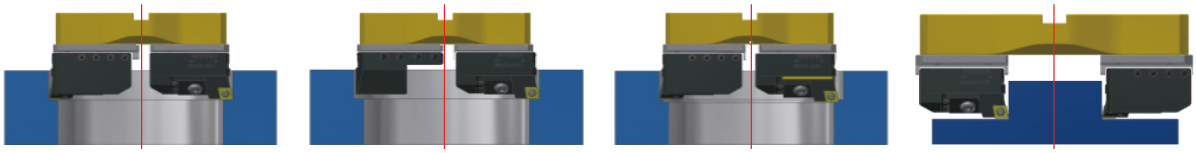
TBC460 (old type) TBC460A (new type)

Lightweight design (HEADSET)

- BCC(Cartridge)+DBR(Bridge)+DBB(Rail)

TBC130A	TBC175A	TBC220A	TBC265A
4.2Kg	5.6Kg	6.6Kg	7.5Kg
TBC310A	TBC385A	TBC460A	TBC535A
9.5Kg	11.6Kg	14Kg	16Kg

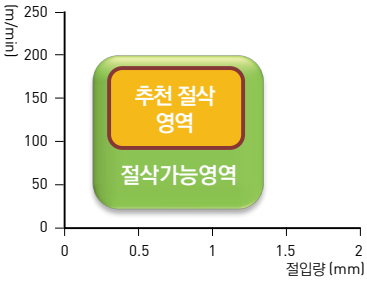
APPLICATION



Twin edge boring | Single edge boring | Step boring | Outside boring

Performance test

Product	Workpiece		Boring diameter (Depth of cutting)	Results
	Product name	Material	mm	Machining
Conventional tool of DINE	Housing	Cast iron	Ø465 (Rd=7)	· Vibration occurred · Insert damaged in the machining process · Scratched surface of workpieces
TBC460A Applicable insert CNMG19	Housing	QT400	Ø508~527 (Rd=10)	· No chattering · No vibration found · Goal of accuracy achieved · Normal chip discharged

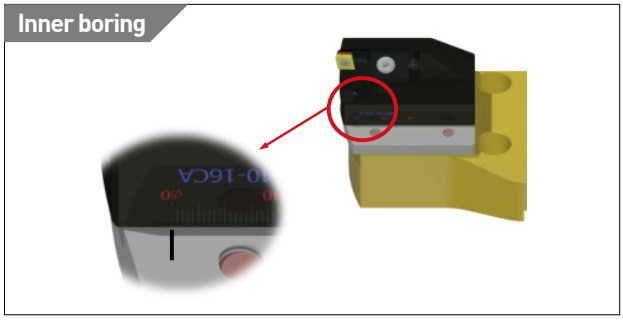


TBCA NEW

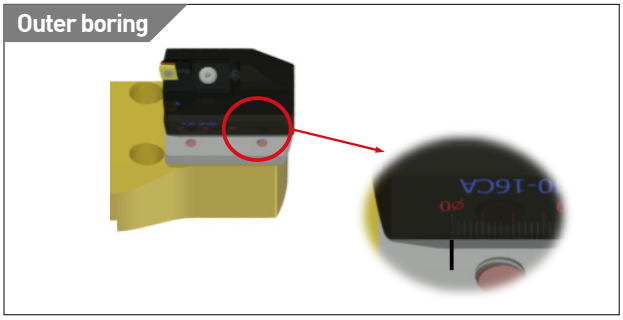
Wide Diameter Boring system

Convenience

Inner boring

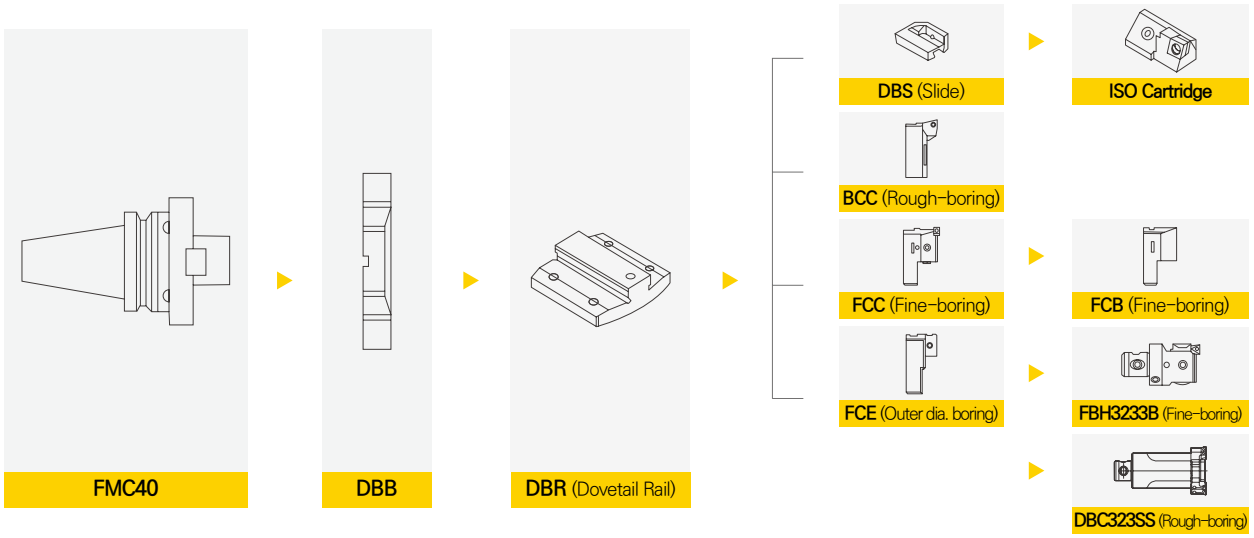


Outer boring

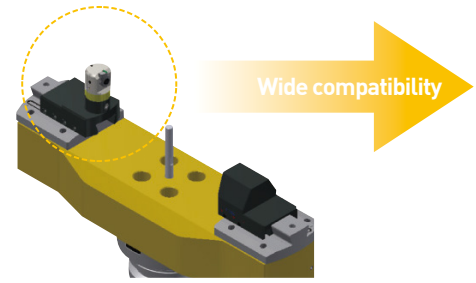


- Inner boring and outer boring can be performed by easily changing the cartridge direction
- With the scale marking on the rail, the boring diameter can be set easily.

Boring system map

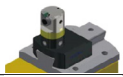
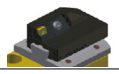
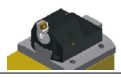
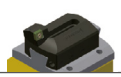


Wide compatibility



Workpiece outer dia. boring

Workpiece outer dia. boring

IMAGES		List of clamping parts	Cutting type
Outer dia. boring		FBH3233B+FCE310+FCB310	Finishing boring
		DBCA3235S + FCE310 + FCB310	Rough boring
Inner dia. boring		DBS□□ -□□CA+SCGCL16C-1A2	Rough boring
		FCC310	Finishing boring
		BCC1354	Rough boring

※ TBC310A in case

TBC

Balance cut tool for Rough boring

C | 130 | 540 | Boring

Coolant System | MIN Range | MAX Range | Boring

Features

- Broad boring diameter and range
  - Wide Boring Range : Ø130 ~ Ø540mm
- Structurally stable enough to resist cutting load
  - Provides strong cutting performance based on the precision grinding dovetail method
- Can perform fine boring operation by changing boring head cartridges
  - Compatible boring head and rail as they are in the same structure
- Various cartridge tip angles - cartridge fore end angles 15° and 45° selectable

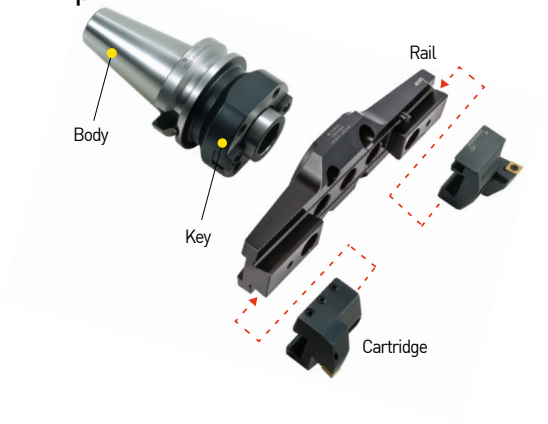
NAMING

HOLDER(option)

BT50	–	FMD50	–	85
Spindle		Basic holder		length

Structure and main features of TBC Boring Tool

Names of each part of TBC



Cartridge : BCC1348
Insert : CCMT1204□□
CNMG1204□□

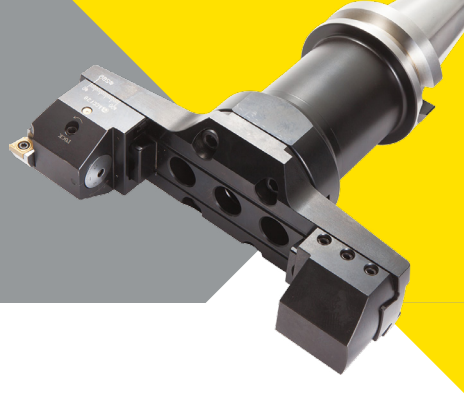
Rail : TBR□□
Weight reduced and space for chip discharge secured by removing the side part

Boring Range of TBC Boring Tool

Model No.	Dia(Ø) Boring diameter		Head set	Insert
	min	max		
TBC130	130	180	TBC130(TBR130+BCC1348+BCC1348)	CCMT1204□□
TBC175	175	225	TBC175(TBR175+BCC1348+BCC1348)	CCMT1204□□
TBC220	220	270	TBC220(TBR220+BCC1348+BCC1348)	CCMT1204□□
TBC265	265	315	TBC265(TBR265+BCC1348+BCC1348)	CCMT1204□□
TBC310	310	390	TBC310(TBR310+BCC1348+BCC1348)	CCMT1204□□
TBC385	385	465	TBC385(TBR310+BCC1348+BCC1348)	CCMT1204□□
TBC460	460	540	TBC460(TBR460+BCC1348+BCC1348)	CCMT1204□□

FBC

Balance cut tool for fine boring



C | 130 | 540 | Boring

Coolant System | MIN Range | MAX Range

Features

- Broad boring diameter and range
  - Wide Boring Range : Ø130 ~ Ø540mm
- Structurally stable enough to resist cutting load
  - Provides strong cutting performance based on the precision grinding dovetail method
- Can perform rough boring operation by changing boring head cartridges
  - Compatible boring head and rail as they are in the same structure
- Various cartridge tip angles
  - cartridge fore end angles 15° and 45° selectable

NAMING

HOLDER(option)

BT50 – FMD50 – 85

Spindle | Basic holder | length

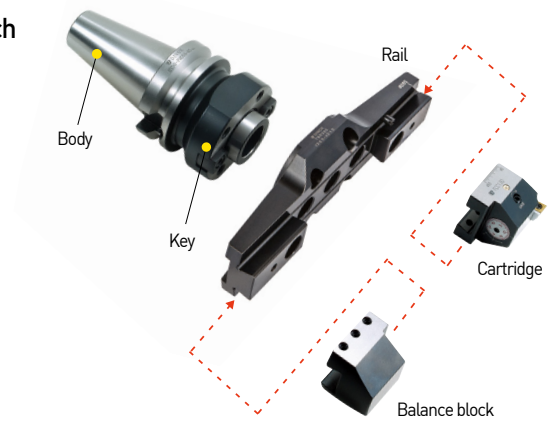
HEAD SET

FBC 130S

Balance cut tool | Minimum Boring Range

Structure and main features of FBC Boring Tool

Names of each part of FBC



Cartridge : FCC130
Insert : CCGT09T3□□
CCMT1204□□
TPGT1103□□

Balance block : FCB130

Boring range of FBC Boring Tool

Model No.	Dia(Ø) boring diameter		Head set	Insert
	min	max		
FBC130	130	180	FBC130S(TBR130+FCC130+FCB130)	FBB130-C09(CCMT09T3□□, CCGT09T3□□) FBB130-C12(CCMT1204□□) FBB130-T11(TPMT1103□□,TPGT1103□□L)
FBC175	175	225	FBC175S(TBR175+FCC130+FCB130)	
FBC220	220	270	FBC220S(TBR220+FCC130+FCB130)	
FBC265	265	315	FBC265S(TBR265+FCC130+FCB130)	
FBC310	310	390	FBC310S(TBR310+FCC310+FCB310)	
FBC385	385	465	FBC385S(TBR385+FCC310+FCB310)	
FBC460	460	540	FBC460S(TBR460+FCC310+FCB310)	

Application example of Special FBC Boring Tool

Material	Cutting speed V	RPM	FEED		Cutting depth Ø (mm)	Boring diameter Ø (mm)
			(mm/min)	(mm/rev)		
Aluminium	200	48	5	0.1	0.5	Ø1300
	200	48	10	0.1	2	Ø1300
	500	120	12	0.1	2	Ø1300

ANGULAR HEAD

Angular head

MAH

Rigidity-reinforced side lock type MAH (Reinforced series) / Angle adjustment type angular head

MAH that supports mold machining by improving the performance of the current universal-type product

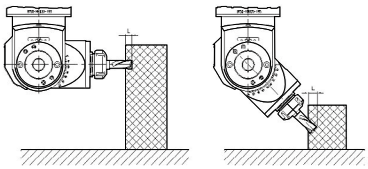
- Stable machining of large-sized mold
- Supports ball endmill 32mm in diameter (D)
- Improves the rigidity of the KHU type

KHU

Collet type KHU (Free angle) / Angle adjustment type angular head

Wide machining angle range from 0°to 90°

- HSK and SK types are customizable.



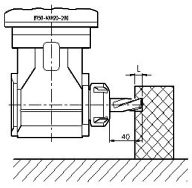
BT50-KHU20-195

KAH

Modular type KAH (90˚type) / Fixed angle-type angular head

Availability in adjusting horizontal machining angle up to 360°.

- To use Tap-exclusive collet, please contact us in advance.
- HSK and SK types are customizable



BT50-KAH20-200

ANGULAR HEAD

Angular head

HRAG

Attachment type HRAG(Reinforced type) / Attachment-type angular head

HRAG that improves the rigidity of the attachment-type bracket by 200%

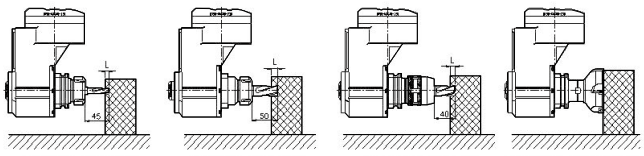
- Provides stable operation of the face mill cutter
- Improves the rigidity of the KAG type

KAG

Attachment type KAG / Attachment-type angular head

Wide horizontal machining angle range from 0° to 360°

- Compatible with various tools for BT40 and BT30.
- HSK and SK types are customizable.



KAC

Modular type KAC (45˚type) / Fixed angle-type angular head

Availability in adjusting horizontal machining angle up to 360°.

- HSK and SK types are customizable.

BT-SAH

Slim Angular Head

MAS 403-BT	3,500	Milling	Drilling	Flank mashining	Inner side mashining
Shank	Max RPM				

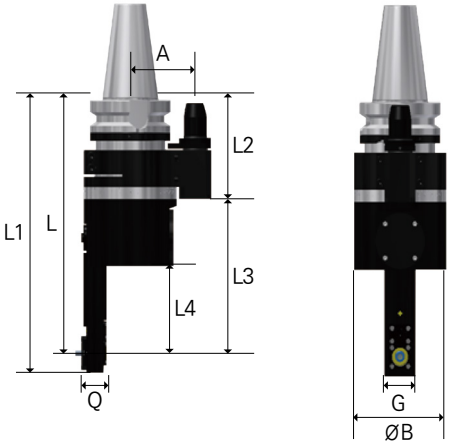
Features

- Angular head for narrow inside boring (min. inner diameter of workpiece: Ø40, min. boring width: 32mm)
- MAX 3,500RPM, Spindle: applied rotation ratio = 1:1.37
- Boring range: Ø3, Ø4, Ø6

NAMING

BT50	–	SAH	6	–	277
Spindle		Slim Angular head	Tool Dia.		Length

Details



Machining Features

Min. Ø40 Hole
(except tool projection)

Min.32mm gap
(except tool projection)

Item	L	L1	L2	L3	L4	A	Q	G	ØB	Rotation ratio (IN:OUT)	Rotation direction	MAX RPM	Weight (Kg)
BT50-SAH6-277	277	298	183.5	166.5	93.5	80(110)	31.5	40	76	1:1.37	CW:CW	3,500	14

Clamping Force

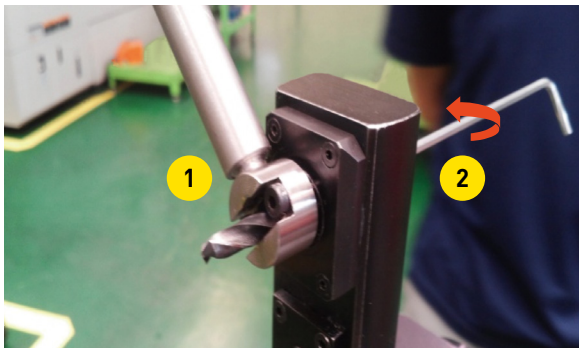
	Measurement	Measured value (N-m)			
Clamp torque	2	2.5	3	3.5	4
Clamping Force	Not measurable	5.5	6.5	7	7

※ The moderate clamp torque of collet is 3.5N-m.

Exclusive collet

Model No.	Clamping Range
SAH6-C3	3
SAH6-C4	4
SAH6-C6	6

How to clamp



1. Couple the tool with SAH dedicated collet
2. Insert the coupled tool into SAH and fix it with a dedicated tightening jig
3. Turn the bolt using a hexagonal wrench

ROT

Run-out tester

ISO

Shank 200mm=3㎛

Product Features

- Compatible with various shanks; provides diverse lineups
  - Compliant with ISO30~ISO50 (ISO: BT,SK, NT,CAT) affordable general type and multi-type that can measure the cutting edge height and outer diameter simultaneously

Model No.

ROTS	ROTM
ROTS-ISO15	ROTM-ISO15
ROTS-ISO20	ROTM-ISO20
ROTS-ISO25	ROTM-ISO25
ROTS-ISO30	ROTM-ISO30
ROTS-ISO40	ROTM-ISO40
ROTS-ISO50	ROTM-ISO50

Description

Main component				Separate sale	
Shank	Housing	Retainer	Test bar	arm	Indicator
ISO15	ROTM-BD (Multi type), ROTS-BD (Basic type)	ROT-HS-ISO15	ROT-RTB-ISO15	MB -1030-2	DIAL GAUGE (0.002mm)
ISO20		ROT-HS-ISO20	ROT-RTB-ISO20		
ISO25		ROT-HS-ISO25	ROT-RTB-ISO25		
ISO30		ROT-HS-ISO30	ROT-RTB-ISO30		
ISO40		ROT-HS-ISO40	ROT-RTB-ISO40		
ISO50		ROT-HS-ISO50	ROT-RTB-ISO050		

Simple measurements

Measure run-out easily by inserting and turn the tool

① After inserting the tool

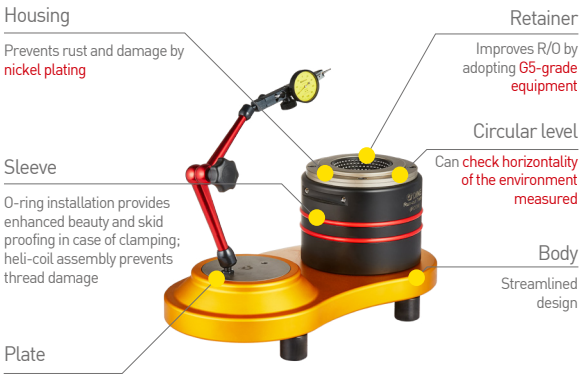
② Check R/O by turning the tool

Convenient horizontal adjustability

Can check horizontality by the level installed.

ROTS-General type (~Ø150)

ROTM-Multi type (~Ø400)

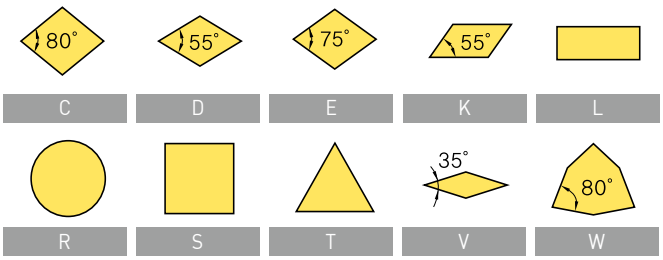


How to indicate the model no. of insert (ISO)

C	N	G	M
1	2	3	4
Insert shape	Major clearance angle	Tolerance	Cross-sectional shape

1 Insert shape

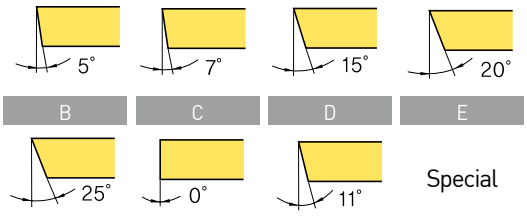
C N G M 12 04 08 - VM



C D E K L R S T V W

2 Major clearance angle

C N G M 12 04 08 - VM

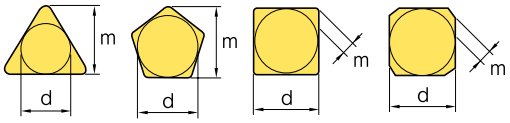


B C D E F N P Special O

3 Tolerance

C N G M 12 04 08 - VM

d : Diameter of inscribed circle
t : Insert thickness
m : Refer to the figure



(mm)

Class	d	m	t
A	±0.025	±0.005	±0.025
C	±0.025	±0.013	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J *	±0.05 ~ ±0.15	±0.005	±0.025
K *	±0.05 ~ ±0.15	±0.013	±0.025
L *	±0.05 ~ ±0.15	±0.025	±0.025
M *	±0.05 ~ ±0.15	±0.08 ~ ±0.20	±0.13
N *	±0.05 ~ ±0.15	±0.08 ~ ±0.18	±0.025
U *	±0.08 ~ ±0.25	±0.13 ~ ±0.38	±0.13

* Side is the one of the sintered parts

Tolerance definition of C, H, R, T, and W types of inscribed circle (Exceptions)

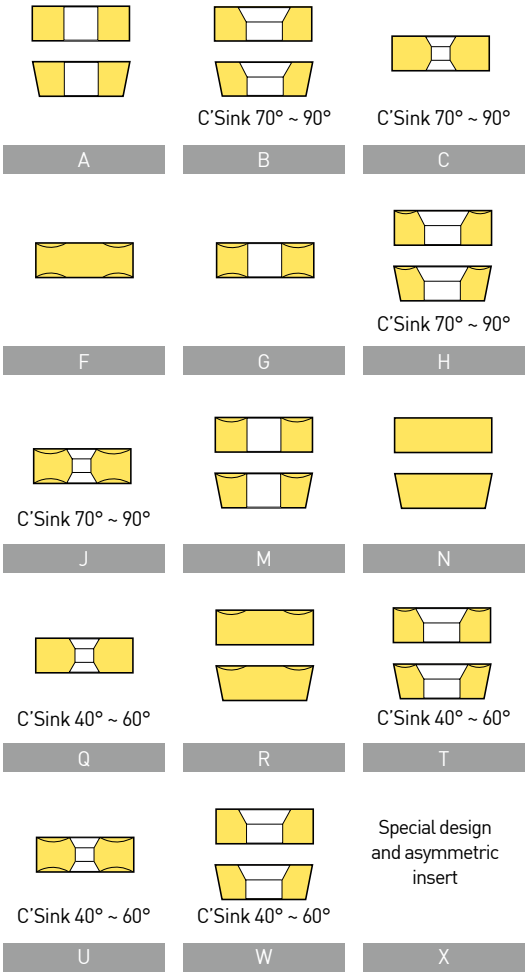
d	Tolerance of d		Tolerance of m	
	J, K, L, M, N	U	M, N	U
6.35	±0.05	±0.08	±0.08	±0.13
9.525	±0.05	±0.08	±0.08	±0.13
12.7	±0.08	±0.13	±0.13	±0.20
15.875	±0.10	±0.18	±0.15	±0.27
19.05	±0.10	±0.18	±0.15	±0.27
25.4	±0.13	±0.25	±0.18	±0.38

Tolerance definition of D-type inscribed circle (Exceptions)

d	Tolerance of d	Tolerance of m
6.35	±0.05	±0.11
9.525	±0.05	±0.11
12.7	±0.08	±0.15
15.875	±0.10	±0.18
19.05	±0.10	±0.18

4 Cross-sectional shape

C N G M 12 04 08 - VM



A B C F G H J M N Q R T U W X

How to indicate the model no. of insert (ISO)

12	04	08	GA
5	6	7	8
Cutting edge length, Inscribed circle diameter	Cutting edge height	Nose "r" size	Chip breaker

5 Cutting edge length, Inscribed circle diameter

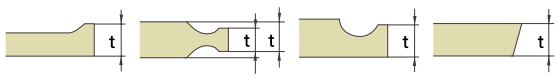
C N G M **12** 04 08 - GA

( ) small symbols

Symbols							Inch	IC
C	d	S	T	R	V	W		
Symbols								d(mm)
03	04	03	06	03	-	02	1.2(5)	3.97
04	05	04	08	04	08	S3	1.5(6)	4.76
05	06	05	09	05	09	03	1.8(7)	5.56
-	-	-	-	06	-	-	-	6.00
06	07	06	11	06	11	04	2	6.35
08	09	07	13	07	13	05	2.5	7.94
-	-	-	-	08	-	-	-	8.00
09	11	09	16	09	16	06	3	9.525
-	-	-	-	10	-	-	-	10.00
11	13	11	19	11	19	07	3.5	11.11
-		-	-	12	-	-	-	12.00
12	15	12	22	12	22	08	4	12.70
14	17	14	24	14	24	09	4.5	14.29
16	19	15	27	15	27	10	5	15.875
-	-	-	-	16	-	-	-	16.00
17	21	17	30	17	30	11	5.5	17.46
19	23	19	33	19	33	13	6	19.05
-	-	-	-	20	-	-		20.00
22	27	22	38	22	38	15	7	22.225
-	-	-	-	25	-	-		25.00
25	31	25	44	25	44	17	8	25.40
32	38	31	54	31	54	21	10	31.75
-	-	-	-	32	-	-	-	32.00

6 Cutting edge height

C N G M 12 **04** 08 - GA

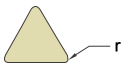


Symbol		Nose "r"	
Metric	Inch	M, N	Inch
01	1(2)	1.59	1/16
T0	1.125	1.79	9/128
T1	1.2	1.98	5/64
02	1.5(3)	2.38	3/32
T2	1.75	2.78	7/64
03	2	3.18	1/8
T3	2.5	3.97	5/32
04	3	4.76	3/16
05	3.5	5.56	7/32
06	4	6.35	1/4
07	5	7.94	5/16
09	6	9.52	3/8
11	7	11.11	7/16
12	8	12.70	1/2

( ) small symbols

7 Nose "r" size

C N G M 12 04 **08** - GA



Symbol		Nose "r"	
Metric	Inch	M, N	Inch
01	0	0.1	0.004
02	0.5	0.2	0.008
04	1	0.4	1/64
08	2	0.8	1/32
12	3	1.2	3/64
16	4	1.6	1/16
20	5	2.0	5/64
24	6	2.4	3/32
28	7	2.8	7/64
32	8	3.2	1/8
00	-	Circular insert (Inch type)	
M0	-	Circular insert (Metric type)	

8 Chip breaker

C N G M 12 04 08 - **GA**

cBN Rough-boring | Fine-boring

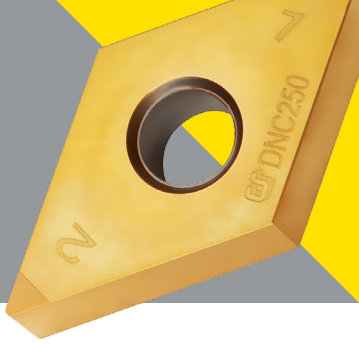
RA | GA

PCD General-purpose

UC

cBN Feature

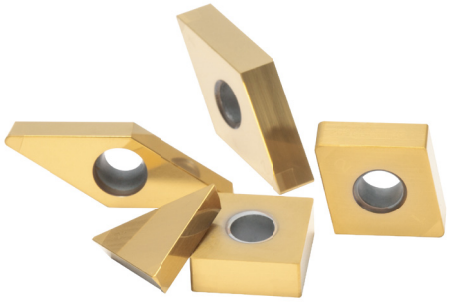
Feature



Features

DINOX cBN features very excellent hardness and thermal resistance by adding special ceramic bonding material to cBN, its main ingredient, and sintering them at an ultrahigh-pressure high temperature. It also provides optimal conditions for productivity improvement through high-speed processing of cast iron and heat-treated steel due to its excellent strength and wear resistance.

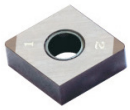
High accuracy **Wear resistance** **Productivity improvement**



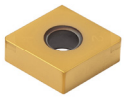
cBN Type

Re-polishing type

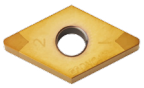
One-use type



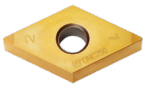
Multi-corner type



Multi-corner type (coating)

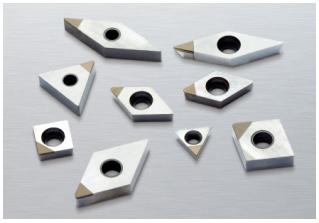


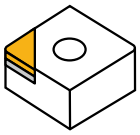
NS Type



NT Type

Re-grinding type

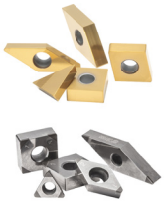




e.g.) CNGA120408

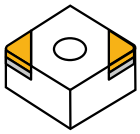
- Stable and long tool life
- Excellent wear resistance, high hardness
- 3~4 time re-polishing is possible, which reduces tool expenses

Multi-corner type (coated/non-coated)



Coated CBN

Non-coated CBN

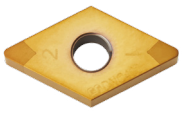


e.g.) 2NU-CNGA120408

- Simple corner management
- Strong welding surface
- Possible to create an effect of several cBNs with one insert

NS, NT Type

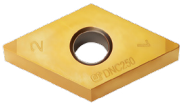
NS Type

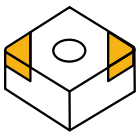


e.g.) 4NS-CNGA120408

- Specialized high cutting depth
- Excellent machining performance in spite of variable cutting depth

NT Type





e.g.) 2NT-CNGA120408

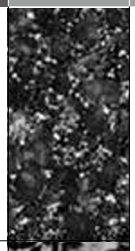
- High cutting depth versus general brazing type
- Economical cBN

High cutting depth and high feed available; excellent machining performance in spite of variable cutting depth
Universal machining available; stable and efficient machining versus general brazing inserts

cBN Feature

Feature

Applications by grade and textural characteristics

Textural characteristics	Texture	cBN content	Grade name	Workpiece, Applications	Features
Mostly cBN particles combine by themselves		High ▲	DB7000 DB7500	Cemented carbide alloy, chilled cast iron, Ni-hard cast iron, Iron metal sintered alloy, heat-resistant alloy, cast iron	• High cBN content and texture where cBN particles strongly combine by themselves • Suitable for cutting machining of high-hardness materials such as cast iron, heat-resistant alloy, Cemented carbide alloy, etc.
Mostly cBN particles combine by means of bonding material		▼ Low	DB1000, DB2000, DBN250, DBN350, DBN500 DBNX20 DBNX25 DNC100, DNC250, DNC300 DNC350, DNC400	Alloy steel, titanium steel, carbon tool steel, bearing steel, dice steel, ductile cast iron	• cBN particles strongly combine by special ceramic bonding material • Features excellent wear resistance and tenacity in cutting heat-treated steel due to its high cBN retention capacity

Grade map

Workpiece	Type	High-speed continuous	Continuous	Low/medium interrupted	High interrupted
	Usage classification	H01	H10	H20	H30
H Heat-treated steel	Coated cBN	DNC100	DNC250	DNC300 NEW	DNC350
	Non-coated cBN	DB1000	DB2000	DBNX20	DBNX25
	Usage classification	1	10	20	30
Sintering Parts	Non-coated cBN	DB7500	DB7000		
	Usage classification	K01	K10	K20	K30
K Cast iron	Non-coated cBN	DBN500	DB7000	DBNS800	
	Usage classification	S01	S10	S20	S30
S Difficult-to-cut materials	Non-coated cBN	DB7000	DBNS800		

cBN Heat treated steel

Features and cutting conditions of cBN grade

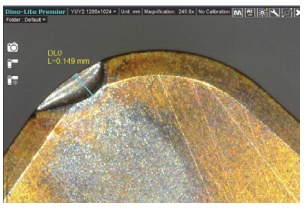
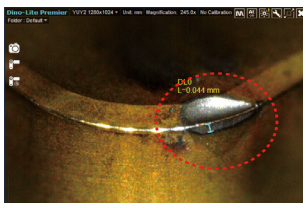
Grade			Insert color	Applications	Cutting conditions		
Classification	Coated or non-coated	Name			Cutting speed Vc(m/min) 0 50 100 150 200 250 300	Feed f(mm/rev)	Cutting depth ap(mm)
H Heat-treated steel	Coated	DNC100	Dark brown	For high-speed, continuous cutting	180 – 300	0.03 -0.30	0.03 -0.30
		DNC250	Gold color	For continuous, low interrupted cutting	120 – 220	0.05 -0.30	0.05 -0.30
		NEW DNC300	Dark brown	For low/medium interrupted cutting	90 – 250	0.05 -0.20	0.05 -0.25
		DNC350	Dark brown	For medium/high interrupted cutting	90 – 150	0.05 -0.30	0.05 -0.50
	Non-coated	DBNX20		For high efficiency cutting	120 – 150	0.03 -0.30	0.03 -0.50
		DBNX25		For high-speed interrupted cutting	150 – 200	0.03 -0.30	0.03 -0.50
		DBN250		For low/medium interrupted cutting	80 – 120	0.03 -0.20	0.03 -0.30
		DBN350		For high interrupted cutting	80 – 110	0.03 -0.20	0.03 -0.30
		DB1000		For high-speed, continuous cutting	130 – 250	0.03 -0.15	0.03 -0.20
		DB2000		For low/medium interrupted cutting	80 – 200	0.03 -0.20	0.03 -0.30

Comparison of coated and non-coated cBNs

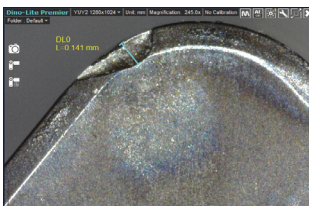
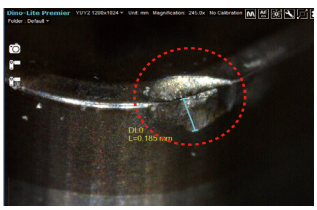
Machining information

Vc(m/min)	f(mm/rev)	ap(mm)	No. of machining ops.	Cutting distance	Workpiece	Heat treated	Hardness	Size
200	0.1	0.1	20 times	6km	SCM415 round rod	Carburizing heat treatment	58~62	Ø105*150

Wear loss (coating superior)

Coated cBN

Non-coated CBN

Surface roughness (non-coating superior)

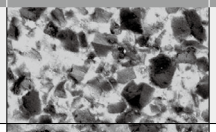
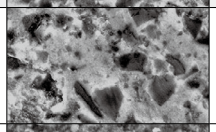
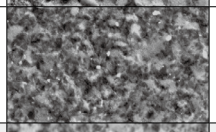
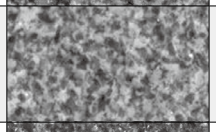
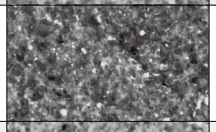
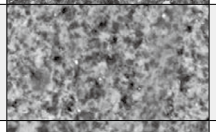
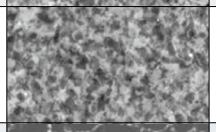
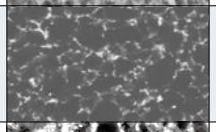
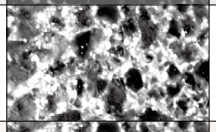
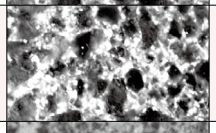
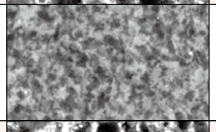
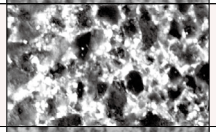
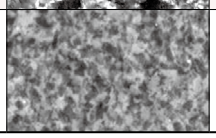
Surface roughness			
Grade	8 times	12 times	20 times
Non-coated CBN	Ra 0.431	Ra 0.477	Ra 0.492
Coated cBN	Ra 0.579	Ra 0.631	Ra 0.792

※The details may vary according to machining environments.

cBN Feature

Non-coating information

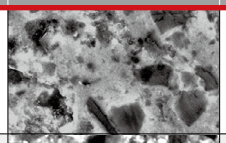
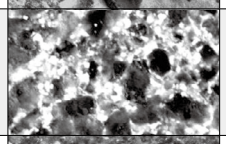
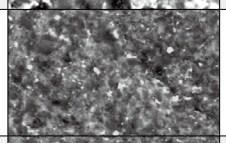
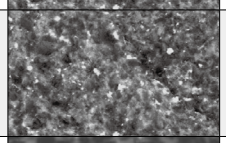
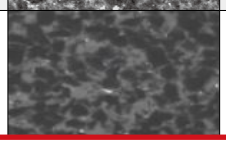
Characteristics

Classification	Grade	Texture	Binder	CBN content (%)	Grain size (㎛)	Hardness HV (Gpa)
H Heat-treated steel	DB1000		TiCN	40 - 45	1	27 - 31
	DB2000		TiN	50 - 55	2	31 - 34
	DBNX20		TiN	55 - 60	3	31 - 33
	DBNX25		TiN	65 - 70	4	29 - 31
	DBN250		TiN	50 - 55	2	31 - 34
	DBN350		TiN	60 - 65	1	33 - 35
Sintering Parts	DB7000		CO compound	90 - 95	2	41 - 44
	DB7500		CO compound	90 - 95	1	41 - 44
K Cast iron	DBN500		TiC	65 - 70	6	32 - 34
	DBNS800		Al compound	85 - 90	8	39 - 42
	DB7000		CO compound	90 - 95	2	41 - 44
S Difficult-to-cut materials	DBNS800		Al compound	85 - 90	8	39 - 42
	DB7000		CO compound	90 - 95	2	41 - 44

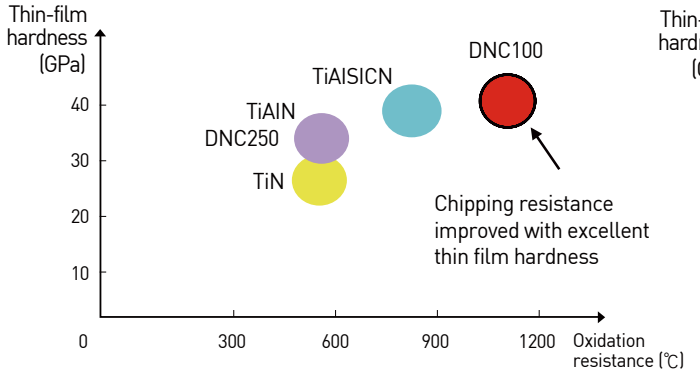
cBN Feature

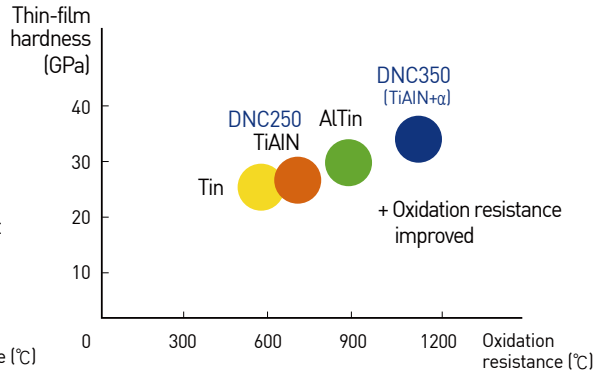
Coating information

Characteristics

Classification	Grade	Texture	Binder	CBN content (%)	Grain size (㎛)	Hardness HV (Gpa)
H Heat-treated steel Coating	DNC100		TiN	50 - 55	2	31 - 34
	DNC250		TiC	65 - 70	6	32 - 34
	NEW DNC300		TiN	65 - 70	4	29 - 31
	DNC350		TiN	60 - 65	1	33 - 35
	DNC400		TiN	65	3	-

Coated thin-film characteristics



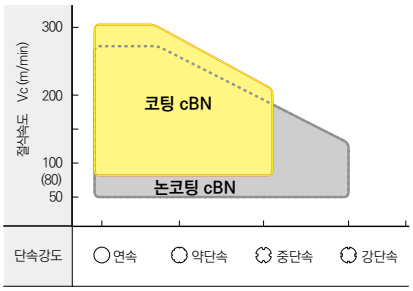


cBN Heat treated steel

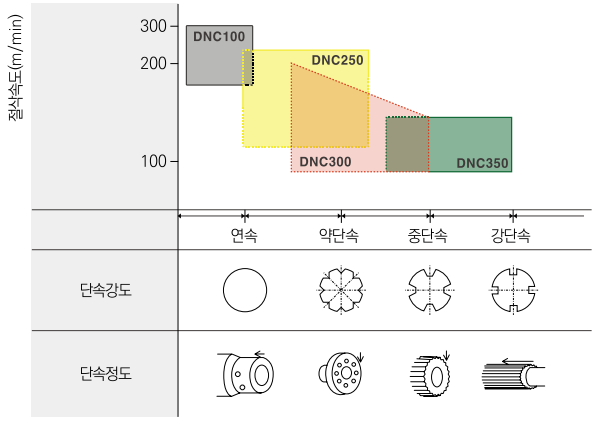
Applicable area

- **Coated cBN** : Suitable for all heat-treated steel machining as it is excellent in high-speed high-efficiency machining
- **Non-coated cBN** : Suitable for machining of high-hardness heat-treated steel or parts to which cutting speed is limited

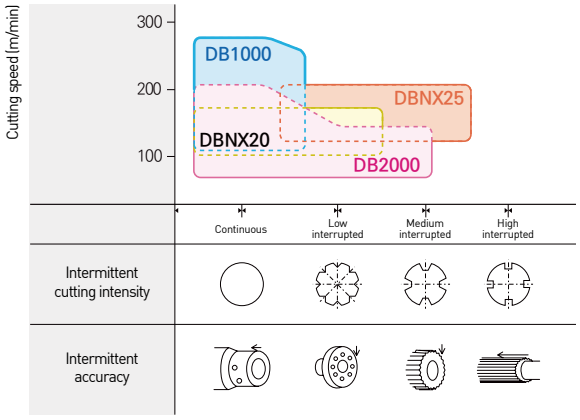
Series	Usable area
Coated cBN	· Ideal for heat-treated steel machining · Machining requiring high speed and high precision · Machining requiring high efficiency such as carburized layer removal
Uncoated cBN	· Small parts not requiring high cutting speed · Machining materials including much hard particles such as mold parts · Applicable even in case of an unstable machine setup



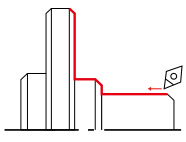
Coated cBN



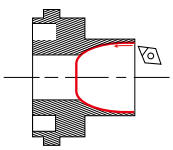
Non-coated CBN



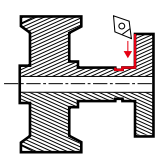
Recommended Machining Works



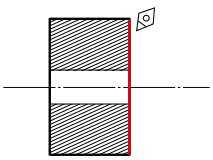
외경가공



내경(곡면) 가공



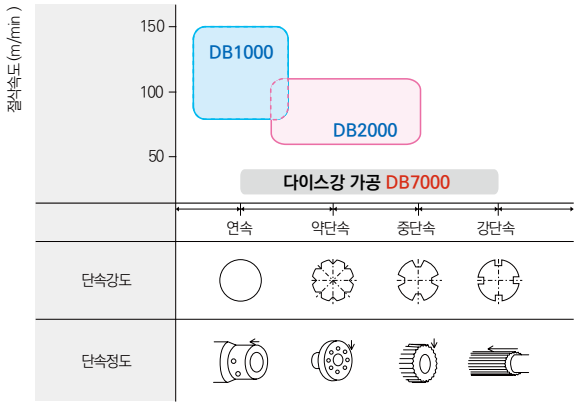
폭 결정, 홈 가공



단면 가공

Dice steel

Non-coated CBN



cBN Cast iron

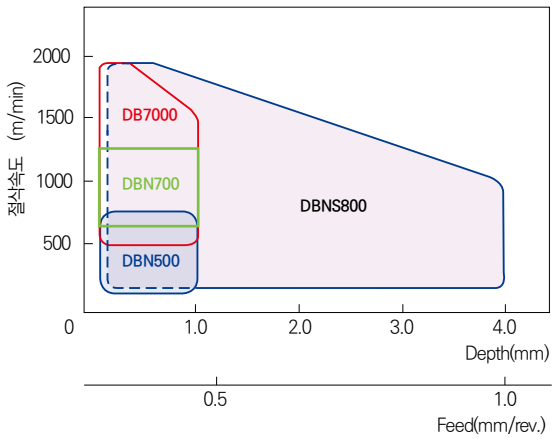
K Cast iron

Features and cutting conditions of cBN grade

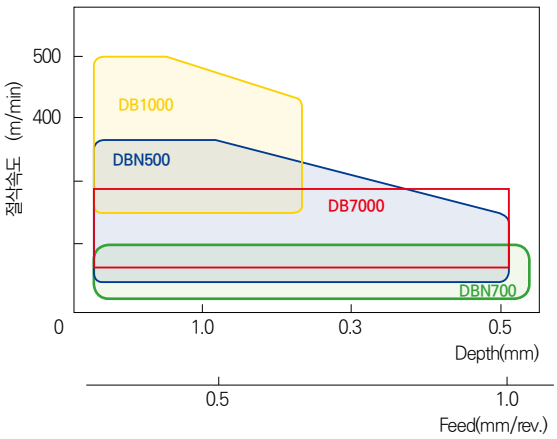
Applications	Workpiece	Grade	Cutting conditions		
			Cutting speed Vc(m/min) (100 500 1000 1500 2000)	Feed f(mm/rev)	Cutting depth ap(mm)
Turning	Gray cast iron	DBNS800	200 – 2000	0.1 ~ 1.0	≤4.0
		DBN500	200 – 700	0.1 ~ 0.5	≤1.0
		DB7000	500 – 2000	0.1 ~ 0.5	≤1.0
	Alloy cast iron	DBNS800	200 – 1000	0.1 ~ 0.8	≤2.0
	Ductile cast iron	DBN500	100 – 350	0.1 ~ 0.4	≤0.5
		DB1000	250 – 500	0.1 ~ 0.2	≤0.2
		DB7000	80 – 200	0.1 ~ 0.4	≤0.5
Milling	Gray cast iron	DBN700	800 – 2000	0.1 ~ 0.5	≤0.5
		DBNS800	800 – 2000	0.1 ~ 1.0	≤4.0

Applicable area

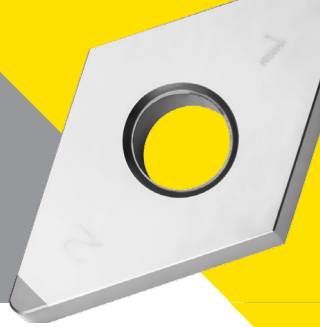
Gray cast iron



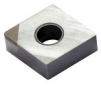
Ductile cast iron



cBN Cast iron



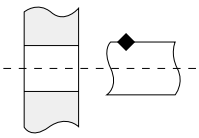
cBN grade features

Grade			Insert color	Applications	Features
Classification	Coated or uncoated	Name			
K Cast iron	Uncoated	DBN700		High-speed cutting of FC / cutting of milling of FC, cutting of iron metal heat-treated parts cutting of high-hardness roll / cutting of heat-resistant ally	Grades whose material strength and thermal conductivity are improved by greatly increasing cBN content and optimizing sintered tissues
		DBN500		FC, FCD cutting, high-hardness VSR cutting, high-hardness roll grinding cutting	For cast iron cutting, cBN sintered body formation is optimized and wear resistance and damage resistance are excellent
		DB7000		Foundry machining	For cast-iron difficult-to-cut materials machining, wear resistance and damage resistance are excellent
		DBNS800		Large cutting depth machining, high-precision grinding machining	The solid structure capable to be used cutting knife of entire insert, which responds brazing type machining and high-speed grinding unlike conventional brazing type

Machining example

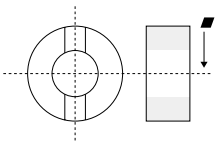
DBN500 TEST RESULT

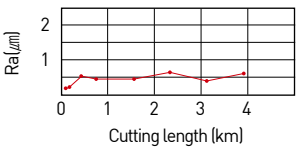
Grade	DBN500	Third-party cBN
INSERTS	SPGN090308	
Parts name (workpiece)	Crank bore (FC250 = FCD450 Inner boring)	
Vc(m/min)	150	
f(mm/rev)	0.15	
ap(mm)	0.5	
Dry/wet cutting	Wet cutting	



DBN500 TEST RESULT

Grade	DBN500	Third-party cBN
INSERTS	CNMA120412	
Parts name (workpiece)	Compressor Comp (FC250 facing, Interrupted)	
Vc(m/min)	400	
f(mm/rev)	0.07	
ap(mm)	0.15	
Dry/wet cutting	Wet cutting	

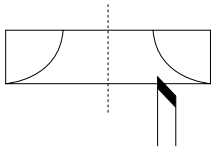




DBN500 : under 0.8㎛, Ceramics : over 1.5㎛

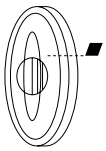
DBN700 TEST RESULT

Grade	DBN700	Third-party cBN
INSERTS	Special Bite	
Parts name (workpiece)	VSR intake (Hv250-330 Plunge Cutting)	
Vc(m/min)	95	
f(mm/rev)	0.08	
ap(mm)	0.2	
Dry/wet cutting	Dry cutting	



DBN700 TEST RESULT

Grade	DBN700	Third-party cBN
INSERTS	SPGN090308 / TNGA150408	
Parts name (workpiece)	Fly wheel (FC300 facing)	
Vc(m/min)	600	
f(mm/rev)	0.15	
ap(mm)	0.2	
Dry/wet cutting	Wet cutting	



※The details may vary according to machining environments.

cBN Sintered parts

Sintering Parts

Features and cutting conditions of cBN grade

* First recommended

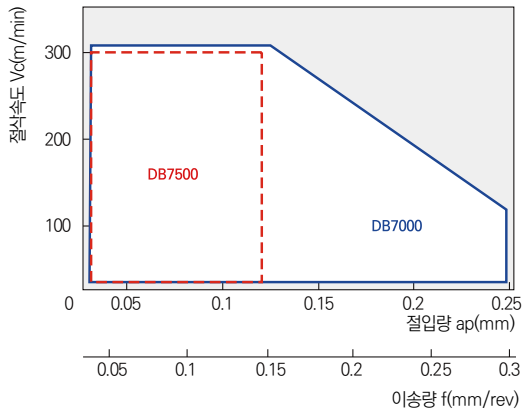
Grade			Insert color	Applications	Features
Classification	Coated or uncoated	Name			
Sintering Parts	Uncoated	DB7000		High density heat treated parts	Features excellent wear resistance and damage resistance in sintered alloy machining to stably implement a long service life
		DB7500*		High density heat treated parts	Suitable for sintered alloy grinding machining by maintaining the best cutting taste

Workpiece	Grade	Cutting conditions		
		Cutting speed Vc(m/min) 100 150 200 250 300	Feed f(mm/rev)	Cutting depth ap(mm)
General sintered alloy	DB7000	80 ~ 300	0.1 ~ 0.3	≤0.25
	DB7500*	80 ~ 300	0.1 ~ 0.15	≤0.25

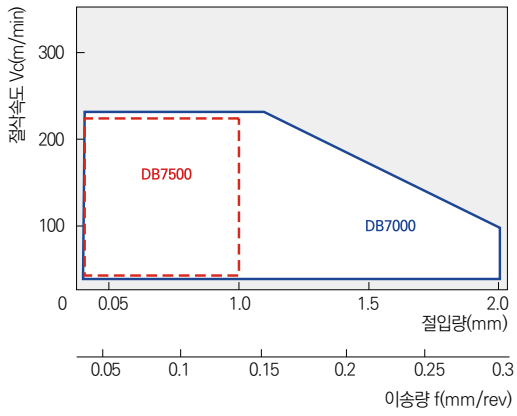
Workpiece	Grade	Cutting conditions		
		Cutting speed Vc(m/min) 100 150 200 250 300	Feed f(mm/rev)	Cutting depth ap(mm)
High-density heat-treated sintered alloy	DB7000	80 ~ 200	0.1 ~ 0.3	≤0.2
	DB7500*	80 ~ 200	0.1 ~ 0.15	≤0.2

Applicable area

General sintered alloy



High-density heat-treated sintered alloy



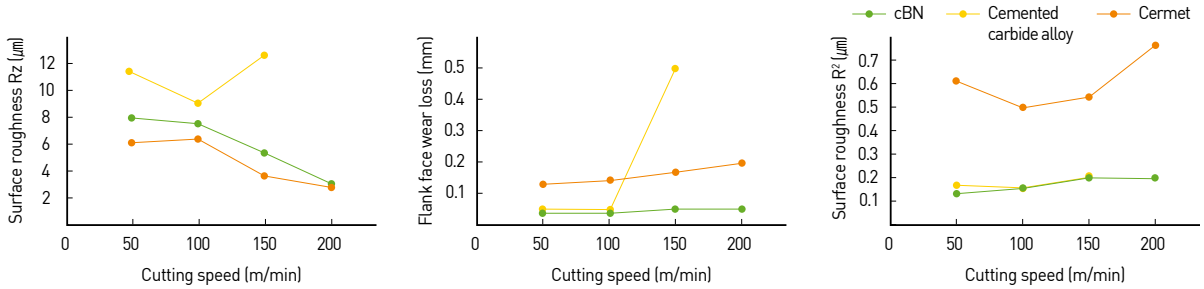
※The details may vary according to machining environments.

cBN Sintered parts

Sintering Parts

cBN cutting performance

Comparison of cutting performance by tool materials



· **Workpiece** : Equivalent to SMF4040
· **Details of machining**: High interrupted cross-sectional machining with a groove, hole Ø80-Ø100 (after 40 pass machining)
· **Tool model no.** : TNGA160404 / DB7000
· **Cutting conditions** : f=0.1mm/rev.ap=0.1mm, wet cutting

General sintered alloy up to Vc=100m/min can be machined even in the case of cemented carbide alloy or cermet. But after about Vc=120m/min it is rapidly worn so surface roughness is weakened and burr is expanded. On the contrary, cBN ensures reliable machining as it is excellent in surface roughness in high-speed areas, wear resistance, and burr inhibition.

Valve seat ring (VSR)

VSR is divided into VSR for Intake (IN) and VSR for Exhaust (EX). Generally, VSR for EX is of high hardness.

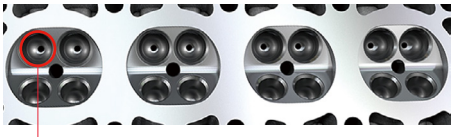
Recommended grade

Cutting speed	Gasoline engine VSR material	Diesel engine VSR material
Flange cutting	DB7000 DBN350	DB7000 DBN350
Traverse cutting	DB7000 DBN500	DB7000 DBN500
Workpiece hardness (HV)	Low ◀ HV300 ▶ High	Low ◀ HV300 ▶ High

Recommendation conditions

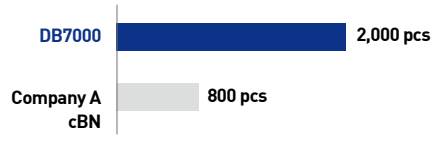
Cutting speed Vc(m/min)	Feed f(mm/rev)	Cutting depth ap(mm)
50~100	0.03~0.2	0.05~0.5

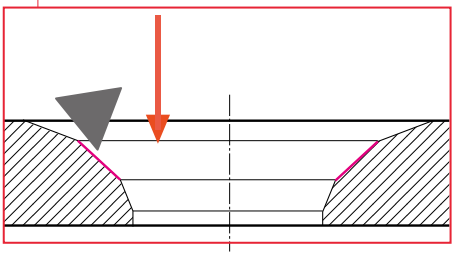
Cutting example



※Cylinder head shape

The tool service life was increased more than two fold versus conventional one when machining with DB7000 whose damage resistance is excellent.





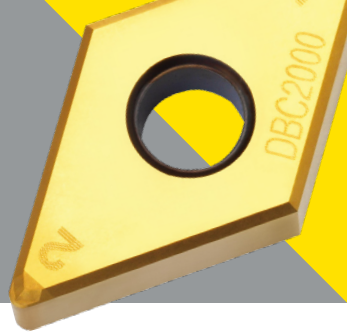
Recommendation conditions

· **Workpiece** : Sintered alloy (150-250HV)
· **Details of machining** : VSR(IN) 45-face grinding machining
· **Tool model no.** : TBGN060104 (DB7000)
· **Cutting conditions** : Vc=100m/min, f=0.08mm/rev, wet cutting

※The details may vary according to machining environments.

RA/GA Chip Breaker

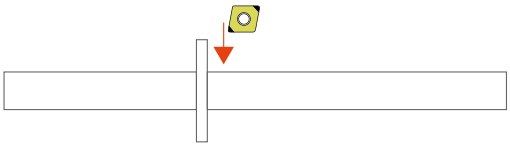
cBN Chip Breaker

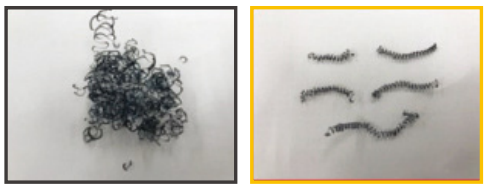


Features

- Prevents drag of chip into the workpiece during machining
- Ideal for unmanned automatic operations of the cutting process
- The RA chip breaker is for rough boring process.
- GA chip breaker is for finishing boring process.

Example of use



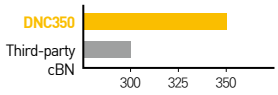


Non-breaker

GA chip breaker

Applicable area

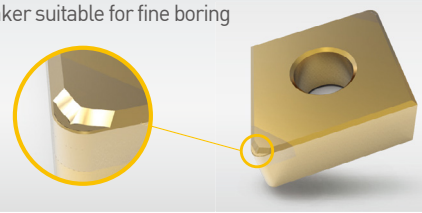
Grade	DNC350(GA)	Third-party cBN
INSERTS	2NU-CNGM120412-GA	
Parts name (workpiece)	Input Shaft (SCM920 HVSI)	
Vc(m/min)	145	
f(mm/rev)	0.1	
ap(mm)	0.4 ~ 0.5	
Dry/wet cutting	Wet cutting (excellent chip breaking versus rival products)	



Chip Breaker

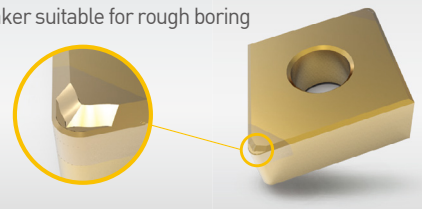
GA type

Chip breaker suitable for fine boring

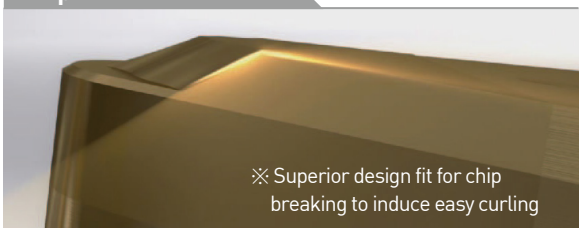


RA type

Chip breaker suitable for rough boring

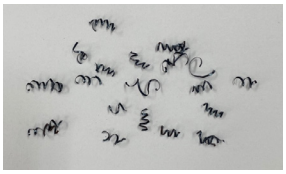


Chip Breaker Features



Chip breaker comparison

GA Chip Breaker

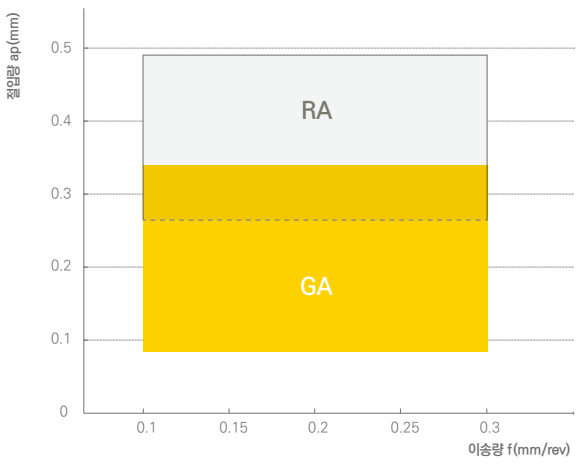


V=150m/min
f=0.15 mm/rev
ap=0.15mm

RA Chip Breaker

V=150m/min
f=0.15 mm/rev
ap=0.3mm

Applicable area



※The details may vary according to machining environments.

PCD Technical data

PCD Features

DINE PCD products provide very high accuracy and excellent wear resistance as they are manufactured by the ultrahigh temperature and ultrahigh pressure manufacturing process to combine diamond polycrystallines in high density.
Also as the PCD products are based on the diamond crystal particle size control technology by DINE Inc., various workpieces can be machined widely. DINE PCD products provide excellent workpiece surface roughness, high machining accuracy and long tool service life.

- Excellent in machining aluminium alloys and copper alloys
- Excellent in machining ceramic, high Si-aluminium alloy, stone, etc.
- Excellent in machining rubber, carbon, graphite, wood, etc.

PCD Shape

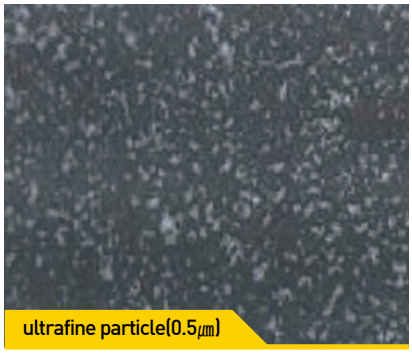
TNMX

CCMT

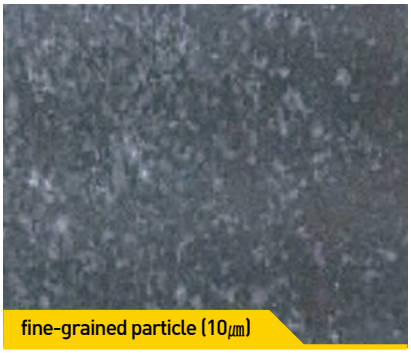
SPGN

PCD Tool technology guide

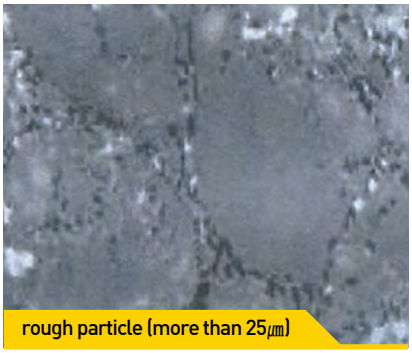
1. PCD = polycrystalline diamond = particle sintered diamond
2. Composition : [diamond crystal grain + diamond additives (metal, ceramic)]
   sintering by high temperature and pressure (1200℃, 50k atm)
3. Particle size : ultrafine particle (0.5㎛) 〈 fine-grained particle (10㎛) 〈 rough particle (more than 25㎛)



ultrafine particle(0.5㎛)



fine-grained particle (10㎛)



rough particle (more than 25㎛)

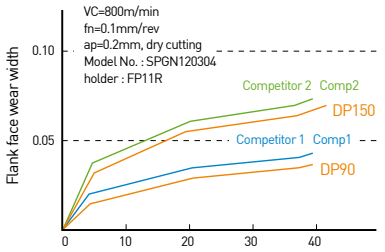
4. Application : nonferrous metals, glass fiber, woodwork, high-hardness plastic
5. Specification
   1) rough particle =〉 high density and thermal conductivity - excellent wear resistance but weak surface roughness.
   2) Cutting edge oxidation occurs in case of machining high-hardness materials at low oxidation temperature

PCD Technical data

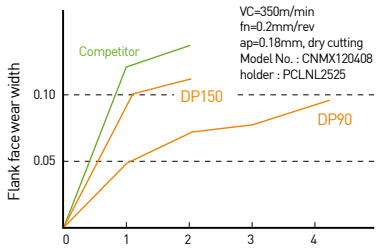
Recommended Cutting Conditions

Workpiece	Cutting speed	Feed	Single cutting depth	Recommended grade	
				1st	2nd
Aluminium alloy (4%~8%Si)	1,000~3,000	0.1~0.6	~3	DP150	DP200
Aluminium alloy (9%~14%Si)	600~2,500	0.1~0.5			
Aluminium alloy (15%~18%Si)	300~700	0.1~0.4			
Copper alloy	~1,000	0.05~0.2			
Reinforced plastic		0.1~0.3	~2		
Wood	~4,000	0.1~0.4	-		
Cemented carbide	10~30	~0.2	~0.5	DP90	DP150

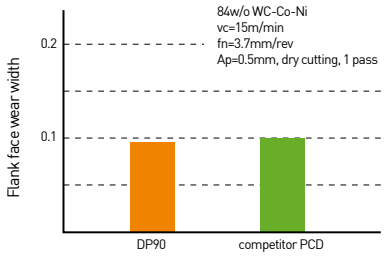
Continuous cutting test(workpiece:Al-25%Si)



Interrupted cutting test(workpiece:Al-20%Si)



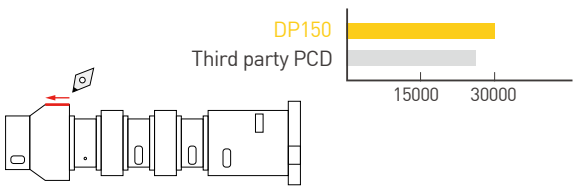
Continuous cutting test(workpiece:Al-25%Si)



Machining example

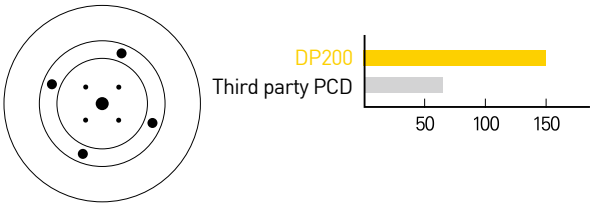
DP150 TEST RESULT

Grade	DP150	Company A PCD
INSERTS	DCMT11T304-UC	
Parts name (workpiece)	Compressor piston (AL A4000)	
Vc(m/min)	400-450	
f(mm/rev)	0.12	
ap(mm)	1.0 ~ 1.5	
Dry/wet cutting	Wet cutting	



DP200 TEST RESULT

Grade	DP200	Company A PCD
INSERTS	NF-SEN09T3ADTR	
Parts name (workpiece)	Ring spec. outer diameter (AL6061)	
Vc(m/min)	380	
f(mm/rev)	0.1	
ap(mm)	0.15	
Dry/wet cutting	Dry/wet cutting	



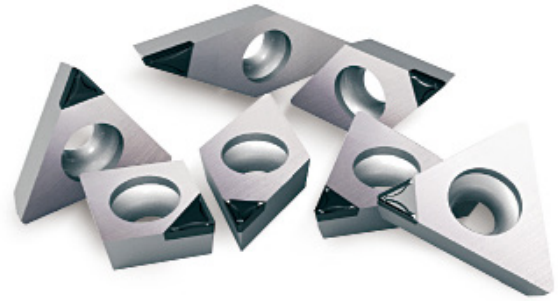
※The details may vary according to machining environments.

PCD Chip Breaker(UC)

New PCD insert with Chip Breaker

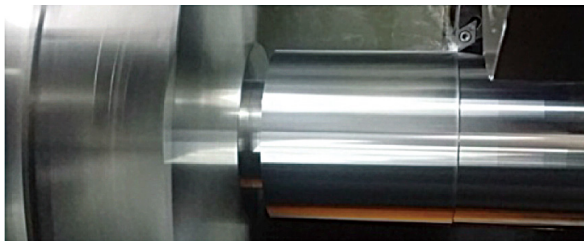
Features

- Productivity improved by resolving chip troubles
- Stable capacity to break chips in the large cutting area
- Excellent in machining aluminium and copper alloys
- Provides very high hardness and excellent wear resistance due to high-density combination of diamond polycrystallines



Performance Comparison Test

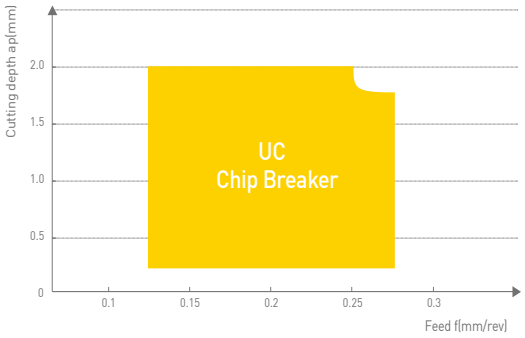
- Tool model no. : DCMT11T304-UC
- Workpiece: AL6061 (Ø 100*160L outer dia. boring)
- Cutting conditions : Vc=500m/min, f=0.15mm/rev, ap=0.2mm, dry cutting



General type PCD

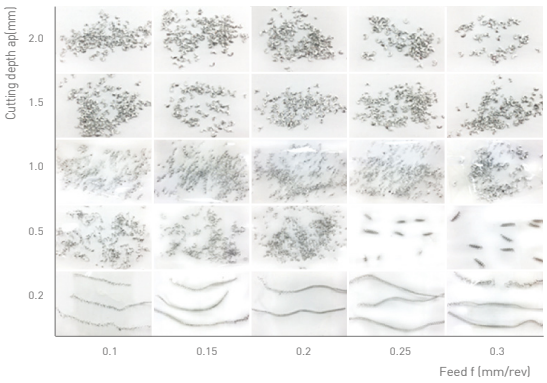
UC Chip breaker

Applicable area

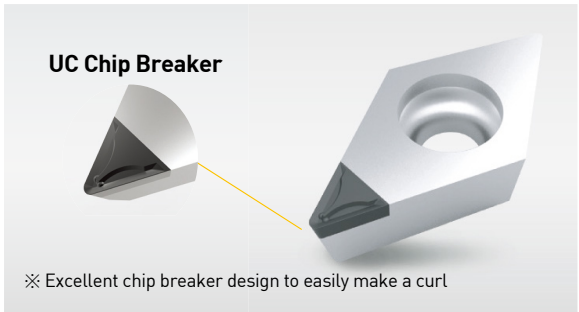


Shape of chip

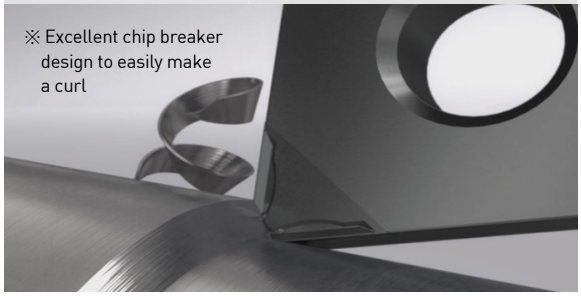
- Tool model no. : DCMT11T304-UC
- Workpiece: AL6061 (Ø 100*160L outer dia. boring)
- Cutting conditions : Vc=500m/min dry cutting



Chip Breaker

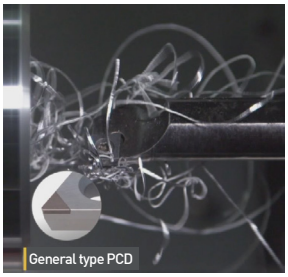


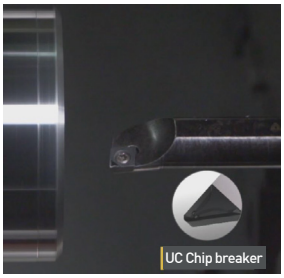
※ Excellent chip breaker design to easily make a curl



※ Excellent chip breaker design to easily make a curl

Comparison of chip rear discharge



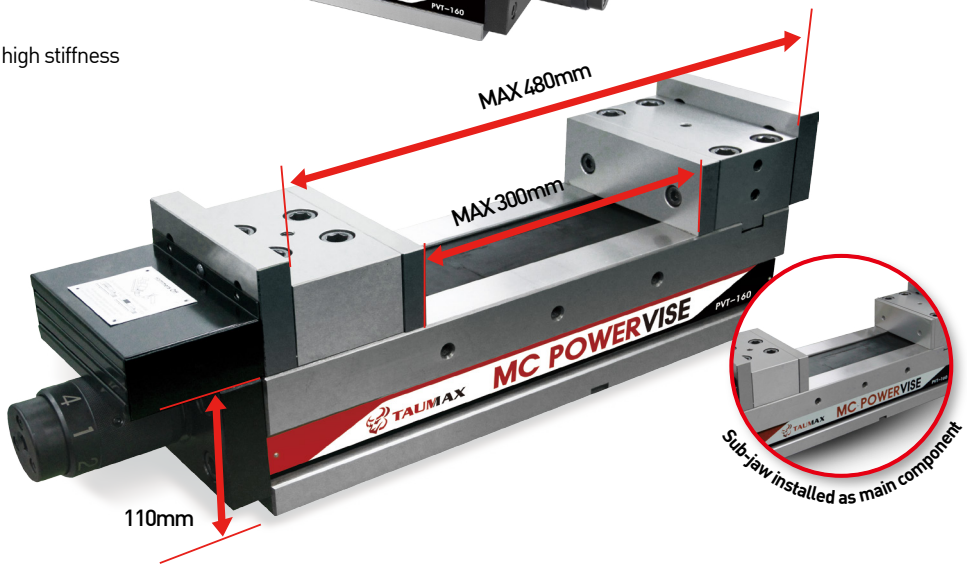


Power Vise (PVT)

MC POWER VISE - PVT (standard type)

Features

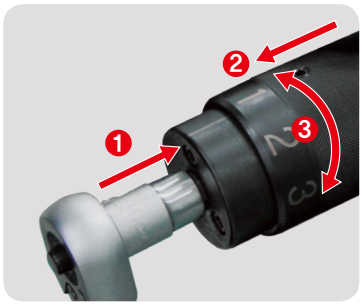
- Apparatus type power increase device adopted
- Designed to minimize workpiece floating
- Height tolerance: 0.01mm, Can be used in parallel
- Built-in IN (18T) sub-jaw
- Durability enhanced by using high stiffness materials



PVT

Max. opening width
(Based on 6 inches)

How to use



① Fix the grip after tightening by the main handle
② Pull the clamping force control grip toward the handle
③ Rotate the clamping force control grip from side to side to set the clamping force.

Clamping force

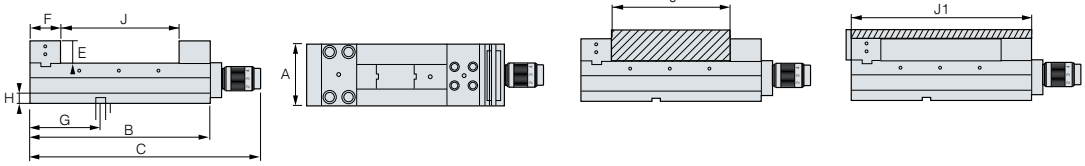
(Unit: kgf)

Grasp step \ Spec.	PVT-100	PVT-130	PVT-160	PVT-200
Step 1	1,000	1,500	2,000	2,500
Step 2	2,000	2,500	3,000	3,500
Step 3	3,000	3,500	4,000	4,500
Step 4	3,500	4,500	5,000	5,500

Main components

Handle	Ratchet handle	Internal sub-jaw	Accessory
			

※ IN/OUT Sub-jaw is the same, available as PVT Entry Type.



Model No.	A	B	C	D	E	F	G	H	I	J	J1	Clamping force (Kgf)	Kg
PVT-100	100	310	442	85	50	75	110	25	18	150	300	3,500	29
PVT-130	130	410	542	100	55	80	135	25	18	240	400	4,500	46
PVT-160	160	490	622	110	60	85	200	25	18	300	480	5,000	68
PVT-200	200	530	662	110	60	85	220	25	18	350	520	5,000	91

Power Vise (PVTM)

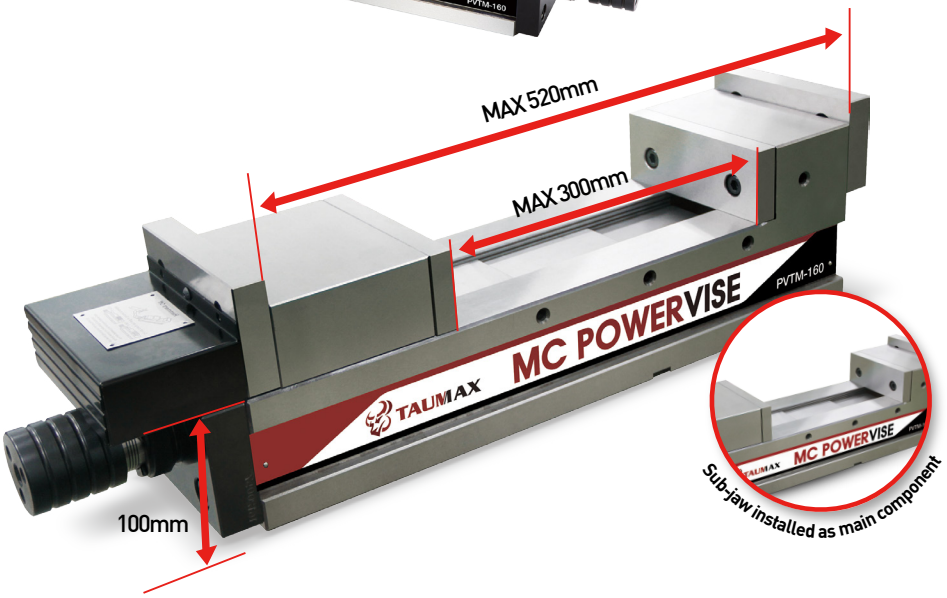
MC POWER VISE - PVTM (entry type)

Features

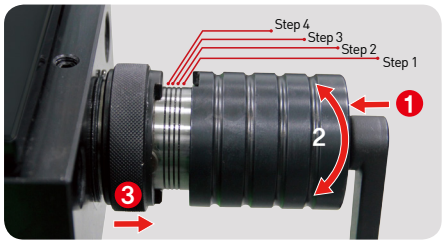
- Easy-to-use entry type power vise
- Apparatus type power increase device adopted
- Height tolerance: 0.01mm, Can be used in parallel
- Built-in IN (18T) sub-jaw

PVTM

Max. opening width
(Based on 6 inches)



How to use



① Push it to the workpiece using the ratchet handle, a main component
② Apply instantaneous torque (rotation) to increase grasping power
Pull out the workpiece by turning the ratchet handle in the opposite direction after machining
③ Be sure to use the clutch to clamp any hard workpiece (mild steel, aluminium, copper, acryl, etc.) . Otherwise, the material of the workpiece may be strained.

Clamping force

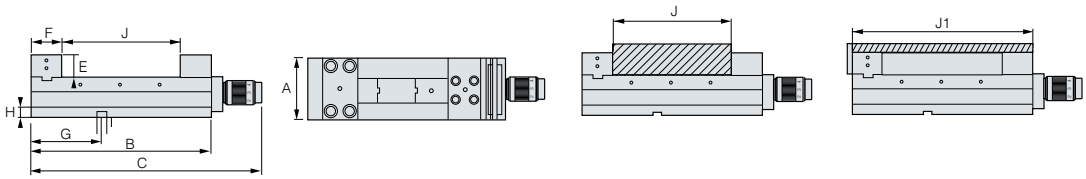
(Unit: kgf)

Spec. / Grasp step	PVTM-100	PVTM-130	PVTM-160	PVTM-200
Step 1	1,500	2,000	2,000	2,000
Step 2	2,500	3,000	3,000	3,000
Step 3	3,000	4,000	4,000	4,000
Step 4	3,500	4,500	5,000	5,000

Main components

Handle	Ratchet handle	Internal sub-jaw	Accessory
			

※ IN/OUT Sub-jaw is the same, available as PVT Standard Type.



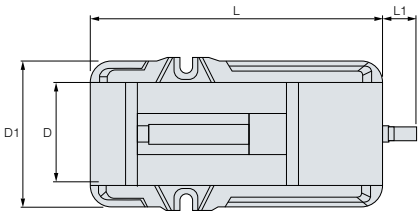
Model No.	A	B	C	D	E	F	G	H	I	J	J1	Clamping force (Kgf)	Kg
PVTM-100	100	310	442	85	50	75	110	25	18	150	300	3,500	29
PVTM-130	130	410	542	100	55	80	135	25	18	240	400	4,500	46
PVTM-160	160	490	622	110	60	85	200	25	18	300	480	5,000	68
PVTM-200	200	530	662	110	60	85	220	25	18	350	520	5,000	91

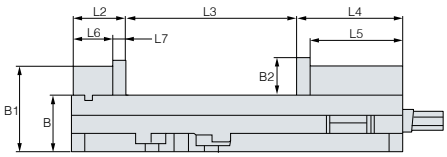
Machine Vise (MVT-154)

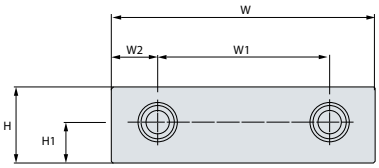
MC MACHINE VISE-MVT (standard type)

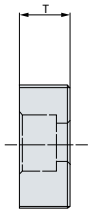
Features

- Provides a wide machining range (Max. opening width: 225mm)
- Durability enhanced by using high stiffness materials
- Parallel use available with basic dimensional design
- Easy to use, highly versatile machine vise









Model No.	L	L1	L2	L3	L4	L5	L6	L7	D	D1	B	B1	B2	Width	Max.CF	Kgs
MVT-154	438	56	70	225	141	123	52	18	154	230	73	111	44.5	154(6")	1,000kgF	31

ACCESSORIES

ACCESSORIES

Wrench

Sub jaws

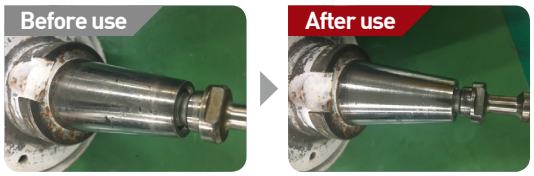
Model.No	W	W1	W2	H	H1	G	T
MVT-154 Sub jaws	152	98.4	26.7	44.5	23.8	M12x1.75P	18

TAPER CLEANER

TAPER CLEANING DEVICE

Features

- Accuracy enhanced through taper cleaning
- Tooling costs reduced by a longer cutting tool service life
- Protects the spindle of equipment
- Maintains accuracy of the contact surface for a long time
- Compact design and timer function



Item	Model No.	Diameter	Height	Kg	Power supply	Power consumption	Specifications
Lower basis	Taper cleaning drive unit	300mm	140mm	11	110-240 VAC	Max. 0.15kW	-
Upper cleaning part	Cleaning attachment ISO 30	230mm	160-190mm	10			BT/SK/CAT30
	Cleaning attachment ISO 40						BT/SK/CAT40
	Cleaning attachment ISO 50						BT/SK/CAT50
	Cleaning attachment HSK-63						HSK-63
	Cleaning attachment HSK-100						HSK-100

ACCESSORIES

ACCESSORIES

Item	Model No.	Specifications
Spare brush	Spare brush ISO 30	BT/SK/CAT30
	Spare brush ISO 40	BT/SK/CAT40
	Spare brush ISO 50	BT/SK/CAT50
	Spare brush HSK-63	HSK-63
	Spare brush HSK-100	HSK-100

SHRINK FIT DEVICE

MH-200

Features

- 30-time continuous heating available for a maximum of 1 hour (about 2 min. per tool required)
- Enables the common use of steel, SUS material holders
- All standard taper tools can be used simply by replacing the adapter flange
- Enables replacement of heating coils with a diameter of Ø25, Ø30, Ø40 or Ø55
- Prevents chuck overheating and enables manual tool cooling through settings

Easy usage setting

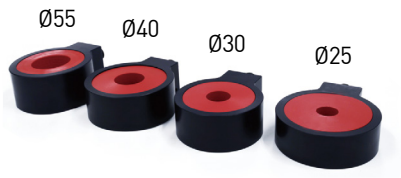
MH-200 Operating keypad		
	START/STOP	Heating start/stop switch
	SET-TIME	Heating time/cooling time setting
	ADD-TIME	Overtime manual progress
	COOL	Cooling device running
	UP/DOWN	10-second unit time setting

Model No.	WxLxH(mm)	Kg	Power supply	Max. power consumption	Frequency	Head operating range	Basic applicable tool diameter
MH-200	325x340x690	25	single-phase AC 100V~240V(50.6Hz)	3.6Kw (220V basis)	7KHz~45KHz	280mm	Ø4~Ø16

ACCESSORIES

ACCESSORIES

Heating coil



Item	Model No.	Inner size
Heating coil	HEATING COIL-25MM	25mm
	HEATING COIL-30MM	30mm
	HEATING COIL-40MM	40mm
	HEATING COIL-55MM	55mm
Adapter flange	ST10,12,16,20,25,32	-

※ Built-in Ø30 heating coil

Adapter flange

Built-in product

For separate-sale straight shank

MEMO

DINOX NC TOTAL TOOLING SYSTEM

DX-1122-DB-ENG-V1

DINE
DINE GROUP

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