AB

ADJUST BOLT (For HSK MQL1)

FIG 1

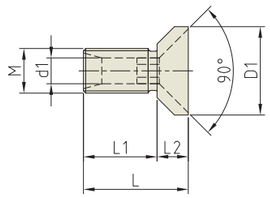
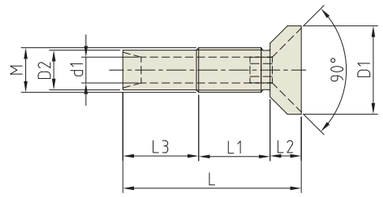


FIG 2



Unit : mm

DESCRIPTIONS	HOLDER I.D	EDP No.	L	L1	L2	L3	d1	D1	D2	M	FIG.
SHORT	6	P2775112	17.0	15.5	1.5	-	3.0	5.8	-	M5x0.8	1
	8	P2775113	18.0	15.5	2.5	-	3.5	7.8	-	M6x1.0	1
	10	P2775114	18.0	15.0	3.0	-	4.7	9.8	-	M8x1.0	1
	12	P2775115	18.0	15.0	3.0	-	5.8	11.8	-	M10x1.0	1
	14	P2775116	19.5	15.5	4.0	-	5.8	13.8	-	M10x1.0	1
	16	P2775117	22.0	17.0	5.0	-	5.8	15.8	-	M10x1.0	1
	18	P2775118	22.0	16.0	6.0	-	5.8	17.8	-	M10x1.0	1
	20	P2775119	23.5	16.5	7.0	-	5.8	19.8	-	M10x1.0	1
	25	P2775120	27.5	18.0	9.5	-	5.8	24.8	-	M10x1.0	1
	32	P2775121	30.5	17.5	13.0	-	5.8	31.8	-	M10x1.0	1
LONG	6	P2775122	34.0	32.5	1.5	15.0	3.0	5.8	4.1	M5x0.8	2
	8	P2775123	34.0	31.5	2.5	15.0	3.5	7.8	4.9	M6x1.0	2
	10	P2775124	35.0	32.0	3.0	15.0	4.7	9.8	6.9	M8x1.0	2
	12	P2775125	35.0	32.0	3.0	15.0	5.8	11.8	8.9	M10x1.0	2
	14	P2775126	35.5	31.5	4.0	15.0	5.8	13.8	8.9	M10x1.0	2
	16	P2775127	37.0	32.0	5.0	15.0	5.8	15.8	8.9	M10x1.0	2
	18	P2775128	37.5	31.5	6.0	15.0	5.8	17.8	8.9	M10x1.0	2
	20	P2775129	40.0	33.0	7.0	15.0	5.8	19.8	8.9	M10x1.0	2
	25	P2775130	44.0	34.5	9.5	15.0	5.8	24.8	8.9	M10x1.0	2
	32	P2775131	45.0	32.0	13.0	14.0	5.8	31.8	8.9	M10x1.0	2

YG-1 TOOLING SYSTEM

TECHNICAL INFORMATION

MODEL NUMBERING SYSTEM & SURFACE FINISH

HYDRAULIC CHUCK

SHRINK FIT HOLDER

ER COLLET CHUCK

POWER MILLING CHUCK

TAPPING ER CHUCK & TAPPING CHUCK

NC DRILL CHUCK

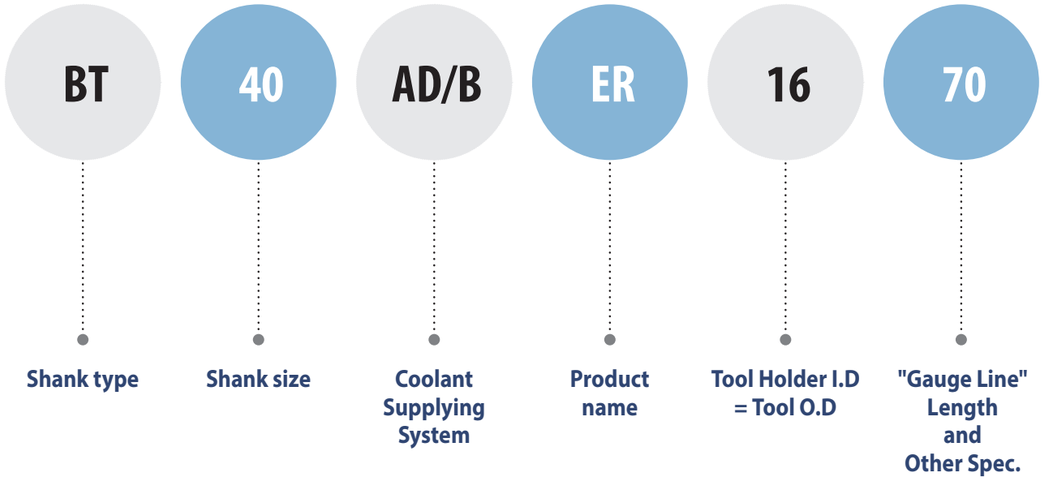
BALANCING

SHANK DATA

- SK (DIN 69871)
- BT (JIS B6339/MAS 403)
- HSK (DIN 69893/ISO 12164)
- ASME B5.50 (CAT)
- DIN 228 (MTA/MTB)

MODEL NUMBERING SYSTEM & SURFACE FINISH

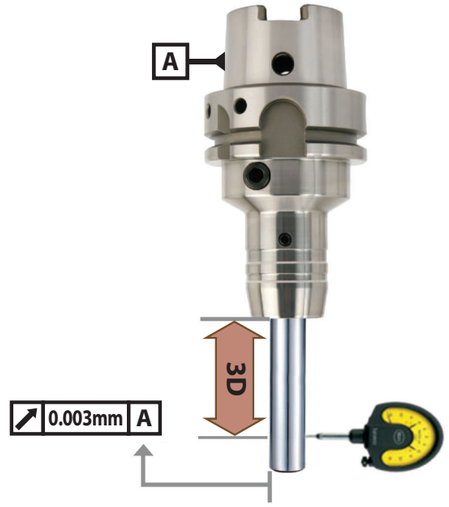
Model Numbering System



Surface Finish

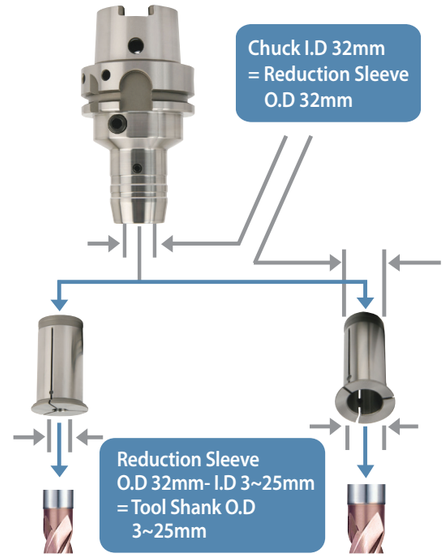
HYDRAULIC CHUCK

High precision T.I.R : ≤ 0.003mm (Without Reduction Sleeve)

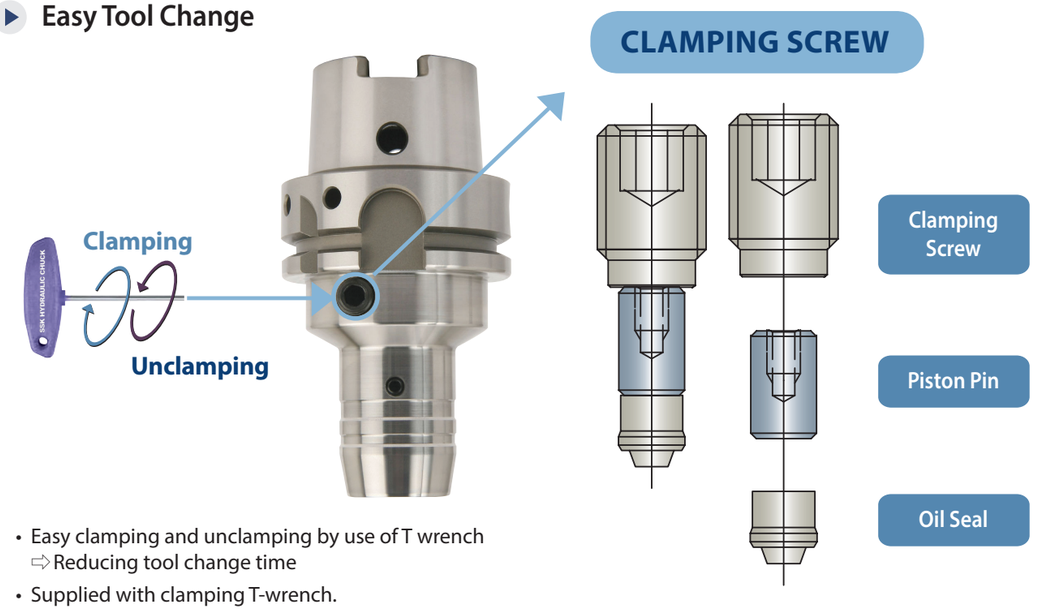


- Less than 0.003mm T.I.R
  ⇨ Suitable for High-Speed precision machining

Flexible use of cutting tools by using of reduction sleeves



Easy Tool Change



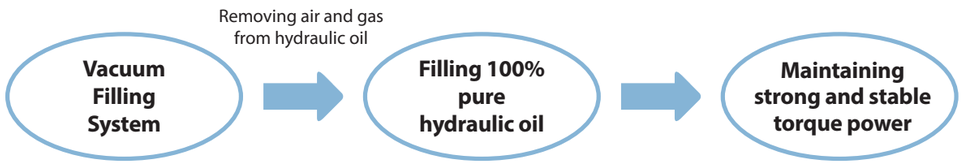
- Easy clamping and unclamping by use of T wrench
  ⇨ Reducing tool change time
- Supplied with clamping T-wrench.

HYDRAULIC CHUCK

Strong Torque Power

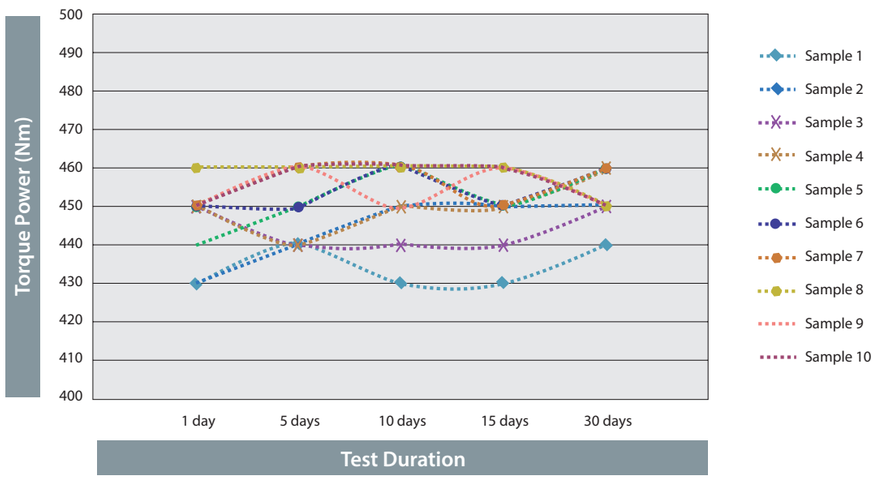
Hydraulic Chuck I.D (mm)	Tool Shank O.D (mm)	Applicable RPM	Minimum Clamping Depth (mm)		Min. Torque Power (Nm)	
			Standard	Power E Hydro	Standard	Power E Hydro
6	6	40,000	27		16	
8	8	40,000	27		23	
10	10	40,000	32		45	
12	12	40,000	37	41	90	110
14	14	40,000	37		110	
16	16	40,000	42		185	
18	18	40,000	42		240	
20	20	40,000	42	48	330	520
25	25	25,000	48		400	
32	32	25,000	55	57	650	900

- Tool Holder I.D Tolerance : H6
- Operating Temperature : 20~25℃
- Maximum pressure of coolant oil : 80bar



Test of Torque Power and Hydraulic Oil Leakage

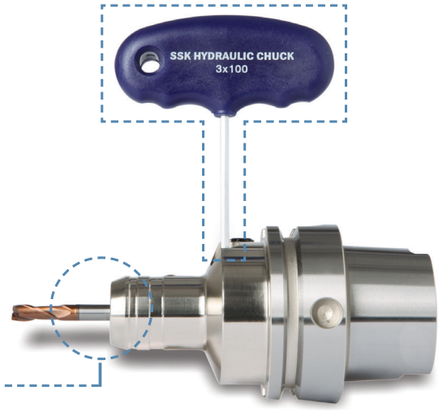
- Test Model : BT40 AD/B-HC 20-90
- No oil leakage for long period ⇨Maintaining stable torque power

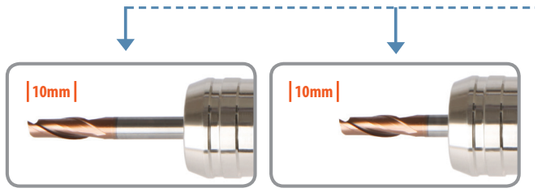


HYDRAULIC CHUCK

Radial Tool Length Pre-setting Type

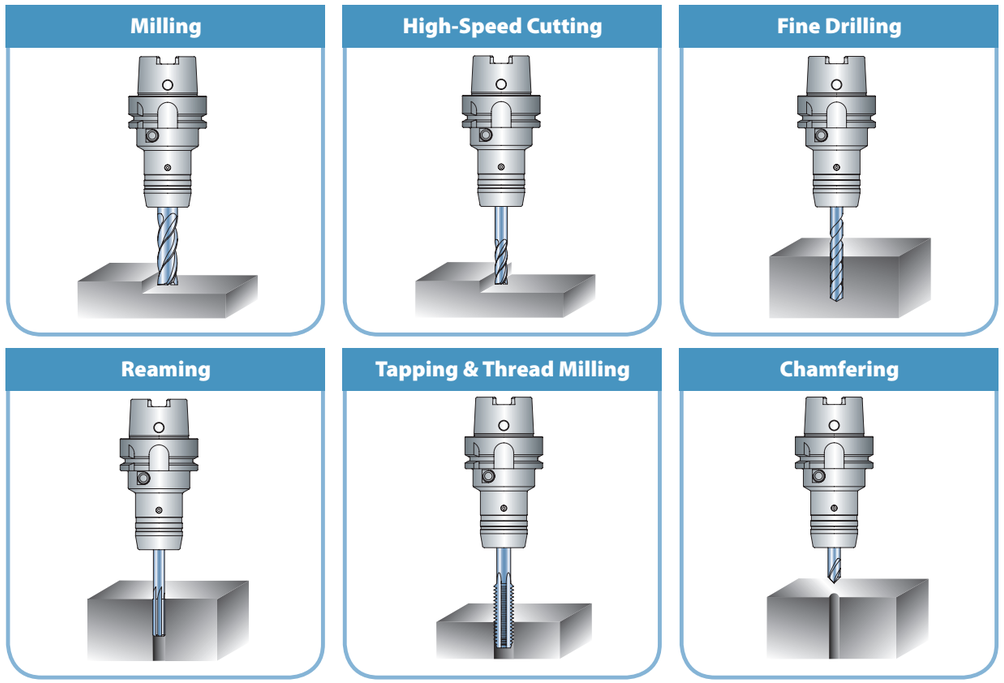
- Easy to adjust pre-setting length of cutting tool (Saving time to pre-set cutting tool to one fifth compared with conventional Hydraulic Chuck)
- Precise adjustment of cutting tool length
- Designed to separate tool length adjustment screw from clamping screw





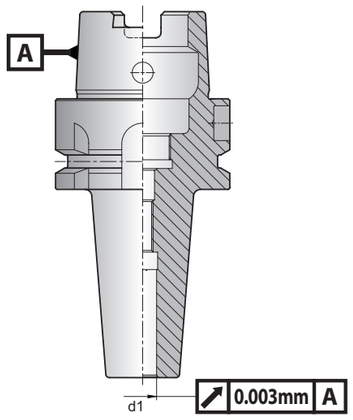
Adjustable range of cutting tool length : 0~10mm

Application



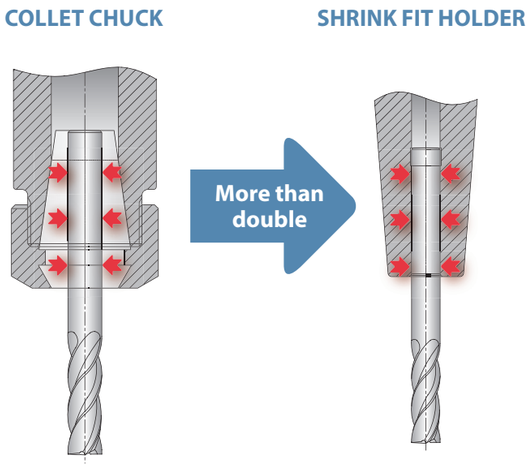
SHRINK FIT HOLDER

High Precision I.D
Run-Out : ≤ 0.003mm



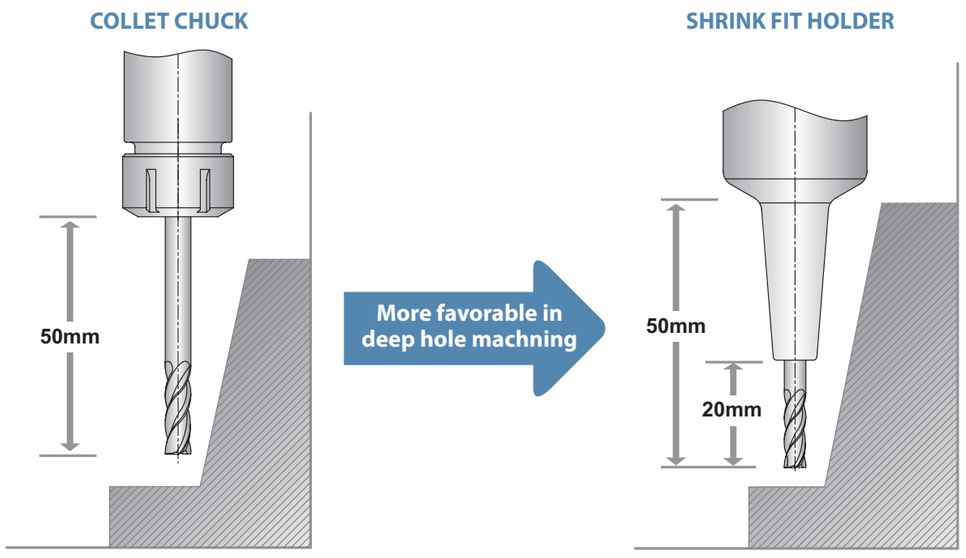
- Less than 0.003mm of Tool Holder accuracy at I.D

Strong and Consistent Torque Power



- Achieving strong torque power by integration of chuck and tool

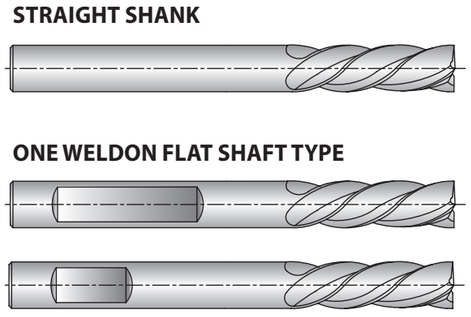
Deep hole Machining



- Suitable for High-Speed precision deep hole machining

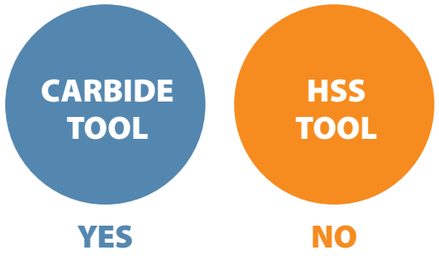
SHRINK FIT HOLDER

Shank Type of Cutting Tool

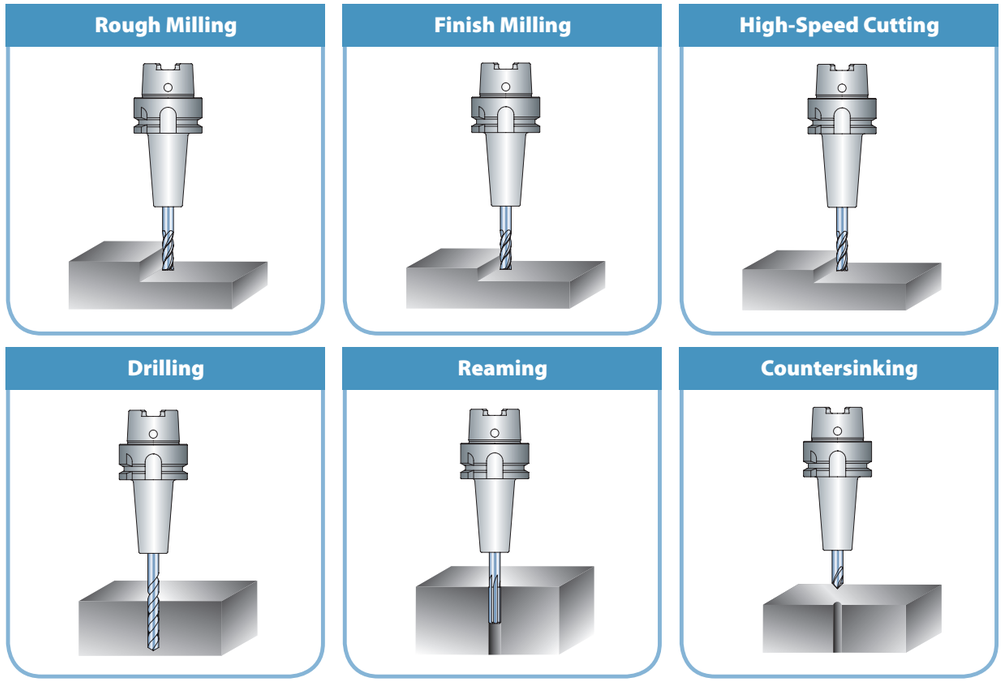


- One Weldon flat shaft type tool is usable, but there is a possibility that the I.D of Shrink Fit Holder may be deformed.

Material of Cutting Tool



Application



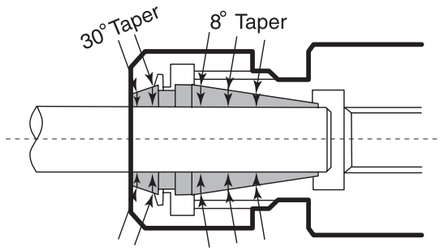
ER COLLET CHUCK

Feature

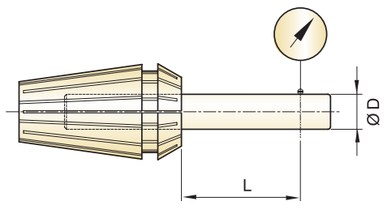
- Powerful chucking, high precision and easy operation
- Precise machining is stably maintained without chattering in High-Speed rotation.
- Due to nut designed with small bore, interference with work piece can be minimized and it enables speedy operation.
- Various nuts can be selected and used according to usage.
- Unlike single taper, double taper has long chucking part providing excellent torque power.

Strong Torque Power

- Longer clamping part of double taper collet provides stronger torque power.
- Stronger torque power can be achieved if ball bearing nut is used.



Standard Precision



Unit : mm

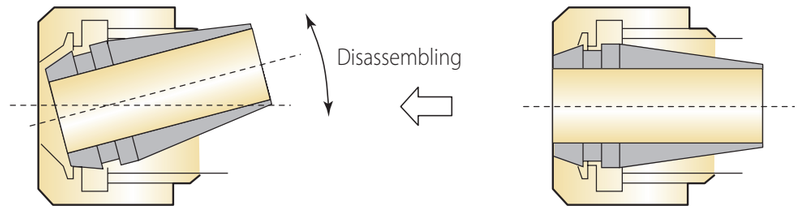
D	L	Max. T.I.R (STD.)
Ø1 ~ Ø1.6	6	0.015
Ø1.6 ~ Ø3	10	0.015
Ø3 ~ Ø6	16	0.015
Ø6 ~ Ø10	25	0.015
Ø10 ~ Ø18	40	0.020
Ø18 ~ Ø26	50	0.020
Ø26 ~ Ø34	60	0.020

- By using high precision collet, excellent T.I.R can be achievable
- With fine cutting of 16 sections, it has excellent contractile force, which makes higher precision can be achieved

ER COLLET CHUCK

Easy Assembling & Disassembling

- For assembling or disassembling of collet, first gently insert groove part of collet into eccentrical portion inside nut, and fasten it to same direction as screw or loosen it reversely.
- Notice : In case of Ø12.2mm tool, don't use Ø12~11mm collet.
  But use collet with Ø12.5~11.5mm. (In case of general cutting process, Ø13~12mm collet is usable)



Recommended Tightening Torque for the Collet Nut

Collet Chuck Size	Clamping Range (mm)	Max. Tightening Torque (Nm)
ER11	1.0 ~ 2.9	8
	3.0 ~ 7.0	24
ER16	1.0	8
	1.5 ~ 3.5	20
	4.0 ~ 4.5	40
	5.0 ~ 10.0	56
ER20	1.0	16
	1.5 ~ 6.5	32
	7.0 ~ 13.0	80

Collet Chuck Size	Clamping Range (mm)	Max. Tightening Torque (Nm)
ER25	1.0 ~ 3.5	24
	4.0 ~ 4.5	56
	5.0 ~ 7.5	80
	8.0 ~ 17.0	104
ER32	2.0 ~ 2.5	24
	3.0 ~ 22.0	136
ER40	3.0 ~ 26.0	176
ER50	6.0 ~ 36.0	240

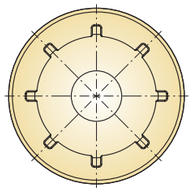
Recommended Tightening Torque for the Collet Nut (Slim Type)

Collet Chuck Size	Clamping Range (mm)	Max. Tightening Torque (Nm)
ER8M	0.2 ~ 5.0	6
ER11M	0.2 ~ 2.9	8
	3.0 ~ 7.0	16
ER16M	0.2 ~ 1.0	8
	1.5 ~ 3.5	20
	4.0 ~ 10.0	24

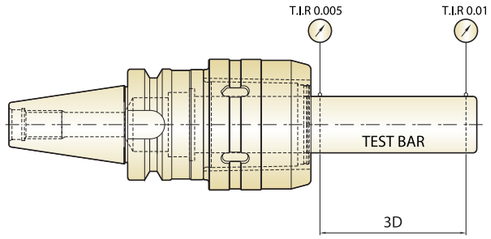
Collet Chuck Size	Clamping Range (mm)	Max. Tightening Torque (Nm)
ER20M	1.0	16
	1.5 ~ 13.0	28
ER25M	1.0 ~ 3.5	18
	4.0 ~ 17.0	24

POWER MILLING CHUCK

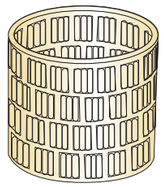
- Rigidity is strengthened through slot made at inside milling chuck, which prevents deformation of milling chuck. Smooth cutting is achieved by maximizing end mill clamping power.
- Enough thickness of clamping part prevents chattering and ensures durability.



- High precision can be achieved through accurate roundness of clamping part, deburred surface and rigidity. (deviation of concentricity : below 2, roughness : below RZ B1.0~1.5)
- Maintaining T.I.R not exceeding 0.01mm at 3D from nose part.



- 160% more of bearings are used in needle roller than other make's chucks, which provides strong clamping power and high durability by dispersing surface pressure even in case strong load is applied.



In order to improve durability, YG-1 Milling Chuck is passed through following processes.

- "Normalizing" treatment for unifying material composition and removal internal stress.
- Ultralow temperature (-90°C) treatmemt called "Sub-Zero treatment"after carburizing heat treatment for prior removal of any deformation of milling chuck after use for long periods of time.

POWER MILLING CHUCK

Feature

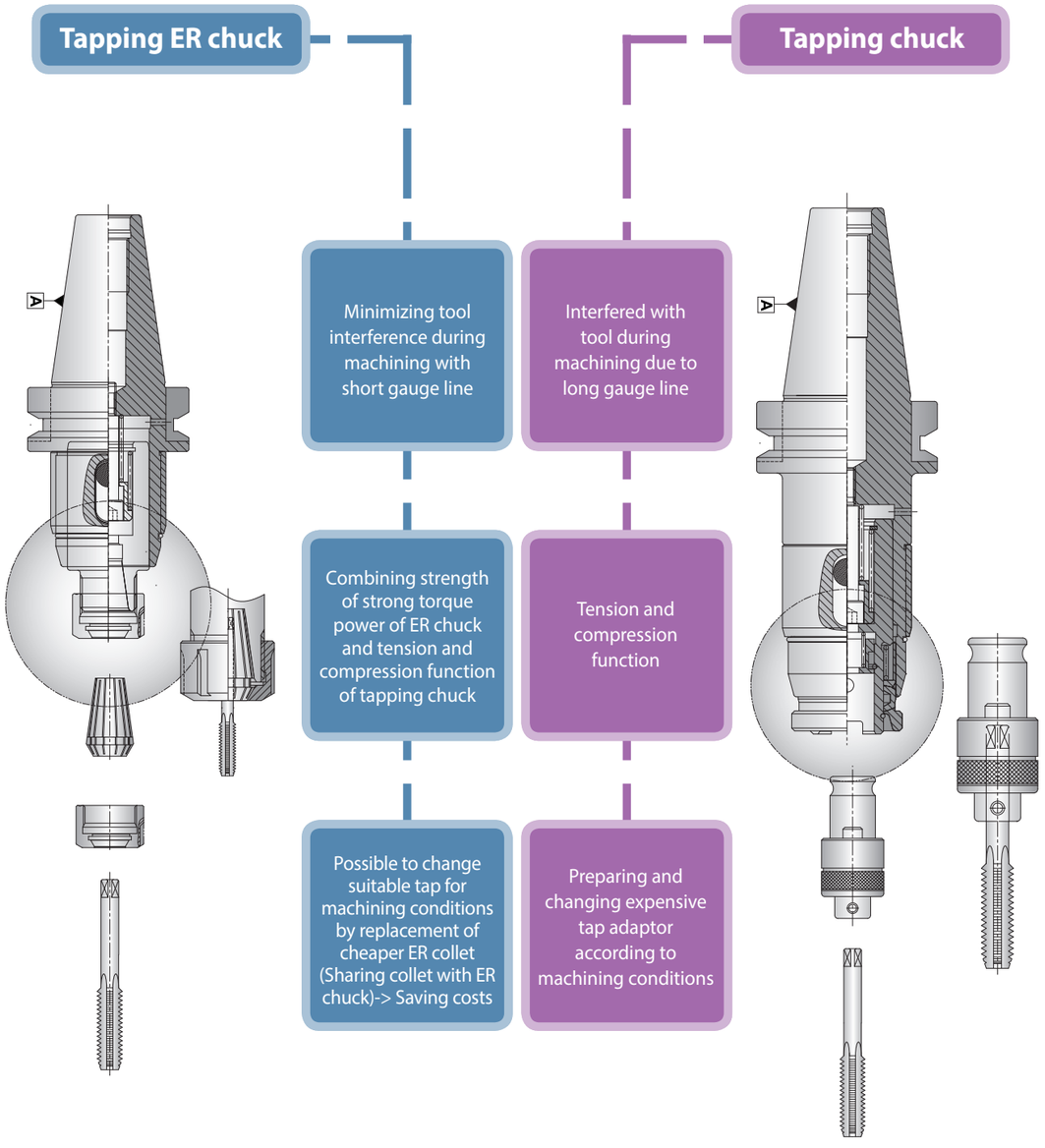
High-Speed POWER MILLING CHUCK

- Achieving optimum cutting for High-Speed heavy duty cutting and finishing with strong torque power
- Perfect clamping from 3mm depth of I.D entrance
- Achieving stability when exchanging and setting tools by stable fastening and unfastening torque

Strong Torque Power

Milling chuck (I.D)	Standard	Tolerance (Taper shank)	Run-Out	Clamping torque
C20	AT3	ISO 30 (0~+0.002) ISO 40 (0~+0.003) ISO 50 (0~+0.004)	0.01mm at 3D	980Nm
C25				1,760Nm
C32				3,430Nm
C42				4,900Nm

TAPPING ER CHUCK & TAPPING CHUCK



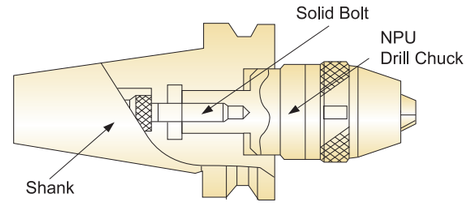
NC DRILL CHUCK

Feature

YG-1 Drill Chuck is completely tightened with solid bolt, and there is no danger of falling during rotating or cutting.

High Precision

- Drill chuck with excellent high precision (T.I.R 0.05mm) and shank are integrated, which guarantees excellent T.I.R



Strong Chucking Power

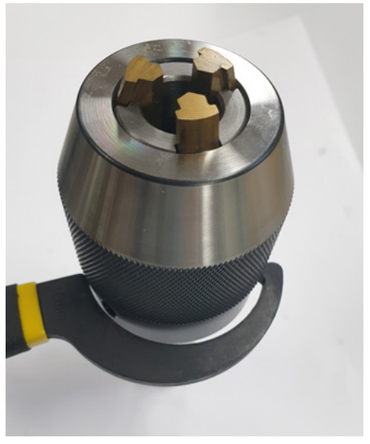
Drill may be damaged due to reverse thrust during perforation, but with YG-1 Drill Chuck strongly tightened with wrench, there is no possibility of damage to drill.

Safety

YG-1 NC Drill Chuck with strong rigidity contributes to factory automation by unmanned operation by preventing accident from occuring during operation.

- Falling of drill occurring by sudden stopping
- Falling of drill occurring by rapid rotation
- Damage to drill caused by reverse thrust during perforation process

Clamping Method



▲ Keyless Type

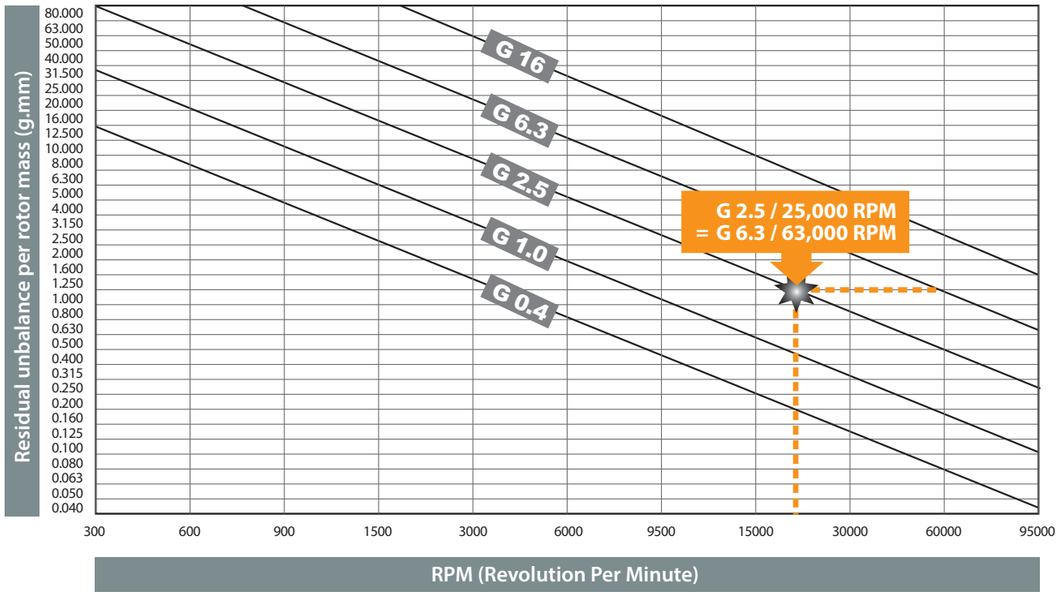
▲ Hex. Key Type

BALANCING

Definition of Balancing and Unbalancing

If the rotor(tool holder) is rotated around the axis, centrifugal forces generate in all parts. If these centrifugal forces are distributed symmetrically against the rotation axis, the centrifugal forces generating in the opposite direction are offset by one another, resulting in no forces to the rotation axis eventually. Therefore bearings are not vibrated. In this case tool holder is in the balanced state. On the contrary, if centrifugal forces are distributed asymmetrically against the rotation axis, or if the force of one part is greater than that of the opposite part, the forces equivalent to differences are added to the rotation axis, causing the rotor(tool holder) to vibrate. The imbalance of distribution of rotor mass is called "Unbalance". In other words, "Unbalance" is mass existing unevenly in the rotor(tool holder).

Balancing Grade Quality According to DIN ISO 1940



Calculation of G $\frac{G \times m}{RPM} \times 9549 = U$

G : Balancing grade or circumference speed
m : Rotor(Holder) weight ⇒ Unit : kg
9549 : Conversion constant
U : Degree of unbalance (Permissable unbalance) ⇒ Unit : g.mm
RPM : Revolutions Per Minute

Merits of Balanced Machining

Recently, rotating machines are more sophisticated and operated at High-Speed with the technical advance. Also, they require more efficiency and more stable functions which are stricter conditions than ever before. In High-Speed machining, one of the largest factors which degrade performance of machines is chattering. It causes workers to suffer displeasure, noise, and fatigue which are main problems affecting productivity. Balancing of the rotor(tool holder) is the essential and effective factor in order to prevent vibration of the machine. It is widely recognized as the indispensable process in manufacturing rotation machinery. YG-1 manufactures tool holders with various balancing grades meeting the needs of users.

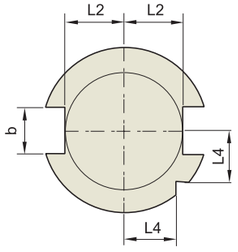
Balancing Grade Standard

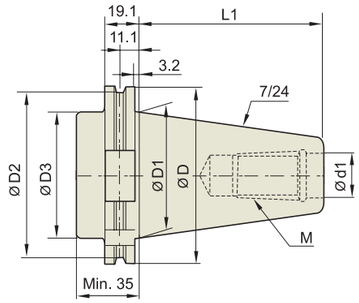
Balancing Specification for Balancing Design Products

PRODUCT	SHANK	GRADE	RPM
HYDRAULIC CHUCK	BT/CBT 30/40/50 SK 30/40/50 HSK 32/40/50/63/80/100	G 2.5	25,000
SHRINK FIT HOLDER	BT/CBT 30/40/50 SK 30/40/50 HSK 25/32/40/50/63/80/100 ISO 25	G 2.5	25,000
OTHER CHUCKS & TOOL HOLDERS	BT/CBT 30/40/50 SK 30/40/50 HSK 25/32/40/50/63/80/100 ISO 20/25	G 6.3 G 2.5	15,000 25,000

※ **Higher Balancing Grade Product Could Be Supplied Upon Customer's Request.**

SHANK DATA - DIN 69871 (ISO 7388-1)

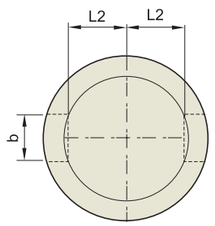


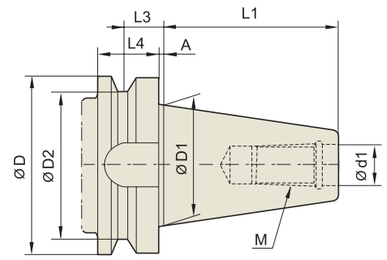


Unit : mm

TAPER No.	ØD	ØD1	ØD2	ØD3	Ød1	L1	L2	L3	L4	b	M
SK30	50	31.75	44.3	45	13	47.8	16.4	19	15	16.1	M12×1.75
SK40	63.55	44.45	56.25	50	17	68.4	22.8	25	18.5	16.1	M16×2.0
SK50	97.5	69.85	91.25	80	25	101.75	35.5	37.7	30	25.7	M24×3.0

SHANK DATA - JIS B6339/MAS 403 (ISO 7388-2)

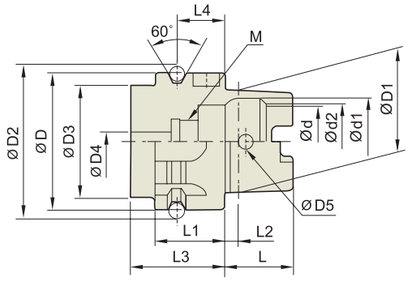


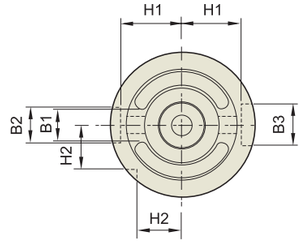


Unit : mm

TAPER No.	ØD	ØD1	ØD2	Ød1	L1	L2	L3	L4	A	b	M
BT30	46	31.75	38	12.5	48.4	16.3	13.6	20	2	16.1	M12×1.75
BT40	63	44.45	53	17	65.4	22.6	16.6	25	2	16.1	M16×2
BT50	100	69.85	85	25	101.8	35.4	23.2	35	3	25.7	M24×3
BT60	155	107.95	135	31	161.8	60.1	28.2	45	3	25.7	M30×3.5

SHANK DATA - DIN 69893/ISO 12164





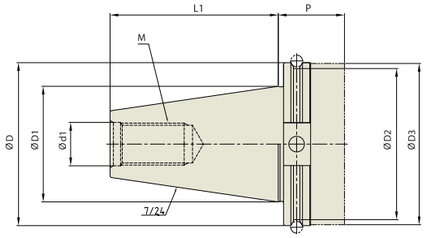
Unit : mm

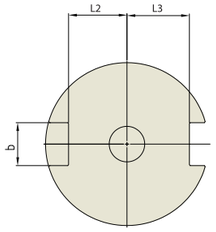
TAPER No.	ØD	ØD1	ØD2	ØD3	ØD4	ØD5	L	L1	L2	L3	L4
HSK32A	32	24	37.00	26	4.2	4.0	16	20	3.2	35	16
HSK40A	40	30	45.00	34	5.0	4.6	20	20	4.0	35	16
HSK50A	50	38	59.30	42	6.8	6.0	25	26	5.0	42	18
HSK63A	63	48	72.30	53	8.4	7.5	32	26	6.3	42	18
HSK80A	80	60	88.8	68	10.2	8.5	40	26	8	42	18
HSK100A	100	75	109.75	88	12.0	12.0	50	29	10.0	45	20

Unit : mm

TAPER No.	Ød	Ød1	Ød2	B1	B2	B3	H1	H2	L4
HSK32A	17	20.5	19	7.05	7	9	13.0	9.5	M10×1.0
HSK40A	21	25.5	23	8.05	9	11	17.0	12.0	M12×1.0
HSK50A	26	32.0	29	10.54	12	14	21.0	15.5	M16×1.0
HSK63A	34	40.0	37	12.54	16	18	26.5	20.0	M18×1.0
HSK80A	42	50	46	16.04	18	20	34	25	M20×1.5
HSK100A	53	63.0	58	20.02	20	22	44.0	31.5	M24×1.5

ASME B5.50





ASME B5.50-CAT (OLD : 1978)

Unit : mm

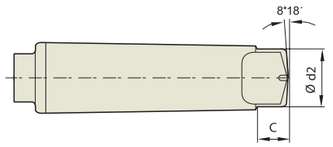
TAPER No.	ØD	ØD1	ØD2	ØD3	Ød1	L1	L2	L3	b	P	M
CAT30	50	31.75	44.3	31.75	13	47.625	16.25	18.67	16.1	-	UNC1/2-13
CAT40	63.55	44.45	56.25	44.45	17	68.25	22.6	25	16.1	-	UNC5/8-11
CAT50	97.5	69.85	91.25	70.1	25	101.6	35.3	37.7	25.7	-	UNC1-18
CAT60	155	107.95	132.56	108	32	161.93	54	59.3	25.7	-	UNC1 1/4-7

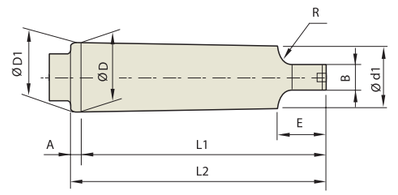
ASME B5.50-CAT (NEW : Revision 2009)

Unit : mm

TAPER No.	ØD	ØD1	ØD2	ØD3	Ød1	L1	L2	L3	b	P	M
CAT30	46.02	31.75	38.89	46.02	13	47.625	16.25	18.67	16.1	-	UNC1/2-13
CAT40	63.5	44.45	56.36	63.5	17	68.25	22.6	25	16.1	-	UNC5/8-11
CAT50	98.43	69.85	91.29	98.43	25	101.6	35.3	37.7	25.7	-	UNC1-18
CAT60	139.7	107.95	132.56	139.7	32	161.93	54	59.3	25.7	-	UNC1 1/4-7

DIN 228

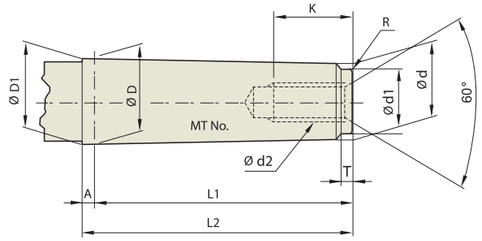




DIN 228 (MORSE TAPER) TANG TYPE (MTA)

Unit : mm

TAPER No.	TAPER RATIO (Rad)	TAPER ANGLE (α)	ØD	A	ØD1	Ød1	L1	L2	Ød2	B	C	E	R
MT0	1/19.212	1°29′27″	9.045	3	9.045	6.104	56.5	59.5	6.0	3.9	6.5	10.5	4
MT1	1/20.047	1°25′43″	12.065	3.5	12.065	8.972	62.0	65.5	8.7	5.2	8.5	13.5	5
MT2	1/20.020	1°25′50″	17.780	5	17.780	14.034	75.0	80.0	13.5	6.3	10	16	6
MT3	1/19.922	1°26′16″	23.825	5	23.825	19.107	94.0	99.0	18.5	7.9	13	20	7
MT4	1/19.254	1°29′15″	31.267	6.5	31.267	25.164	117.5	124.0	24.5	11.9	16	24	8
MT5	1/19.002	1°30′26″	44.399	6.5	44.399	36.531	149.5	156.0	35.7	15.9	19	29	10
MT6	1/19.180	1°29′36″	63.348	8	63.348	52.399	210.0	218.0	51.0	19.0	27	40	13
MT7	1/19.231	1°29′22″	83.058	10	83.058	68.186	286.0	296.0	66.8	28.6	35	54	19

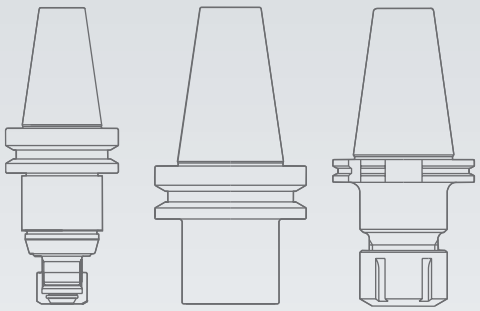


DIN 228 (MORSE TAPER) SCREW TYPE (MTB)

Unit : mm

TAPER No.	TAPER RATIO (Rad)	TAPER ANGLE (α)	ØD	A	ØD1	d	L1	L2	Ød1	d2	K	T	R
MT0	1/19.212	1°29′27″	9.045	3	9.201	6.442	50	53	6.4	-	-	4	0.2
MT1	1/20.047	1°25′43″	12.065	3.5	12.230	9.396	53.5	57	9.4	M6	16	5	0.2
MT2	1/20.020	1°25′50″	17.780	5	18.030	14.583	64	69	14.6	M10	24	5	0.2
MT3	1/19.922	1°26′16″	23.825	5	24.076	19.759	81	86	19.8	M12	28	7	0.6
MT4	1/19.254	1°29′15″	31.267	6.5	31.605	25.943	102.5	109	25.9	M16	32	9	1
MT5	1/19.002	1°30′26″	44.399	6.5	44.741	37.584	129.5	136	37.6	M20	40	9	2.5
MT6	1/19.180	1°29′36″	63.348	8	63.765	53.859	182	190	53.9	M24	50	12	4
MT7	1/19.231	1°29′22″	83.058	10	83.578	70.058	250	260	70.0	M33	80	18.5	5

Global Cutting Tool Leader **YG-1**



TOOLING SYSTEM