



# Only Micron Chuck can guarantee such runouts as 0.001mm at chuck nose and 0.002mm at 3xD.

Micron Chuck was developed utilizing Showa original direct clamping mechanism and assembling technology acquired in manufacturing high quality machine spindles for a long experience.

#### How to measure runout



GRADE	NOSE	3D POINT
AA	1	2
А	3	5

Tool will be supplied with an inspection sheet.

#### • Structure of Micron Chuck



#### • Structure of other makers' chuck





### Clamping power as high as other milling chucks.

High accuracy Micron Chuck has a high clamping power,too. The clamping power of Ø32 ID Micron chuck is 2,450Nm, and Ø6 ID 49Nm - about 2 times bigger than hydraulic chucks.

# Standard type Micron Chuck 2,450N•m



### The cutter is not axially moved by clamping

The cutter is not withdrawn by clamping like collet chucks, due to its unique mechanism. It is required in mass manufacturing line to preset cutter length to close tolerance. In case of collet chuck, the axial cutter projection is shortened by clamping. The back end of the cutter is pressed to the back-up screw at that time, which may cause bending and breakage of small dimeter cutters.





### Highly balanced and sealed chuck.

Maximum speed :

20,000min<sup>-1</sup> (Standard HPC-H chuck) 30,000min<sup>-1</sup> ("G" type HPC-H chuck)

		#30,#40 HSK50, 63	#50 HSK100	
Standard	А	$10.000 \text{min}^{-1}$	8.000min-1	
Standard	AA	10,0001111	8,000mm	
	А	20.000min-1	12 000min-1	
Н	AA	20,00011111	12,00011111	
	G	30,000min <sup>-1</sup>	_	
М	_	15,000min <sup>-1</sup>	10,000min <sup>-1</sup>	





### Thru-the-tool coolant type.

Thru-the-tool coolant type Micron Chucks available. Please specify it at the time of ordering.





### Mechanical chuck, Heater is not required.

Shrink-fit holders have restrictions of cutter material. But, Micron Chucks are applicable to any material of cutters, keeping high accuracy for a long period of time.





### Wide range of IDs are available.

Standard type, "H" type and "M" type Micron Chucks covers from ø3mm to ø50mm ID.



### Wide application range.

You can extend application range of Micron Chucks by using straight collets. But, direct chucking is recommended to obtain the highest performance.

#### COMPARISON OF RUNOUT & SURFACE FINISH

	MICRON CHUCK	HYDRAULIC CHUCK	COLLET CHUCK	REMARKS
	Ø	$\bigtriangleup$	$\bigtriangleup$	
Runout	AA grade : 1μm at chuck nose, 2μm at 3×D guranteed.	$3\mu$ m at chuck nose, $5\mu$ m at 3×D.	N made AA grade collet : 5µm at 4×D (There is no guarantee at the time of attaching the holder)	Micron chuck : Measured runout. Others : From catalog.
	Ø	$\bigtriangleup$	O	
Clamping Power	¢6 49N⋅m ¢32 2450N⋅m	26.5N·m (N made ø6 chuck)	49N∙m Showa ø6 collet (10 ID max. holder)	Measure value [ø6 49N•m] is the maximum of HPC06H long type
	0	×	$\bigtriangleup$	
Maintenance	Periodical greasing since a mechanical chuck.	Periodical check of oil leak required.	Chips must be removed from collet.	
	Ø	Ø	×	
Presetting	Easy presetting, since cutter is stable.	Easy presetting, since cutter is stable.	Cutter is axially moved by chucking.	

### **Clamping power & Tightening Force**

#### Standard



Chuck size	Clamping Power (MIN) (N • m)	Tightening Force (N ⋅ m)	Loosening Force (N・m)
HPC16	780		
HPC20	1180		
HPC25	1760	62	40
HPC32	2450		
HPC42	3920		

**H-series** 



Chuck size	Clamping Power (MIN) (N • m)	Tightening Force (N ⋅ m)	Loosening Force (N・m)
HPC03H	10 (10)		
HPC04H	15 (15)		
HPC06H	30 (20)		
HPC08H	40 (24)	67	67
HPC10H	60 (35)	07	67
HPC12H	70 (41)		
HPC14H	80		
HPC16H	90		

Clamping power of short type chucks (L=75mm max) is shown in ( ).

M-series

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Chuck size	Clamping Power (MIN) (N · m)	Tightening Force (N ⋅ m)	Loosening Force (N・m)
HPC03M	5		
HPC04M	7		
HPC06M	20	57	57
HPC08M	26	57	57
HPC10M	33		
HPC12M	46		



N-series



Chuck size	Clamping Power (MIN) (N · m)	Tightening Force (N ⋅ m)	Loosening Force (N・m)
HPC03N	2		
HPC04N	4		
HPC06N	20	50	50
HPC08N	26	50	50
HPC10N	33		
HPC12N	46		

### **Application examples**

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Workplace	Cylinder Head Valve Guide Hole (FCD)	
Cutting tool	Carbide Reamer 6mm×135L	
Conventional Chuck	Competitor's Collet Chuck	
SHOWA Chuck	SHOWA Micron Chuck HSKA63-HPC10H-105A	
Test result	<ul> <li>①Though conventional collet chuck required 30min to achive 10micron runout. SHOWA Micron chuck was able to achieve 3 - 5micron at 8xD with just one clamping.</li> <li>②As a result, a longer tool life is realized from 50 - 100 holes to 1600 holes.</li> </ul>	





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Workplace	Cylinder Block Oil Jet Hole (FC230)	Г
Cutting tool	Carbide Reamer 9mm×180L	
Conventional Chuck	Hydraulic Chuck+Straight shank shrink fit extension	
SHOWA Chuck	SHOWA Micron Chuck HSKA63-HPC10M-254	
Test result	Increased cutting tool life from 400 to 1000 holes, thereby reducing cutting tool costs and tool changing costs	ĺ



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Workplace	Hydraulic Parts Cover (ADC12)			
Cutting tool	Carbide Step Reamer 20mm×200L			
Conventional Chuck	Competitor's Milling Chuck			
SHOWA Chuck	SHOWA Micron Chuck BT40-HPC25-105A			
Test result	Image: Market state sta			
	C/NO more chattening			





# Micron Chuck

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Workplace	Cylinder Head Cubing (ADC)
Cutting tool	Diamond Reamer
Conventional Chuck	Competitor'S Hydraulic Chuck
SHOWA Chuck	SHOWA Micron Chuck HSKA63-HPC25-115AA
Test result	Hydraulic chuck produced oval holes.Micron chuck produced perfect circular holes.



#### Ball screw mechanism is employed first time to milling chuck.

USA PAT. JP PAT.

A long seller Collet Chuck which employs ball screw mechanism for the first time in the world. Various shank types and sizes are available for wide range of applications.



### Clamping power increased by $3{\sim}5$ times.

The ball screw creates high clamping power by drawing in the cutter when the nut is tightened. The high clamping power is obtained in any place of the spring collet. Clamping power is multiplied by  $3\sim5$  times compared with non-ball screw chucks.





### Accuracy is increased by original spring collet.

High accuracy is obtained, since the collet is free from twisting force due to the thrust ball structure. SHOWA original way of manufacture and heat treatment, high accuracy of the Spring Collet is maintained for a long period of time.





### High rigidity is realized by thick wall structure.

Very thick wall of Hard Chuck provides high chucking power, high rigidity and accuracy, even in hard jobs.





### Very easy to clamp and unclamp.

The SHOWA original ball screw mechanism provides easy chucking. clamped and unclamped only by a half turn of the nut. (The nut is fixed by a built-in braking mechanism)







Wonderful power of steel ball

Steel balls are used as a rolling transmission, by which the chuck can be clamped with less hand power. The ball screw race of the nut and chuck body is finished by close tolerance grinding, to realize highest accuracy, chucking power and rigidity.

# COLLET CHUCK







### High accuracy collet

 High accuracy collets are used.
 The Collet is made of quality alloy steel which minimizes strain and wear.



Grado	Runout		
Orade	Nose	4D Point	
AA	1µm	3µm	



### Smallest diameter is 0.5mm.

сниск	COLLET I.D. (mm)	GRIPPING RANGE (mm)
RSC07	ø1~ø7	0.5
DCC10	ø1~ø3	0.5
RSC10	ø4~ø10	1.0
DCC12	ø1~ø3	0.5
R3013	ø4~ø13	1.0
DSC16	ø1.5~ø3	0.5
KSCIO	ø4~ø16	1.0
RSC20	ø2~ø3	0.5
	ø4~ø20	1.0





### Wide use collet.

Standard 16°(DIN6499/ISO15488) taper collet, the most popular in world. Major CNC makers are adopting this collet as standard items for milling collet chucks.



### Through-the-tool coolant

For coolant thru the tool application. High pressure up to 7 Mpa is acceptable. Standard holders and nuts can be used. Bearing of nut is not affected by coolant.





### Nut and Adjust screw



Ball bearings are used to reduce friction. Trapezoidal thread is used for higher accuracy.





### **Special coating**

Holder doesn't rust due to special rust proof treatment on full surface.



# SYNCHRO TAP HOLDER MODEL SYFN, SYFS

#### INFINITESIMAL FLOATING SYNCHRONIZED TAP HOLDER

Screw processing is processed by self-propelled rotation of one rotation and one pitch, so there is no stability of screw precision (angle) and blade life unless it is 100% synchronized. Gauge is also required for screw precision, but unless angle and circularity are out, it can not be said that the accuracy of first and second grade is high. Machine and tap as well as manufacturing, because there is processing tolerance, it is impossible to make it 100%, so tap holder with minute stretch and radial float mechanism is necessary.



### **Compensates for synchronous error**

It compensates for synchronous error not only axially,but also radially. Infinitesimal radial error caused by machining can be corrected by the original mechanism.



### Structure

Maintenance is not needed by using durable O-ring. Since through-the-tool coolant and also alongsidethe cutter coolant can be applicable, standard tap can be usable as well. Maximum coolant pressure of

SYFN : 7 M pa is applicable. SYFS : 5 M pa is applicable.





### Tap holder for small diameter

Tap holder for small diameter doesn't clamp tap by collet, but clamps tap directly, and this makes it possible to avoid breakage of M1, M1.6 and M2, too.



### Acceptable tap size

HOLDER	COLLET	JIS TAP SIZE
SYFS02	_	M1,M1.6,M2,No3,No4
SYFS03	_	M3,No5,No6
SYFN12	CR13GB/GH	M4~M12,No8~U1/2,P1/8
SYFN20	CR20GB/GH	M4~M20,U5/16~U5/8,P1/8~P3/8



### **Machining Performance**

Test cut with synchro tap holder and collet chuck with the same program.

#### Difference when processing resin material

- Left: Synchro tap holder SYFN type has good thread thread accuracy, and transparency is high because the load on the cutter is reduced.
- Right: In the fixed holder (collet chuck), transparency is low.

With the Synchro Tap infinitesimal float is used, increasing the degree of transparency, thereby illustrating the accurancy of threads are improved.



Left:SYFN Right:Collet Chuck

#### Difference when small diameter tapping.

Work	R6-Block			
Material	Aluminum			
Holders	BT30-EDC06-090 BT30-SYFS02-095			
Cutting tools	M1.6×0.35 TAP			
Cutting conditions	N=260min-1 F=910min/min			
Life	Exchange in about 200 holes (requiring regrinding)Exchange in about 200 holes (requiring regrinding)			
Effect	Improvement of cutting tool life (about twice)			

DIMENSIONS BT > P.63 | SK > P.103-105 | HSK > P.130



By a super slim body, it minimizes the interference of work & jig.





CODE	øD	CHUCK
ER11MN	16	SSC07
ER16MN	22	SSC10
ER20MN	28	SSC13
ER25MN	35	SYFN16S



POINT

# Standard 16° (DIN6499/ISO15488) taper collet, the most popular in world.

#### ①Smallest diameter is 0.5mm

СНИСК	COLLET I.D. (mm)	GRIPPING RANGE (mm)
SSC07	ø1~ø7	0.5
SSC10	ø1~ø3	0.5
	ø4~ø10	1.0
SSC13	ø1~ø3	0.5
	ø4~ø13	1.0
SYFN16S	ø1.5~ø3	0.5
	ø4~ø16	1.0

<sup>(2)</sup>High accuracy collets are used.

③The Collet is made of quality alloy steel which minimizes strain and wear.





GRADE	RUNOUT		
	NOSE	4D POINT	
AA	1 <i>µ</i> m	3µm	



### Long adapter for synchronized tap holder (COLLET CHUCK SLIM TYPE)

It is possible to use it as a long adapter by chucking it with Synchro Tap Holder SYFN20 type.



ADAPTER MODEL	øD	øD1	L4	М
ST16-SSC07-L	16	16	50, 100 150	M6
ST20-SSC10-L	22	20	50, 100 150, 200	M10
ST20-SSC13-L	28	20	100 150	M12

TAP HOLDER MODEL	øD	øD1	L2	М
SYFN16S-L2	35	_	35,65 95,125,155	M16

When it is necessary to dig a deeper hole for tap processing of M14-M16, it is possible to use by tap holder SYFN16S type without long adopter.



### It is available as a long adopter for small diameter drill processing

## TRACTION DRIVE SPEED ACCELERATOR

Full-functions in a compact body.



### **Basic principle**

- ①Power of the traction drive is transmitted by the rolling contact mechanism via oil film of traction grease characterized by high viscosity at high pressures.
- <sup>(2)</sup>Contact pressure P is created at each contact surface on planetary rollers, a sun roller and a stationary housing, which are assembled with elastic deformation.

By this pressure, the oil films changes to high viscosity one (only when contact pressure P is imposed) so that the power can be transmitted at the roller contact area.

③The traction force T is formulated by Equation (1).

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T=μP ······(1)
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where, µ:Traction coefficient, P:Contact pressure

(4) This unit is a speed increasing device which the revolution of the planetary roller is used for input side and the rotation of the sun roller is output side.

The speed increasing ratio is formulated by Equation (2).

$$n=1+\frac{D}{d}$$
 .....(2)

where, D:Bore diameter of stationary housing d:Outside diameter of sun roller



### Features



#### **Positioning Block**

(Optional for use on M/C) The positioning block and pin mechanism supplies coolant to the tool.

#### **Positioning Pin**

"One-touch" adjustment, with in a height range of 40mm.

#### Nut

The balance adjustment is already made in the factory.

More widely usable, due to its adaptability to a great variety of M/C spindles.



#### **Orientation Ring**

The fitting position of a positioning block differs among machining centers. The position can be adjusted by rotating the orientation ring within 360°.

#### **Coolant Nozzle**

The angle adjustment of the coolant nozzle can be made easily by hand. The spray angle of the coolant is adjusted to match the inserted cutter length.

#### Collet

Only a under super precision collet, runout within 3 microns, should be used. Various sizes can be supplied by mm unit. Please order sizes to match the shanks of tools to be used.

#### Cutters

A drill, end mill and grinding wheel with a straight shank can be applied.

#### ATC-Ready

Compact and light, the TDU is ready for ATC... with no extra attachments necessary.

#### Low Vibration

The Traction Drive Unit is particularly smooth-running, and without noise vibration, it even makes grinding possible on your M/C.

#### Transmission Power

A stable torque transmission produced stable rpm, unlike air motor speed accelerators.

#### High Speed

Since the traction drive is run by a transmission mechanism based on rolling contact, high lubrication can be maintained even at high speed rotation.

The uses of ceramic bearings and through-body coolant are incorporated to ensure reliable, long-lasting high speed operation. POIN 3

### A complete series supports a full range of applications.

### **TDU40**

Super rigid Type

3.4×Spindle rev. Max.12,000rpm





**Standard Type** 

6×Spindle rev. Max.30,000rpm





#### Cutting Example [Groove Milling]

Material : Aluminum alloy End mill : 16mm dia. T/C, 2-blade Speed : 12,000rpm Cut. depth: 5mm : 1000mm/min Feed



#### Cutting Example [Groove Milling]

Material	;	Aluminum alloy
End mill	:	4mm dia. T/C, 2-blade
Speed	:	28,000rpm
Cut. depth	:	2mm
Feed	:	1,000mm/min

	Super rigid type	Standard type		
Туре	TDU40	TDU17-N		
Speed increasing ratio	3.4×	6×		
Speed (rpm) (min <sup>-1</sup> )	MAX. 12,000	MAX. 30,000		
Output torque (Nm)	7	1		
Output power (kw)	8.8	3.1		
Taper *2	BT50	BT40 / BT50		
Tool grip diameter (mm)	¢1.5~20	¢0.5~10		
Net weight (kgW)	11.5	5.4 / 7.9		

\*1 Max. output for each max. speed.

\*2 Other tapers are also available: SK40,CV40,HSK63 equivalent to BT40. SK50,CV50,HSK100 equivalent to BT50.

Warranted total running time : 2,000hrs Period of warranted : One year



# HY-DUAL CHUCK PAT.

TOOL HOLDER FOR DIFFICULT TO MACHINE MATERIALS

POINT
1
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### **Dual-clamping method**

Dual chucking by Hydraulic & Mechanical Only high rigidity & high clamping power can prevent the end mill from being pull-out and can prevent chattering. SHOWA has solved the so-called "wooden pestel phenomenon" which causes the pulling out of end mill, by clamping the cutting tool's shank nose & shank end. "Vibration" caused by chattering is removed by the attenuation mechanism of hydraulic and spring.



### Structure

Simple chuking by a single to be made by SHOWA (Japanese and American, patent acquistion finished) SHOWA present one action, easy chuking (Patent acquired in Japan and USA).





### "Wooden pestel phenomenon"

A tool, while being deformed by a bending moment in the milling process, twists in the tool holder, the deformation occurs repeatedly by high pressure in a short stroke. (Bending moment: Bending resistance R (N) x tool protruding amount L (m)). The mouths of both the collet and the holder will expand and wear flare by this movement. These mouths are easily deformed by the principle of leverage, as the ratio below is increased. L (tool protruding amount) /H (tool gripping length) The material such as steel having a lower Young's modulus is more likely to deform than the carbide of the tool. A circumference difference  $[e=\pi(D1-D)]$  occurs between the tool shank and the holder mouth because of abrasion expansion. The tool turns more than the holder and at the same time it starts pulling out little by little. In addition, debr is generated in the worn area creates a rust ring and is adhered mainly to the shank. It is considered that, as measures, to reduce the bending moment is mainly common.





### **Machining Performance**

Test cut with Hy-Dual chuck and conventional milling chuck in the same program

#### Comparison of surface roughness

- Holder in use : BT50-HDU20-100(HY-DUAL CHUCK) BT50-HPC20-105(MICRON CHUCK)
- Cutting tool
   Six flutes Cemented carbide endmill
- Work materials : SKD61
- Cutting condition

Ap	Ae	Rotational speed	Feeding rate	Tool projection
30mm	lmm	1900min-1	1920mm/min	55(L/D=2.75)mm

#### Result: improvement of surface roughness was observed



### <BORING SYSTEM> FIRSTCUT [Small-hole Boring Tool]

#### **Precision Tuning Small-holeBoring Tool**



A Higher Level of Stability A Higher Level of Stability



DIMENSIONS	BT > P.72   HSK > P.135   ST > P.150
DIMENSIONS	JIG BORER TOOLS, COLLET, INSERTS > P.73, 136
DIMENSIONS	EXTENSION, REDUCTION > P.74, 137

#### High Rigidity Pre-balanced Design

Square slide, through feed screw, steel balls on both sides of feed screw, feed screw fixed with double screws, and backlash-adjusted internal thread: very robust structure without any gaps.

The feed screw is polished at high precision and thus moves smoothly, allowing for accurate dimensional adjustment with the dial scale (backlash-free). The dial is calibrated to 0.01 mm for FIC2NJ, 0.005 mm for FIC1NJ.



#### With auxiliary ring

An auxiliary ring is placed on the outer circumference of the dial. Rotating this manually makes dimensional adjustment easier and eliminates reading errors.



#### Throwaway Boring Tool

We utilize our own proprietary design for our throwaway boring tools. These tools are designed to minimize cutting resistance and fully utilize the tip features, in order to avoid making trumpet-shaped machined holes. ISO tips can be used. The shank has a coolant hole that allows the reliable supply of through coolant to the blade edge.

The heads can be used with through coolant systems, provided that you use our dedicated throwaway tools.

### <BORING SYSTEM> **FIRSTCUT** [Machining diameter Φ25-Φ73]

#### **Adjustable Boring for Ultra-precision Finish**



Adjustable Boring System for Ultra-precision Finish Achieved by High-precision Feeding



DIMENSIONS	BT • P.71   HSK • P.134   ST • P.150
DIMENSIONS	THROWAWAY SQUARE SHANK TOOLS, INSERTS > P.73, 136
DIMENSIONS	EXTENSION, REDUCTION ▸ P.74, 137

#### Eliminating the Staggering of Blade Edge Dimensions

### The blade edge does not stagger even when the slide is locked.

The slight clearance between the slide and the body hole is properly adjusted. In addition, a locking pad is placed between the lock bolt and slide, preventing torsional action on the slide at tightening. Moreover, the lock is set in a slanting direction so as to deal with both the main and feeding force components of the cutting resistance force. These measures thus eliminate staggering of the blade edge when locking the slide.



#### Backlash-free Dial Calibrated to 0.01 dia.

#### Direct reading accuracy of 0.01 dia.

The dial is very easy to read because a gear is incorporated to widen the calibration pitch. In addition, its structure eliminates backlash, thereby improving its operability.

#### **High Feeding Precision**

#### Accurate feeding is maintained via the high-precision feed screw.

The feed screw, an essential point of feeding precision, has been polished with high precision after heat treatment. For this reason, it will maintain a highly accurate feed, allowing the user to reliably correct

dimensions on the machine.

#### Support for through coolant

#### Coolant is reliably supplied to the blade edge.

Through a steady supply of coolant, chippings are easily expelled and both the blade edge and machined area of workpieces can be prevented from heating up. This has the following benefits:

Improved tip lifetime

- 2 Higher cutting speed/cutting feed
- 3 Improved surface roughness of workpieces
- Improved dimensional accuracy of workpieces

As a result, you can expect accurate machining at high efficiency.



#### Reinforced Machining Stability

### A guide groove on the body ensures stable machining.

In order for the body to securely absorb the cutting resistance force, it is equipped with a polished guide groove to keep the blade fixed, thus absorbing the component force and improving machining stability.





### <BORING SYSTEM> **FIRSTCUT** [Machining diameter Φ70-Φ360]

#### Adjustable Boring for Ultra-precision Finish



Adjustable Boring System for Ultra-precision Finish Achieved by High-precision Feeding



DIMENSIONS	BT > P.71   HSK > P.134   ST > P.150
DIMENSIONS	THROWAWAY SQUARE SHANK TOOLS, INSERTS > P.73, 136
DIMENSIONS	EXTENSION, REDUCTION > P.74, 137

#### High-rigidity clamp holding structure

The body and slide part are integrated with a hand-finished dovetail that is aligned to the actual workpiece and held fixed with clamp bolts. Since it is constrained in two places (the taper area of the dovetail and the bottom surface) a highly rigid assembly is ensured.

#### Use of Precision Screws

FIC150N, FIC220N, FIC290N use polished worms/worm wheels, allowing fine-tuning with a precision of 0.01 dia. by direct reading.



#### Wide Variety of Blade Edges

We adopt 90°square shank tool, and when choose L-type square shank tool, then back boring is available.

We adopt ISO insert chip so according to the work you can select from chips made by any tool manufacture.

% L-type square shank tool for back boring and back cover to be quoted separately.





#### Wide Machining Range

By using square shank tools, wider machining range that cannot normally be achieved with a normal boring head can be obtained not only by moving slide but by projecting square shank tools. Moreover, well balanced machining can be achieved by mainly adjusting the projection of shank tool and then decreasing the slide opening for the tuning.



# SHOWA SKM TOOL SYSTEM

TOOL HOLDERS FOR MULTI-TASKING MACHINE

### Features

#### High rigidity

SKM's hollow shank is deliberately thin and flexible, so it expands more than the socket of spindle and tightens when rotating at high speed. As the drawbar retracts, it expands the collet and pulls the shank back into the socket, compressing the shank until the flange seats against the front of the socket. This provides a stiff, repeatable connection more than BT shank.

#### High-precision Machining

By a combination of axial clamping forces and taper-shank interference, positiong repeatability improves highr than BT shank, enabling highprecision machining.

#### High Speed Machining

There is no subduction in the high-speed machining because all from holder to clamp unit are in shymmetrical shape.





### **SKM Tool line up**

#### **MICRON CHUCK**



SKM63XMZ-HPC03H-90Y-D SKM63XMZ-HPC04H-90Y-D SKM63XMZ-HPC06H-90Y-D SKM63XMZ-HPC08H-90Y-D SKM63XMZ-HPC10H-90Y-D SKM63XMZ-HPC12H-90Y-D SKM63XMZ-HPC20 -90Y-D SKM63XMZ-HPC25 -105Y-D SKM63XMZ-HPC32 -105Y-D

#### **COLLET CHUCK**



SKM63XMZ-ER11 -60Y-D	
SKM63XMZ-ER11 -90Y-D	
SKM63XMZ-ER11 -120Y-D	
SKM63XMZ-ER16 -60Y-D	
SKM63XMZ-ER16 -90Y-D	SKM63XMZ-ER32 -60Y-D
SKM63XMZ-ER16-120Y-D	SKM63XMZ-ER32 -90Y-D
SKM63XMZ-ER25 -60Y-D	SKM63XMZ-ER32 -120Y-D
SKM63XMZ-ER25 -90Y-D	SKM63XMZ-ER40 -60Y-D
SKM63XM7-ER25-120Y-D	SKM63XMZ-FR40 -90Y-D

#### END MILL HOLDER



SKM63XMZ-EM16-60Y-D SKM63XMZ-EM20-60Y-D SKM63XMZ-EM25-80Y-D SKM63XMZ-EM32-90Y-D

#### MORSE TAPER HOLDER



SKM63XMZ-MTA3-125Y-D

#### FACE MILL ARBORS



SKM63XMZ-FMA25.4	-45Y-D
SKM63XMZ-FMA31.75	-45Y-D
SKM63XMZ-FMC22	-45Y-D
SKM63XMZ-FMC27	-45Y-D
SKM63XMZ-FMC32	-45Y-D

# SHOWA D-F-C SYSTEM (BBT)

#### Merit with dual face contact system

- Improve preciousness of processing surface and dimension
- Extend life of cutting tools
- Control color change (fretting) on the taper side under heavy duty processingh
- Improve repetition preciousness of ATC
- Stability for Z direction at the time of high-speed precessing
- Impreove of roundness of the boring processing

#### SHOWA BBT TOOL SYSTEM



The Showa BBTTool System offers simultaneous dual contact between the machine spindle face and toolholder flange face, as well as the machine spindle taper and long toolholder taper shank.



#### [Reference value]

SHOWA

**D-F-C Shank** 

(BBT)

Spindle size	Clamping force	AXIAL MOVEMENT AMOUNT			
#40	800kg	20µm			
#50	2,000kg	20µm			

\* The value of the table is for reference only and axial movement amount depends on the clamping mechanism and spindle shape. (The numerical values in the machining center owned by the Company)

\*BIG-PLUS system is Daishowa Seiki licensed products

Standard Shank (Taper Contact Only)

# **OTHER SHANK STYLES**

SHOWA Tool holders are available with most of popular shanks.



### Full range of line up, small to big

SHOWA Tooling System includes many sizes of shanks, from small ones such as S20T, HSKE32, to big ones such as BT50, HSKA100. Small shank holders with integral pull stud are also manufactured to order.



### Shank types and Holder



\* Please refer to our distributor, or to us for details.



#### **High Reliability and Proven Performance**

SUPER DRILL was put on the market by SHOWA TOOL CO. Since that time, it was continuously improved through in-the-field experiences. In responce to customer's demands, NEW SUPER DRILL has been developed to increase its flexibility, employing a modular system. The basic set consists of a head and a shank. And, extension arbors are added for deeper holes. SUPER DRILL's ease-of-use is further enhanced by this modular construction.



### Single Pass, precision boring of 50mm-270mm diameters

No center drilling or pilot hole required. Super Drill's built-in center drill acts as an axis for precision drilling. New Super drill is available in 10 standard head sizes, A1S-55, A2-65, B-80, C-100, D-120, E-150, F-180, G-210, H-240 and I-270, for drilling 50mm to 270mm diameters.



### Specialty of deep hole drilling

Combination of roughing and finishing blades form small chips, providing efficient chip removal. No pecking or dwelling required, even for deep holes.



### Able to drill even in hard metals

New Super Drill cutting blades are manufactured from sintered HSS, providing excellent drilling performance even in hard metals.



### **Reusable blades and center drill**

The cutting edge of New Super Drill consists of a center drill, a roughing (R) blade and a finishing(S) blade. Different diameter of holes can be bored by changing blades within the capacity of each drill holder. The blades and center drill can be resharpened which reduces tool cost.



#### **Re-sharpening fixture**



A pair of roughing and finishing blades, can be resharpened utilizing the resharpening fixture on the surface grinder.

#### Oil ring



Oil ring is used to supply coolant through the drill in rotational applications.

#### T/C Guides(for through hole)



In case of through hole drilling, the drill may vibrate immediately before breaking through, depending on hole diameter, cutting speed and feed rate, and rigidity of the machine spindle. This can result in damage of the cuttingblades. Using T/C guides when boring through holes will minimize vibration and help prevent tool damage.

#### Sharpening the blades



- ①"R" and "S blades are ground to the same height.
- ②Both blades are ground in straight line. making first and second clearance.
- ③Grind the center drill to the point angle of 140° with thinning.





### Assembly

New Super Drill's cutting edge consists of three cutters a roughing (R) blade, a finishing(S) blade and a center drill. This combination of cutters gives outstanding drilling efficiency.

#### Procedure



- ① Insert the center drill in the center of the head.
- ② Clamp the roughing(R) blade in the seat marked with pre. The inside edge of the roughing blade must contact tightly against the side slot of the center drill, to prevent the center drill turning free.
- 3 Clamp the finishing(S) blade in the seat marked S.
- ④ Finaly, tighten the center drill setting screw.

#### **Guide Values for New Super Drill**

Speed (min-1) Feed (mm/rev.)

	DIN	42CrM	o4	CK35-	55			ST											
Material	USA	4140	1			1025		D		W1-1	0	D2		40-50	)			ALUMINUM	
	JIS	SCM440		S35C-55C		S25C SS		SS SK3		SK3 SKD11		1	FC25-40		SUS27				
Dia.		Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed
50-6	0	160-180	0.1	160-180	0.1	190-210	0.1	210-240	0.1	80-90		70-80		140-150	0.15	75-90	0.06	450-500	0.15
60-7	0	140-160	0.15	150-160	0.15	170-190	0.15	190-210	0.18	80-85		55-70		120-140	0.25	60-75	0.12	400-450	0.25
70-8	0	110-140		120-140		155-170		170-190		70-80		50-55	1	100-120		55-70		350-400	]
80-9	0	100-120		110-120		140-155		155-170		60-70	0.08	45-50	0.06	90-100		50-60		300-350	]
90-10	0	90-110	0.1 S	100-110		125-140	0.1	140-155		55-60	0.15	40-50	0.1	80-90	0.15 s	45-50	0.06	300-330	0.15
100-1	10	80-100	0.18	90-100		110-125 0.18	130-140		50-55		35-40	]	70-80	0.35	40-45	0.13	280-300	0.35	
110-1	20	70-90		80-90		100-110	_	120-130	-	45-50		30-35		65-70	_	35-40	250-290 230-250	250-290	
120-1	30	70-80		70-80		90-100		105-120		40-45		30-35		60-65		30-35		230-250	
130-1	40	65-70		65-70		80-90	90-100	35-40		25-30		50-60		25-30		200-230			
140-1	50	50-60		50-60		75-80		80-90		30-35	] [	25-30		40-50		20-30		180-200	
150-1	60	50-60		50-60	70-75		75-85		25-35	25-35	20-25	5	35-45		20-25		170-180		
160-1	70	50-60		50-60	0.06	65-70		70-80	25-30	20-25		35-45		15-25		160-170			
170-1	80	45-50		45-50	0.12	60-65		65-75	0.15	25-30		20-25		35-40		15-25		150-160	
180-1	90	45-50		45-50		60-65		60-70	20-30	20-25	30-40		15-25		140-150				
190-2	00	40-45	0.06	45-50		55-60	0.06	60-65		20-25	0.06	15-20	0.05	30-40	0.10	15-20	0.06	135-140	0.15
200-2	10	40-45	0.15	40-45		55-60	0.16	55-65		20-25	0.15	15-20	0.1	30-35	0.25	10-20	0.12	130-135	0.2
210-2	20	40-45		40-45		50-55		55-60		15-25		15-20		25-35		10-20		120-130	
220-23	30	35-40		40-45		50-55 45-50 45-50	50-60		15-20		15-20		25-35		10-20		115-120		
230-24	40	35-40		35-40			50-55		15-20		15-20		25-30		10-20		110-115		
240-2	50	30-35		35-40			45-55		15-20		15-20		25-30		10-20		105-110		
250-2	60	30-35		30-35		45-50		45-50		15-20		15-20		20-25		10-20		100-110	
260-2	70	30-35		30-35		40-45		40-50		15-20		10-15		20-25		10-15		100-110	

NOTE : Reduce drill speed by 30%  $\sim$  50% in case of quenched and tempered Chromoly, structural steel, etc. depending on their hardness.

### New Super Drill Drilling Data

Nominal	Dia. (mm)	Speed (min <sup>-1</sup> )	Ma Cu Fe	aterial S50 ut.speed 20m ed 0.15	C ı/min i	
Item	. ,		Cut.torque (kN · m)	Cut.power (kW)	Thrust force (kN)	н
A4 50 - 55	50	127	0.17	2.2	4.8	
A1-50~55	55	116	0.20	2.3	5.2	
12 55 - 65	60	106	0.23	2.5	5.6	
AZ-33 -03	65	98	0.26	2.6	6.0	
	70	91	0.30	2.8	6.4	
B-65~80	75	85	0.33	2.9	6.8	
	80	80	0.37	3.1	7.2	
	85	75	0.41	3.2	7.5	
C-80~100	90	71	0.46	3.4	7.9	
0-00 -100	95	67	0.50	3.5	8.3	
	100	64	0.55	3.6	8.6	
	105	61	0.60	3.8	9.0	
D-100~120	110	58	0.64	3.9	9.3	
D-100 - 120	115	55	0.70	4.0	9.7	
	120	53	0.75	4.2	10.0	
	125	51	0.80	4.3	10.4	
	130	49	0.86	4.4	10.7	
E 120- 150	135	47	0.92	4.6	11.1	
E-120° ° 150	140	45	0.97	4.7	11.4	
	145	44	1.03	4.8	11.8	
	150	42	1.10	4.9	12.1	
	155	41	1.16	5.0	12.4	
	160	40	1.22	5.2	12.8	
E 150~190	165	39	1.29	5.3	13.1	
1-150 -160	170	37	1.36	5.4	13.4	N
	175	36	1.43	5.5	13.7	
	180	35	1.50	5.6	14.1	

Nominal	Dia. (mm)	Speed (min <sup>-1</sup> )	Material S50C Cut.speed 20m/min Feed 0.15					
Item			Cut.torque (kN∙m)	Cut.power (kW)	Thrust force (kN)			
	185	34	1.57	5.8	14.4			
	190	34	1.64	5.9	14.7			
	195	33	1.72	6.0	15.1			
G-180~210	200	32	1.79	6.1	15.4			
	205	31	1.87	6.2	15.7			
	210	30	1.95	6.3	16.0			
	215	30	2.03	6.4	16.3			
	220	29	2.11	6.5	16.6			
	225	28	2.19	6.7	17.0			
H-210~240	230	28	2.28	6.8	17.3			
	235	27	2.36	6.9	17.6			
	240	27	2.45	7.0	17.9			
	245	26	2.54	7.1	18.2			
	250	25	2.63	7.2	18.5			
I-240~270	255	25	2.72	7.3	18.8			
1-2-40 - 270	260	24	2.81	7.4	19.1			
	265	24	2.90	7.5	19.4			
	270	24	3.00	7.6	19.7			

NOTE : The above values are not ones measured in actual drilling. It is recommended to use New Super Drill on a machine having 50% or more bigger capacity than these values for efficient drilling.