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Roller Burnishing & Surface Reforming Tool

SUPEROLL





What would you do about following if you want?

to create a superior sliding surface.

to make highly airtight sealing surface.

to make products with improved fatigue strength.

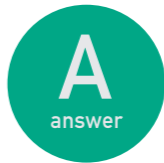
to improve surface roughness.

to bring a hole diameter into tolerance.

to stabilize machining.



Superolls achieve all if you want to.



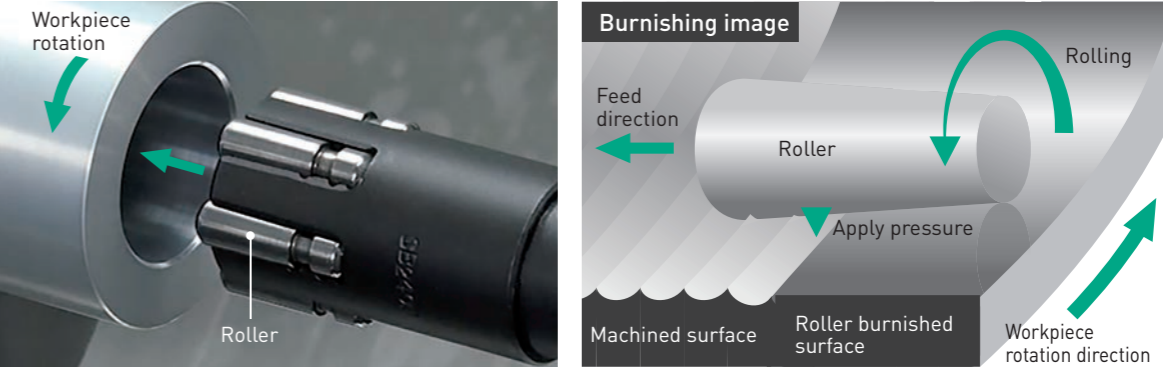
How?

"To press and smooth out surface instead of grinding."

Superolls are roller burnishing tools that create smoother finishes by compressing machined peaks into machined valleys using precision rollers.

Machined surface undergoes plastic deformation as they are compressed with rollers resulting in smooth and seamless finishes. Productivity is improved, precision finishes are created, abrasion resistance is maximized, and part surfaces with improved fatigue strength are achieved.

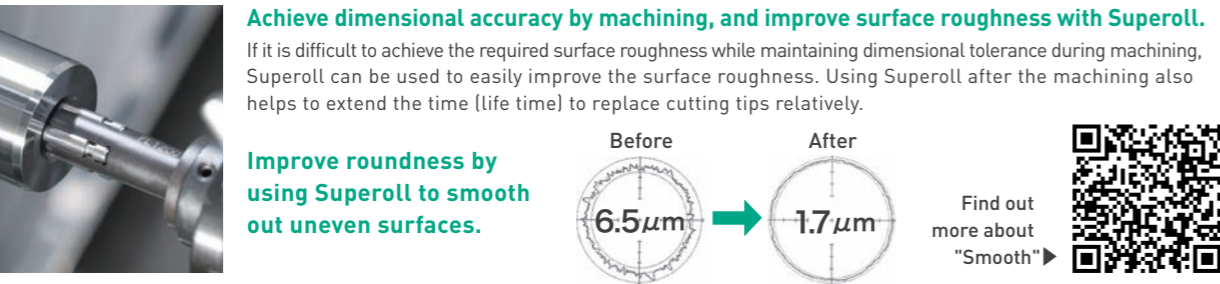
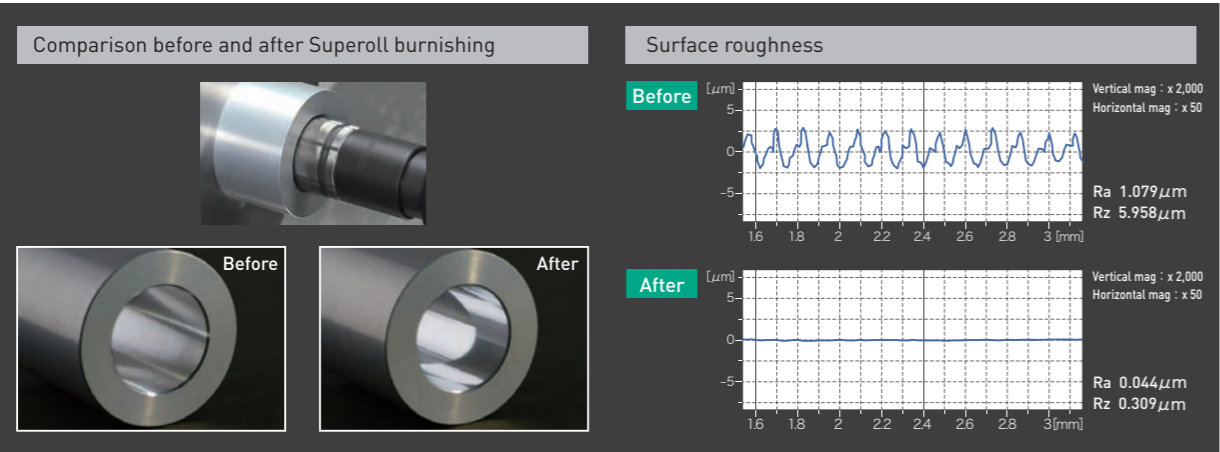
Since parts can be given a precision finish easily and at low cost, Superolls are widely used worldwide for countless applications throughout the automotive industry, within the precision machinery market, chemical industry and parts manufactured for the home appliance markets.



Benefits of burnishing with Superoll.

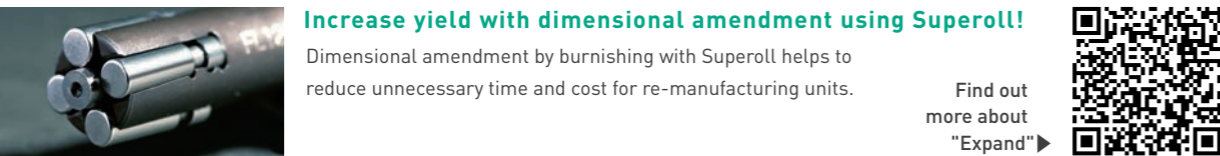
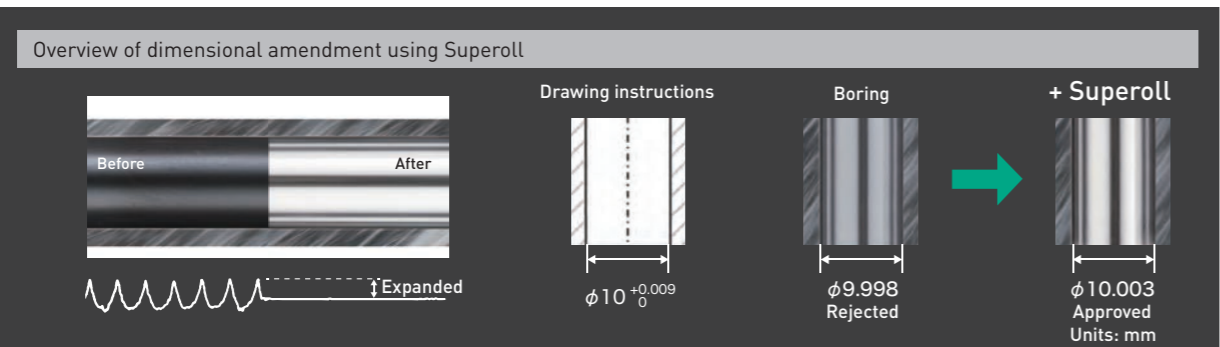
Smooth Improve machined surface roughness by Superoll.

Achieve Rz 0.1 - 0.8 μm finish in one pass.
The finished surface without any sharp projections is suitable for sliding and sealing surfaces.



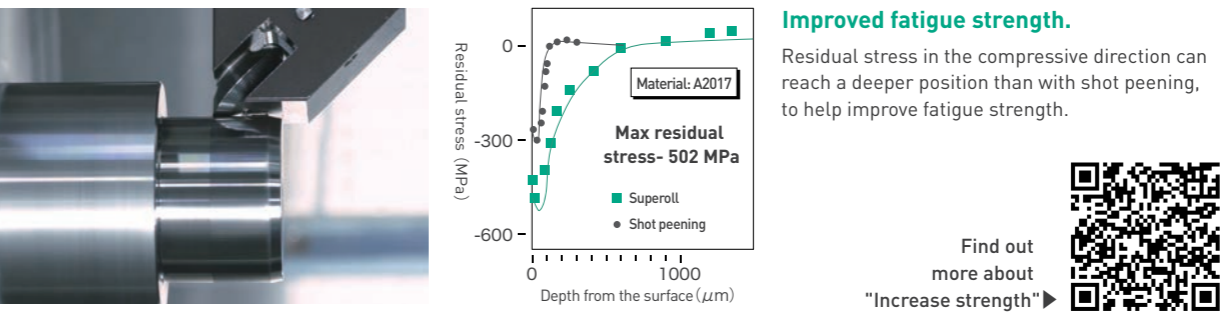
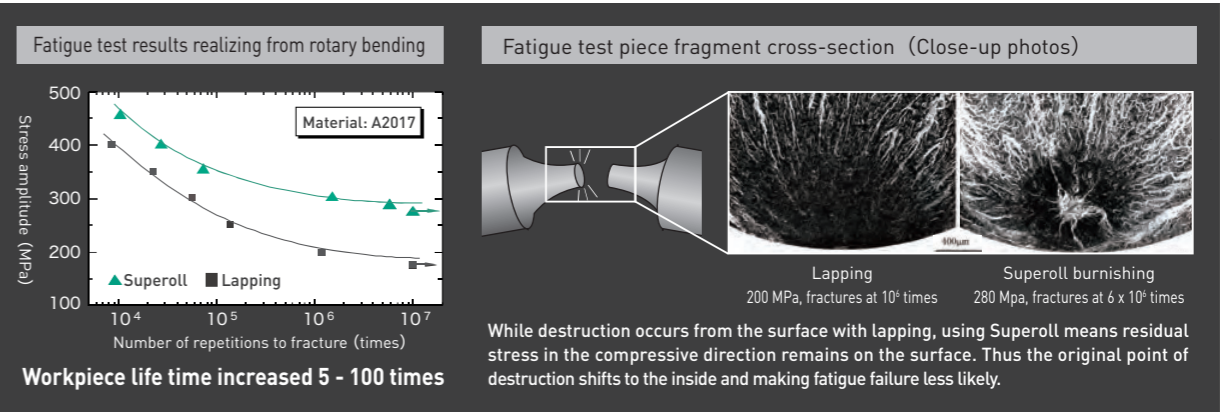
Expand Slight diameter sizing (in microns) without machining.

Smoothing out uneven workpiece surfaces allows dimensional amendment of several μm.



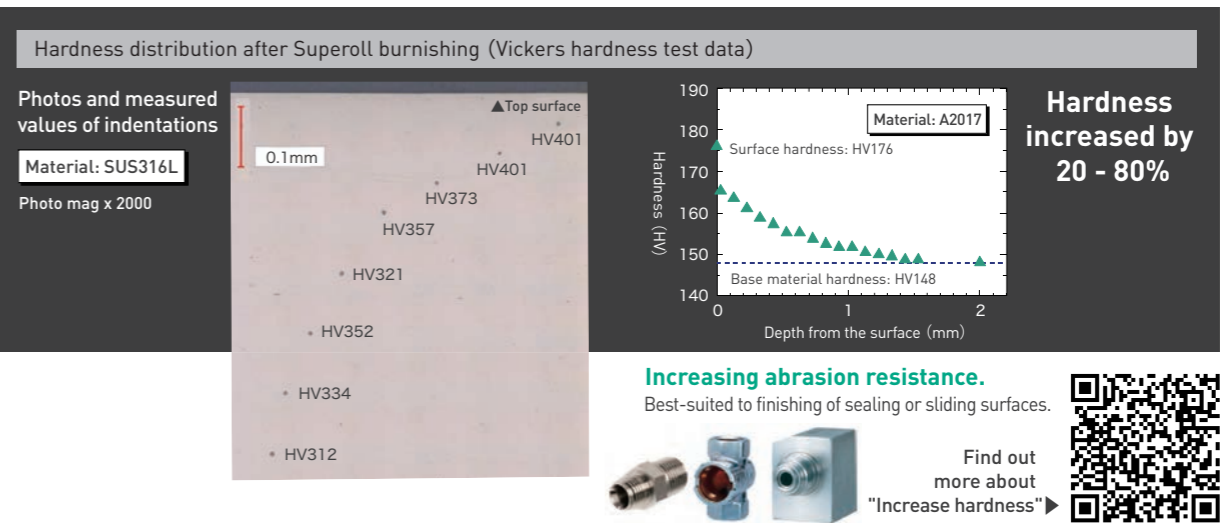
Increase strength Increase endurance life of workpiece with Superoll.

As residual stress in the compressive direction is induced at the surface, fatigue strength is increased by more than 30% using Superoll tools.



Increase hardness Increase metal wear resistance by Superoll.

Uneven metal surface is pressed evenly to harden the areas around the surface, increasing the surface hardness.

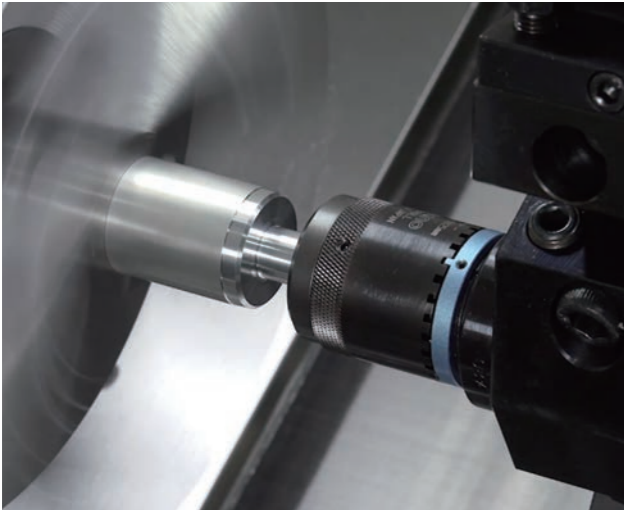


Superroll types

Multi Roller Type

Speedy burnishing with multiple rollers

A type of Superroll for burnishing with multiple rollers. Multiple rollers are arranged to press and smooth a workpiece surface while burnishing at higher feed rates which is suitable for high production applications. In addition to inner surfaces, Multi Roller type Superrolls are also available for outer shaft, spherical surfaces and flat surfaces.

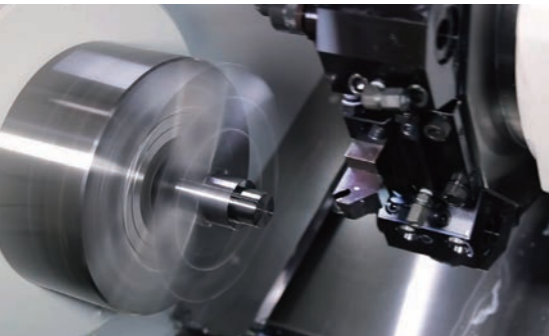


A wide range of Superrolls are available based on Multi Roller Type technology, including types with enhanced versatility, types for forming plateau structure surfaces, types suited to sealing surfaces, and types designed for materials with high hardness.

Single Roller Type

A single roller designed for workpieces of various shapes and sizes

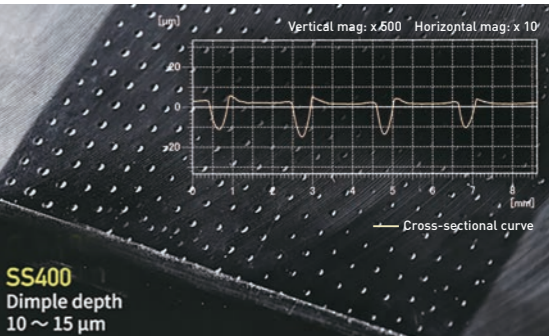
Single Roller type Superroll designed for use with lathes, for burnishing with a single roller. Suited to workpieces of various different shapes and sizes, and ideal for high-mix low-volume production.



Re-forming Type

Forming plateau structure surfaces

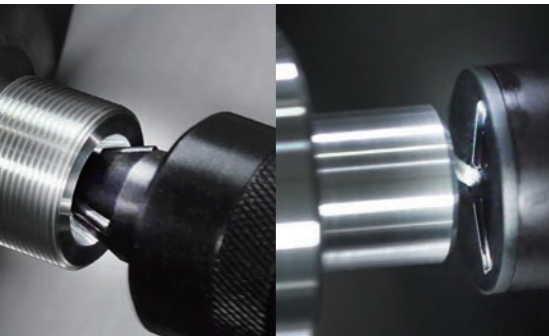
Re-forming type Superroll designed for forming surfaces with excellent sliding characteristics. Presses and smooths any peaks remaining from pre-burnishing, and can optionally leave dimples to serve as oil pots. This gives workpieces greater abrasion resistance and limits seizing.



Compressive Type

Burnishing sealing surfaces with Superroll by each shapes

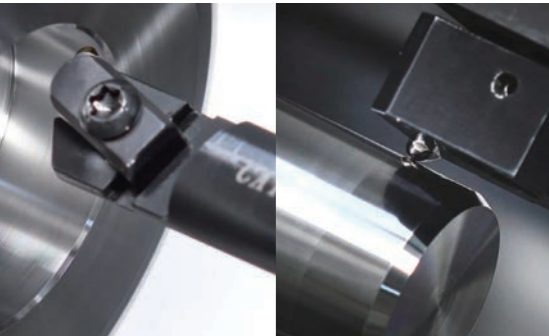
Compressive type Superroll for finishing by applying loads with a spring embedded within Superroll. Ideal for burnishing surfaces that requires sealing properties. Compressive type Superroll is designed and manufactured to suit the shape of workpieces respectively like taper, flat and R surfaces.



Diamond-tool Type

















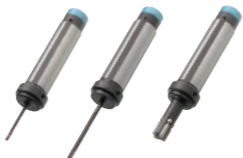



Burnishing materials with high hardness of HRC40 - 60




























Diamond-tool type Superroll for burnishing by pressing diamond tip to workpieces. Ideal for burnishing high-hardness materials of HRC40 - 60 that roller types have difficulty finishing. The diamond tip has a throw-away design that allows for easy replacement.






















Superroll selection























Select suitable Superroll in accordance with your purpose, conditions like workpiece shape and driving units. Please refer to each Superroll introduction pages which are indicated below.

Multi Roller Type					▶P.12		Available driving units				*Depends on Superroll				
Speedy burnishing with multiple rollers															
							Machining center	Engine lathe	Turret lathe	Swiss lathe	Drilling machine	Drilling unit			
Available workpiece shape	Inner surface				Outer surface		Spherical surface	Flat surface							
															
							Through-hole	Blind-hole	Through-hole	Blind-hole	Shaft	Shaft with step	Spherical surface	Flat surface	
Superroll															
	SH		SB		CSL		CSA / SA		SES		SFP				
Page	P.13		P.16				P.17								


Single Roller Type▶P.18						Available driving units				*Depends on Superoll		
A single roller designed for workpieces of various shapes and sizes						 Machining center	 Engine lathe	 Turret lathe	 Swiss lathe	 Drilling machine	 Drilling unit	
Available workpiece shape	Outer / End surface		Multiple surface		Inner surface		Groove surface					
	 Shaft	 Shaft with step	 End surface	 Shaft	 Shaft with step	 End surface	 Through-hole	 Blind-hole	 Outer groove side	 Inner groove side	 Outer groove bottom	 Groove end surface
Superoll												
	SR5A		SR16M		SR5C	SR16C	SR3Z	SR3ZH	SR24MW	CEZF	CEZH	
Page	P.19		P.20		P.19	P.21	P.22		P.23			

Re-forming Type				▶ P.24		Available driving units				*Depends on Superoll	
Forming plateau structure surfaces						<div><div> Machining center</div><div> Engine lathe</div><div> Turret lathe</div><div> Swiss lathe</div><div> Drilling machine</div><div> Drilling unit</div></div>					
Available workpiece shape	Forming plateau structure surfaces		Forming micro dimples								
	<div> Through-hole</div>	<div> Blind-hole</div>	<div> Through-hole</div>	<div> Flat surface</div>	<div> Shaft</div>	<div> Shaft with step</div>					
Superoll											
	SH-MAC	SB-MAC	BPH	BPP	BPSR						
Page	P.25		P.26								

Compressive Type▶P.27					Available driving units				*Depends on Superroll					
Burnishing sealing surfaces with Superroll by each shapes														
Available workpiece shape	Inner taper surface		Flat surface		Convex R surface		Outer taper surface							
														
Superroll														
	ST	CST	SF	CSF	FD	CFD	SE	CSE						
Page	P.28	P.30	P.28	P.30	P.29	P.30	P.29	P.30						

Diamond-tool Type						▶P.31		Available driving units					
Burnishing materials with high hardness of HRC40 - 60													
Available workpiece shape	Outer surface		End surface	Inner surface		Multiple surface							
													
	Shaft	Shaft with step	End surface	Through-hole	Blind-hole	Shaft	Shaft with step	Taper shaft	R surface 1	R surface 2	End surface	Counterbore surface	
Superroll													
	CEO	CEF	CEH	CEO-AJ									
Page	P.32			P.33									

This App helps you to select the appropriate Superroll easily according to the workpiece dimension and material, etc.



SUPEROLL

Interactive Catalog
APP for Smartphones and Tablets
Available for [iOS](#) [Android](#) ▶P.34

When you input the workpiece dimension and material, suitable Superroll will be suggested. In case that various types of Superroll are suggested, please select the suitable one for your purpose, based on the ranking of the compared features. Then, model, outside drawing and burnishing conditions according to your driving unit are shown after inputting shank size. FAQ, technical information and our new product information are updated.

Multi Roller Type

Speedy burnishing with multiple rollers

A type of Superoll for burnishing with multiple rollers. Multiple rollers are arranged to press and smooth a workpiece surface while burnishing at higher feed rates which is suitable for high production applications. In addition to inner surfaces, Multi Roller type Superoll are also available for outer shaft, spherical surfaces and flat surfaces.

Inner surface



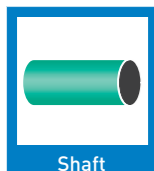
Through-hole

SH
CSL

Blind-hole

SB
CSL

Outer surface



Shaft

CSA/SA



Shaft with step

Spherical surface



Spherical surface

SES

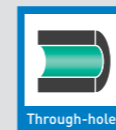
Flat surface



Flat surface

SFP

Multi Roller Type Speedy burnishing with multiple rollers



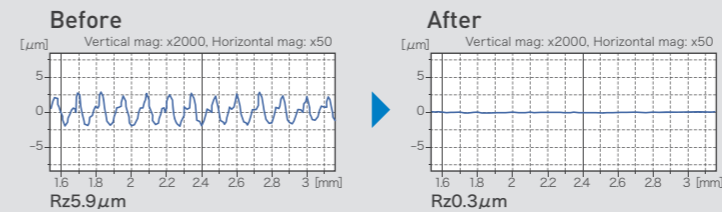
Through-hole

Superoll SH

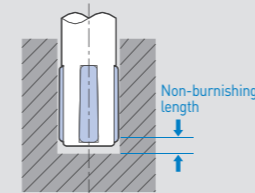
Basic type Superoll for inner surface burnishing (For through-hole). Equipped with tool diameter adjustment in increments of 0.0025mm.

Hole size Standard: $\phi 4.5 - \phi 200\text{mm}$
Special : $\phi 3.0\text{mm}$ or more

Burnishing data

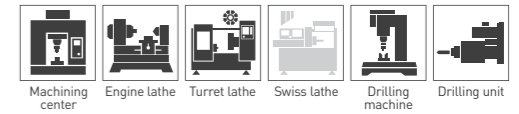


Non-burnishing length



* In case of through-hole

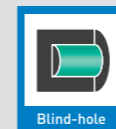
Hole diameter (mm)	Non-burnishing length (mm)
$\phi 4.5 - \phi 5.7$	2.0
$\phi 6 - \phi 7.6$	2.1
$\phi 8 - \phi 14.5$	2.5
$\phi 15 - \phi 34$	2.8



Burnishing video



Burnishing conditions table



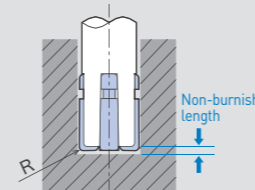
Blind-hole

Superoll SB

Basic type Superoll for inner surface burnishing (For blind-hole). Equipped with tool diameter adjustment in increments of 0.0025mm.

Hole size Standard: $\phi 8.5 - \phi 200\text{mm}$
Special : $\phi 6.0\text{mm}$ or more

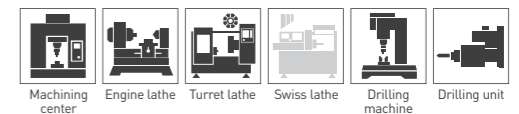
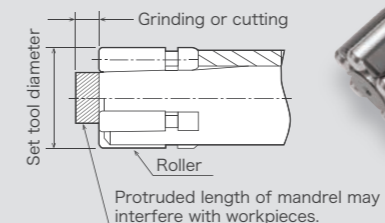
Non-burnishing length



*Non-burnishing length can be reduced by using R0.3 type rollers.

Roller	Hole size (mm)	Non-burnishing length (mm)
Standard	$\phi 8 - \phi 14.5$	1.5
	$\phi 15 - \phi 34$	1.8
R0.3	All size	0.8

Depending on a set tool diameter, a mandrel protruded length from a rollers tip may interfere with a bottom surface of workpieces. In that case, cut or grind the protruded length of mandrel by grinding or other means before using.



Burnishing video

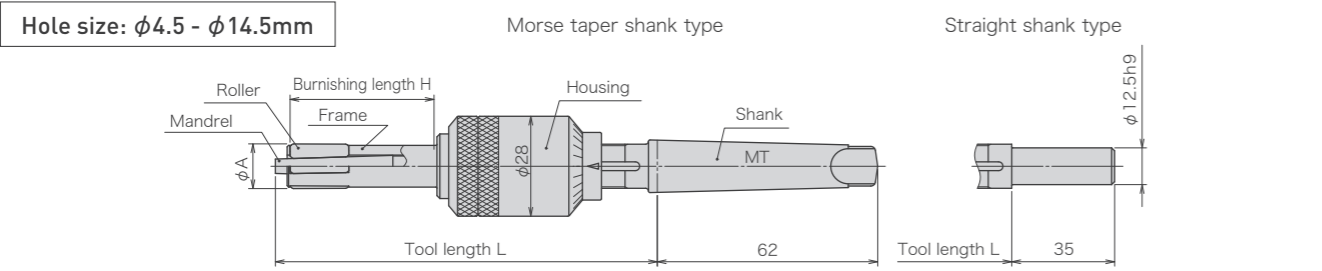


Burnishing conditions table

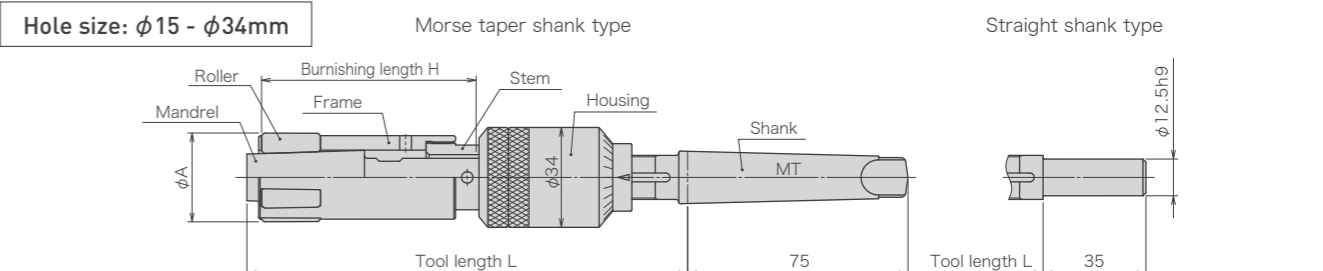


Multi Roller Type Speedy burnishing with multiple rollers

Superoll SH & SB selection chart (For hole size φ4.5 - φ34mm)



Tool model		Tool diameter adjustment range A	Burnishing length H	Tool length L		Part No.						
Through-hole	Blind-hole	Min. - Max.	mm	Morse taper shank type	Straight shank type	Housing	Roller			Mandrel	Shank	
						—	Through-hole	Blind-hole	Q'ty		Morse taper	Straight
SH450		4.45 - 4.80	Standard 50	Standard 118	Standard 115	HA1	R001		4	M001	S01 (MT1)	S01R
SH475		4.70 - 5.05					R001			M002		
SH500		4.95 - 5.30					R002			M002		
SH525		5.20 - 5.55					R002			M003		
SH550		5.45 - 5.80					R003			M002		
SH575		5.70 - 6.05					R003			M003		
SH600 (L)		5.95 - 6.45	Standard 50	Standard 118	Standard 115		R004			M004 (L)		
SH640 (L)		6.35 - 6.85					R004			M005 (L)		
SH680 (L)		6.75 - 7.25					R004			M006 (L)		
SH720 (L)		7.15 - 7.65					R005			M005 (L)		
SH760 (L)		7.55 - 8.05					R005			M006 (L)		
SH800 (L)		SB800 (L)					7.95 - 8.55	Standard 50	Standard 118	Standard 115	R006	B006
SH850 (L)	SB850 (L)	8.45 - 9.05	R006	B006	M008 (L)							
SH900 (L)	SB900 (L)	8.95 - 9.55	R007	B007	M007 (L)							
SH950 (L)	SB950 (L)	9.45 - 10.05	R007	B007	M008 (L)							
SH1000 (L)	SB1000 (L)	9.95 - 10.55	R007	B007	M009 (L)							
SH1050 (L)	SB1050 (L)	10.45 - 11.05	R008	B008	M008 (L)							
SH1100 (L)	SB1100 (L)	10.95 - 11.55	R008	B008	M009 (L)							
SH1150 (L)	SB1150 (L)	11.45 - 12.05	R008	B008	M010 (L)							
SH1200 (L)	SB1200 (L)	11.95 - 12.55	R009	B009	M009 (L)							
SH1250 (L)	SB1250 (L)	12.45 - 13.05	R009	B009	M010 (L)							
SH1300 (L)	SB1300 (L)	12.95 - 13.55	R009	B009	M011 (L)							
SH1350 (L)	SB1350 (L)	13.45 - 14.05	R010	B010	M010 (L)							
SH1400 (L)	SB1400 (L)	13.95 - 14.55	R010	B010	M011 (L)							
SH1450 (L)	SB1450 (L)	14.45 - 15.05			R010		B010	M012 (L)				



Tool model		Tool diameter adjustment range A	Burnishing length H	Tool length L		Part No.							
				Morse taper shank type	Straight shank type	Housing	Roller			Mandrel	Stem	Shank	
Through-hole	Blind-hole	Min. - Max.	mm	mm	mm	—	Through-hole	Blind-hole	Q'ty				
SH1500 (L)	SB1500 (L)	14.9 - 16.1	Standard 50	Standard 130	Standard 127	HA2	R011	B011	4	M013 (L)	E1 (L)	S02 (MT2)	S02R
SH1600 (L)	SB1600 (L)	15.9 - 17.1					R011	B011		M014 (L)	E2 (L)		
SH1700 (L)	SB1700 (L)	16.9 - 18.1					R011	B011		M015 (L)	E3 (L)		
SH1800 (L)	SB1800 (L)	17.9 - 19.1					R012	B012		M014 (L)	E2 (L)		
SH1900 (L)	SB1900 (L)	18.9 - 20.1					R012	B012		M015 (L)	E3 (L)		
SH2000 (L)	SB2000 (L)	19.9 - 21.1					R011	B011	M016 (L)	E4 (L)			
SH2100 (L)	SB2100 (L)	20.9 - 22.1	Long 150	Long 230	Long 227		R011	B011	M017 (L)	E5 (L)			
SH2200 (L)	SB2200 (L)	21.9 - 23.1					R011	B011	M018 (L)	E6 (L)			
SH2300 (L)	SB2300 (L)	22.9 - 24.1					R012	B012	M017 (L)	E5 (L)			
SH2400 (L)	SB2400 (L)	23.9 - 25.1					R012	B012	M018 (L)	E6 (L)			
SH2500 (L)	SB2500 (L)	24.9 - 26.1					R012	B012	M019 (L)	E7 (L)			
SH2600 (L)	SB2600 (L)	25.9 - 27.1					R012	B012	M020 (L)	E7 (L)			
SH2700 (L)	SB2700 (L)	26.9 - 28.1	Standard 70	Standard 150	Standard 147		R012	B012	6	M021 (L)	E7 (L)		
SH2800 (L)	SB2800 (L)	27.9 - 29.1					R012	B012		M022 (L)	E7 (L)		
SH2900 (L)	SB2900 (L)	28.9 - 30.1					R012	B012		M023 (L)	E8 (L)		
SH3000 (L)	SB3000 (L)	29.9 - 31.1					R013	B013		M022 (L)	E8 (L)		
SH3100 (L)	SB3100 (L)	30.9 - 32.1					R013	B013		M023 (L)	E8 (L)		
SH3200 (L)	SB3200 (L)	31.9 - 33.1					R013	B013		M024 (L)	E8 (L)		
SH3300 (L)	SB3300 (L)	32.9 - 34.1	Long 150	Long 230	Long 227		R013	B013	M025 (L)	E8 (L)			
SH3400 (L)	SB3400 (L)	33.9 - 35.1					R013	B013	M026 (L)	E8 (L)			

*About the tool weight. (Reference only)
The weight of all tools in the chart of page 14 – 15 is less than 1kg.
Please check the allowable tool weight for your driving machine before using the tool.
Please contact us if a specific tool weight is required.

About Burnishing length H

Select a Burnishing length H that retains 1 mm or more clearance between Superoll and workpiece. Burnishing lengths H other than standard or long specifications are also available as special types. Please refer to the table below and contact your nearest sales office by using the catalog inquiry sheet, or use the inquiry form on our website.

Tool Model		Recommended special burnishing length (mm)							
SH/SB	450- 575	70	90	120	150	180	210		
	600- 760			120	150	180	210	240	
	800-1450			120	150	180	210	240	
	1500-2400				150	180	210	240	
	2500-3400				150	180	210	240	270

Precaution with R0.3 type rollers for Superoll SB

When using R0.3 type rollers that reduce the non-burnishing length of blind-holes, the hole entrance must be chamfered to prevent interference between the roller tip and workpiece when inserting Superoll SB.
Please refer to the chamfer size chart on the right for details.

Tool model		Chamfer Size
SB	800-1450	C0.5 or more
	1500-3400	C1 or more

Specifying tool model

SH ○○○○ L (S○○○) E.g.: SH720(S01)

SH: For through-hole
SB: For blind-hole

L is added for long burnishing length.

Tool model = Hole size x 100

Select from either Morse taper or Straight shank type.
Shanks other than the sizes listed in the selection chart above are also available as special types.
Please refer to the table below and contact your nearest sales office by using the catalog inquiry sheet, or use the inquiry form on our website.

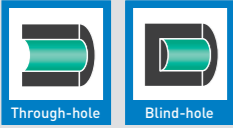
Tool Model	Recommended special shank sizes		
SH/SB	450-1450	φ10-60L	φ16-70L
	1500-3400	φ16-70L	φ20-70L

About tool selections

- Select Tool model within the Tool diameter adjustment range A to suit the hole size.
- For hole sizes ø35 - ø200mm, please scan the two-dimensional bar code on the right and refer to the Superoll SH & SB selection chart.
- For request a special dimensions not included in the Superoll SH & SB selection chart, please contact your nearest sales office by using the catalog inquiry sheet, or use the inquiry form on our website.



Multi Roller Type Speedy burnishing with multiple rollers

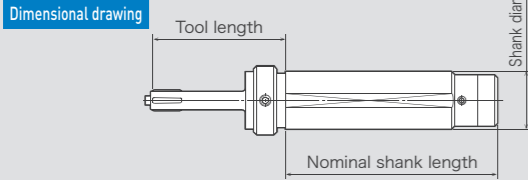


Superroll CSL

Superroll CSL can be installed on Swiss lathe as the tool diameter adjustment mechanism is downsized from Superroll SH/SB. Shank is standardized based on the typical CNC lathe. While burnishing, using with normal rotation and switch to reverse rotation when retracting.

Hole size $\phi 3 - \phi 14.9\text{mm}$

Burnishing length Standard: 30mm
Long : 50mm



Overview dimension

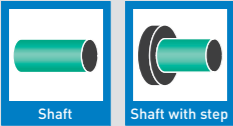
Tool length (mm)	Standard	46				
	Long	66				
Shank diameter (mm)		$\phi 19.05$	$\phi 20$	$\phi 22$	$\phi 25$	$\phi 25.4$
Shank length (mm)	Nominal 75					
	Nominal 115					



Burnishing video



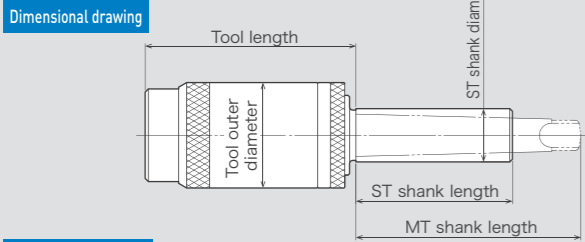
Selection chart / Burnishing conditions table



Superroll CSA/SA

CSA/SA type Superroll is for shaft outside diameters burnishing. Superroll CSA is available for workpiece size $\phi 3 - \phi 14.9\text{mm}$ and Superroll SA is for $\phi 15 - \phi 64\text{mm}$.

Workpiece size CSA: $\phi 3 - \phi 14.9\text{mm}$
SA : $\phi 15 - \phi 64\text{mm}$



Dimensional table

	Workpiece size (mm)	Tool outer diameter (mm)	Tool length (mm)	Shank (mm)				
				$\phi 19.05$	$\phi 20$	$\phi 22$	$\phi 25$	$\phi 25.4$
CSA	$\phi 3 - \phi 7$	$\phi 28$	48	ST shank length 72				
	$\phi 7.1 - \phi 11$	$\phi 38$						
	$\phi 11.1 - \phi 14.9$	$\phi 41$		— ST shank length 72				
SA	$\phi 15 - \phi 24$	$\phi 66$	132	MT3 (Shank length 98)				
	$\phi 25 - \phi 44$	$\phi 98$	147	MT4 (Shank length 123)				
	$\phi 45 - \phi 64$	$\phi 128$	157					



Burnishing video



Selection chart / Burnishing conditions table

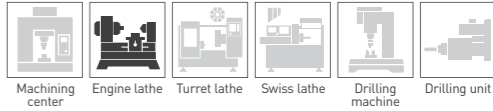
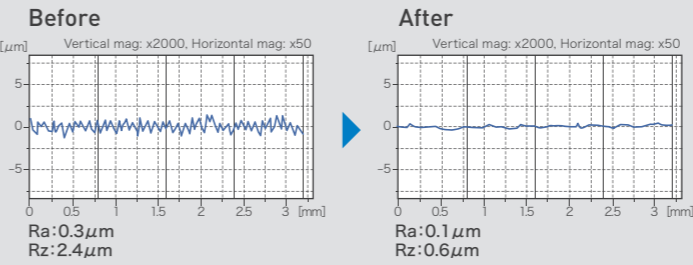


Superroll SES

Superroll SES is for spherical workpiece burnishing like ball studs and tie rods. Combined machine or motor unit is required since both workpiece and Superroll SES should rotate while burnishing.

Spherical size S $\phi 10 - S \phi 30\text{mm}$

Burnishing data

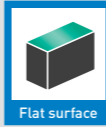


Special tool rest is required due to rotating both workpiece and Superroll SES



Attachment example to a driving unit. Motor attachment type

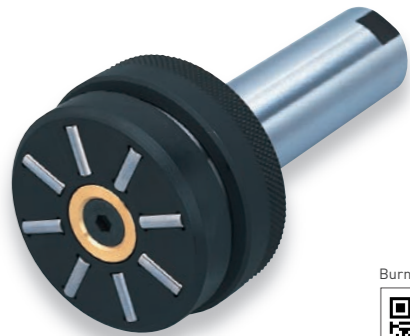
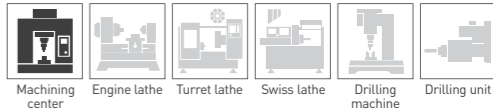
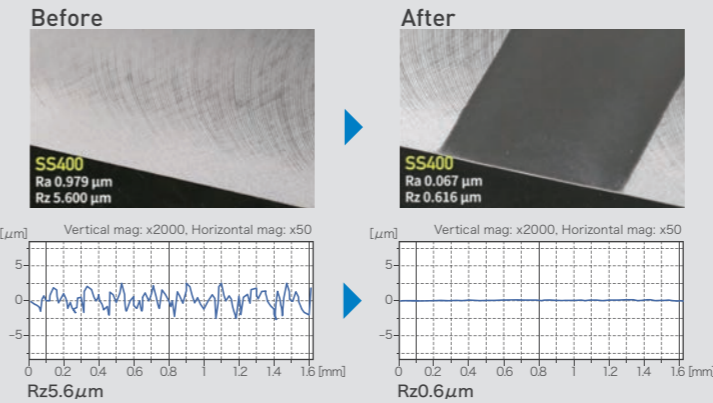
Burnishing video



Superroll SFP

Superroll SFP is suitable for extensive range of flat surface with similar procedure like a face milling. (Cross milling). Thus, unlimited burnishing range for width, Superroll SFP is suitable for mating or sealing surface.

Burnishing data



SFP40-S25 type



Burnishing video



Selection chart / Burnishing conditions table



Improve unstable finished surface due to the variation of pre-hole size.



Superroll MAC

With automatic tool diameter adjustment feature, tool diameter automatically tracks the pre-hole size and achieves stable finished surface.



For more detail, please refer to page 25.

Single Roller Type

A single roller designed for workpieces of various shapes and sizes

Single Roller type Superoll designed for use with lathes, for burnishing with a single roller. Suited for parts of various different shapes and sizes, and ideal for high-mix low-volume productions.

Outer/End surface



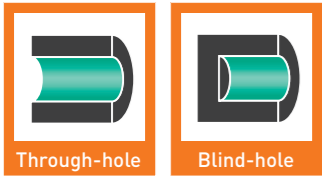
SR5A
SR16M

Multiple surface



SR16M

Inner surface



SR5C
SR16C

Groove surface



SR3Z SR3ZH SR24MW CEZF CEZH

Single Roller Type

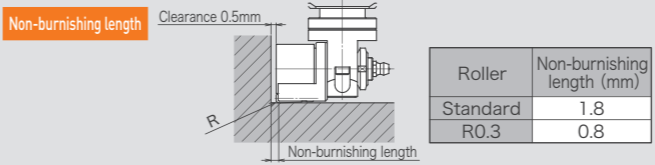
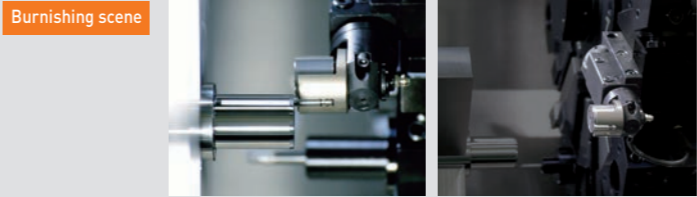
A single roller designed for workpieces of various shapes and sizes



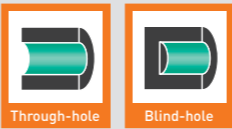
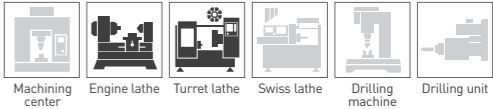
Superoll SR5A

Superoll SR5A is suitable for not only outer surface (Shaft) finishing, but end surface.

Available burnishing range Workpiece size: $\phi 10\text{mm}$ or more



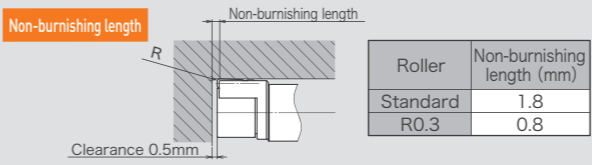
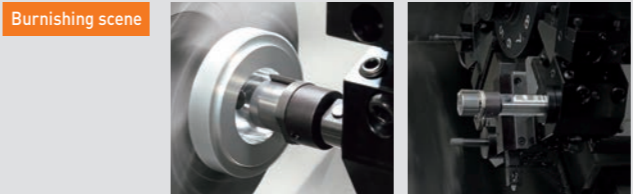
*Non-burnishing length can be reduced by using R0.3 type rollers.



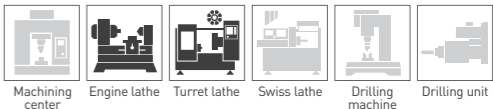
Superoll SR5C

Superoll SR5C is for inner surface burnishing. It's available for different size of workpieces with just only Superoll SR5C.

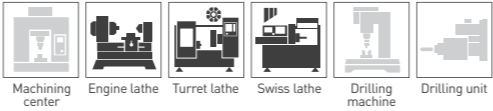
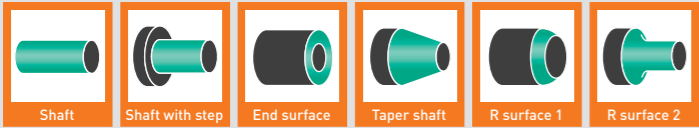
Available burnishing range Hole size: $\phi 36\text{mm}$ or more
Max burnishing length: 100mm



*Non-burnishing length can be reduced by using R0.3 type roller.



Single Roller Type A single roller designed for workpieces of various shapes and sizes

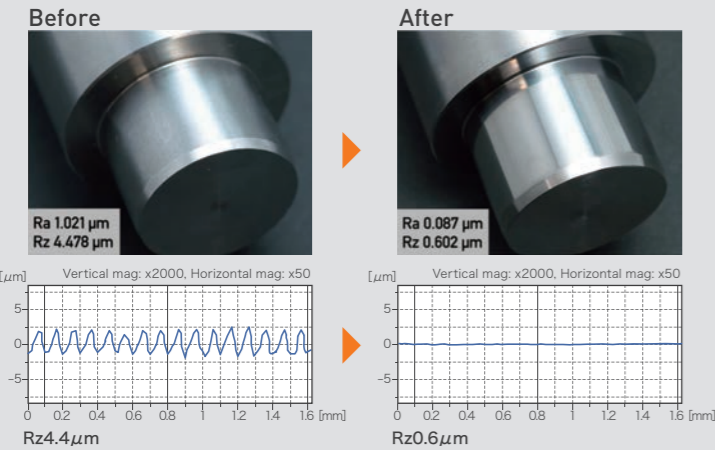


Superoll SR16M

Superoll SR16M is compact Superoll which can be attached to Swiss lathe. Without changing a tool posture, Superoll SR16M can burnish various shapes of outer and edge surface.

Available burnishing range No limitation (Except for small size cantilever)

Burnishing data




Roller tip R size

Select Roller tip R size in accordance with workpiece or requested burnishing conditions.

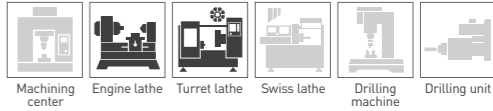
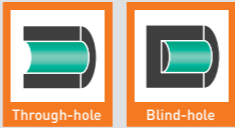
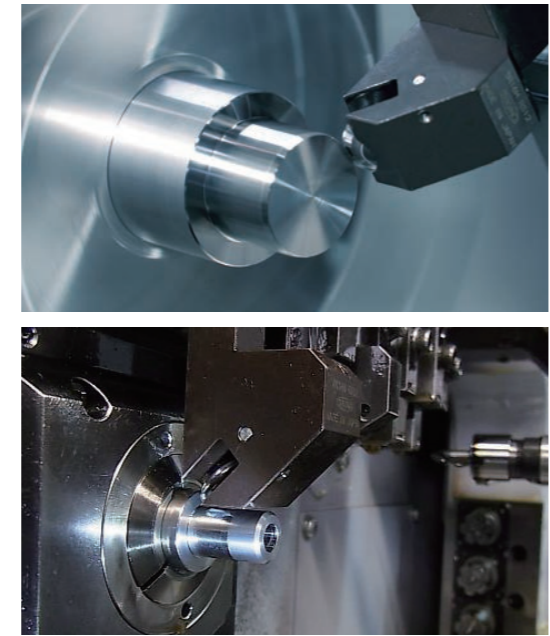
Standard roller tip R size				
	R0.2	R1.5	R3.0	
Roller tip R size				
R0.2	Available		Non available	None
R1.5	Available			1.5
R3.0	Available			3.0

Shank



Standard shank A size (mm)					
10	12	16	20	25	25.4

*For more detail about a dimension of shank, please scan the two-dimensional bar code on the right and refer to Dimensional drawing.
*For request about special Shank size, contact your nearest sales office by using the catalog inquiry sheet, or use the inquiry form on our website.



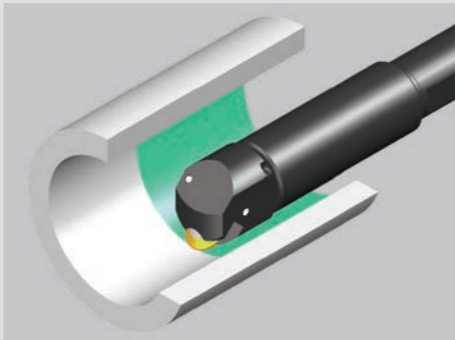
Superoll SR16C

Superoll SR16C is a versatile inner burnishing version tool of Superoll SR16M. For shank specification and Max burnishing length, contact your nearest sales office by using the catalog inquiry sheet, or use the inquiry form on our website.

Available burnishing range Hole size: $\phi 35\text{mm}$ or more
*Vary depending on the burnishing length.

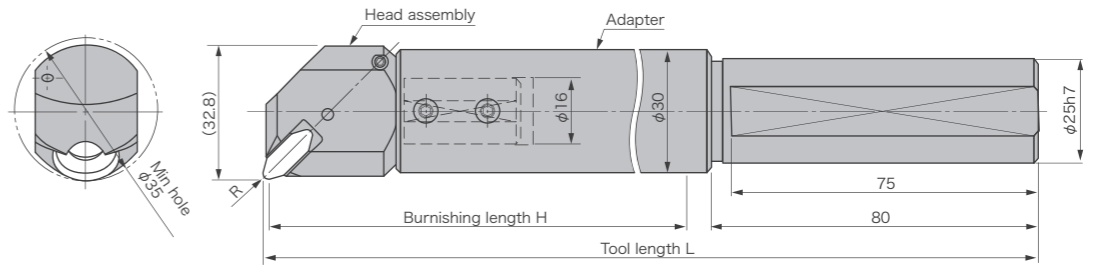
Roller tip R The same as SR16M
*For more detail, refer to page 20.

Burnishing image

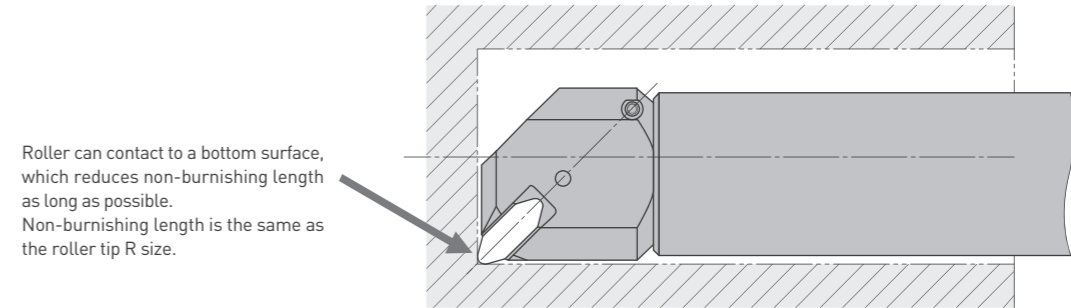


Specification example

Burnishing length 150mm – 200mm



*For dimensional drawing above, Burnishing length H can be available up to 200mm in units of 50mm. Tool length L = Burnishing length H + 90mm.
*In case Burnishing length H is ① 100mm or shorter or ② 200mm or longer, please scan the two-dimensional bar code above and refer to Selection chart.



Single Roller Type A single roller designed for workpieces of various shapes and sizes

Superroll SR3Z

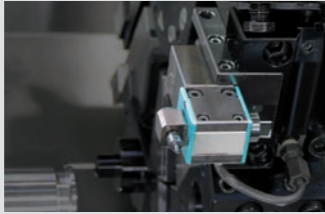
Superroll SR3Z is suitable for finishing groove side surface for attaching O-ring or seal ring.

Available groove range

Item	Groove range (mm)	
	Standard	Special
Groove width	3.6 or more	2.2 or more
Groove depth	5.5 or less	*

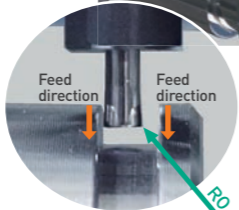
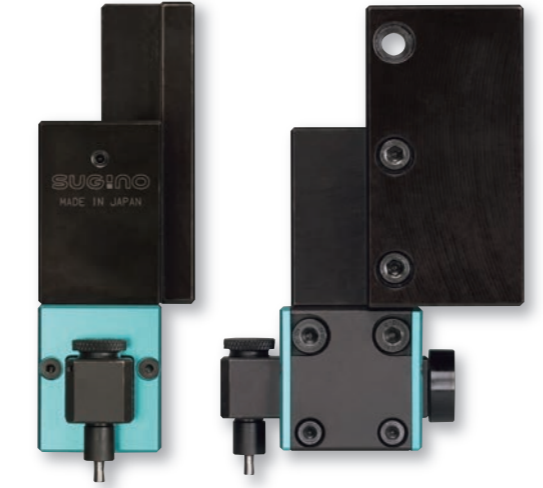
*Special groove depth can be designed upon customer's request.

SR3Z attachment scene



Burnishing data

Material	Roughness (μm)	
	Before	After
SCM440	 Ra1.0 Rz4.4	 Ra0.1 Rz0.7
SUS303	 Ra0.4 Rz2.3	 Ra0.1 Rz0.6
A5056	 Ra1.2 Rz4.5	 Ra0.1 Rz0.8



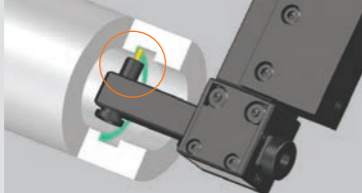
*Burnishing bottom surface is not available.

Superroll SR3ZH

Superroll SR3ZH is suitable for finishing inner groove side surface.

Available groove range
Groove width: 3.6mm or more
Groove depth: 5mm or less
Hole size: φ40mm or more

Burnishing image

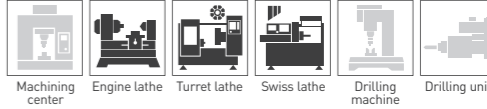
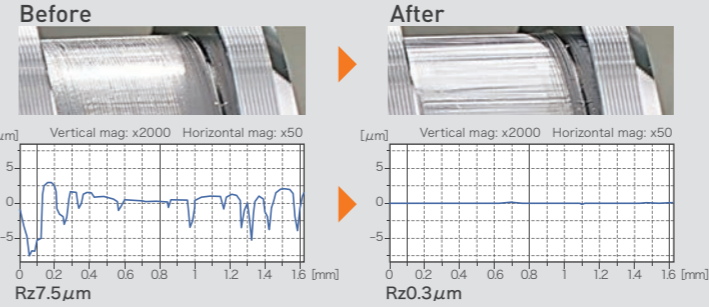


Superroll SR24MW

Superroll SR24MW is for outer groove bottom burnishing. It has so compact body that can be attached to Swiss lathe.

Available groove range
Groove width: 1.4mm or more
Groove depth: 5mm or less

Burnishing data

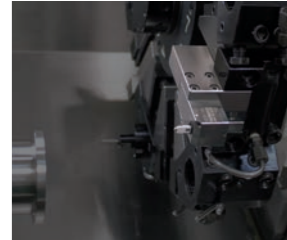
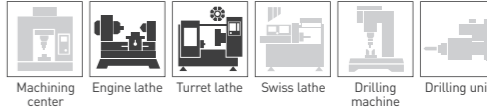
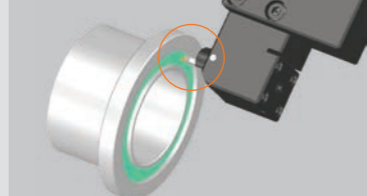
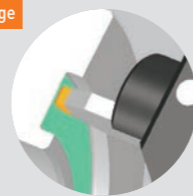


Superroll CEZF

Superroll CEZF is for groove end surface burnishing. The shape of diamond tip which can avoid the interference with groove curvature reduces non-burnishing area.

Available groove range
Groove width: 1.4mm or more
Groove depth: It can be designed upon customer's request.
Groove size: φ40mm or more (In case the groove depth 2mm or less)

Burnishing image

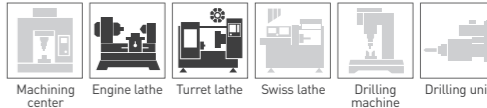
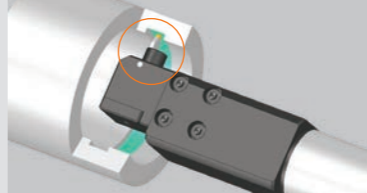


Superroll CEZH

Superroll CEZH is for inner groove bottom burnishing and also suitable for groove bottom located at back side.

Available groove range
Groove width: 1.4mm or more
Groove depth: It can be designed upon customer's request.
Hole size: φ68mm or more

Burnishing image



Re-forming Type

Forming plateau structure surfaces

Re-forming type Superroll designed for forming surfaces with excellent sliding characteristics. Presses and smooths any peaks remaining from pre-burnishing, and can optionally leave dimples to serve as oil pots. This gives workpieces greater abrasion resistance and limits seizing.

Forming plateau structure surfaces



Through-hole

SH-MAC



Blind-hole

SB-MAC

Forming micro dimple surface



Through-hole

BPH



Flat surface

BPP



Shaft

BPSR

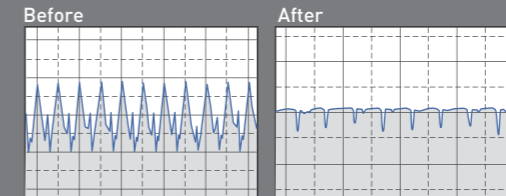
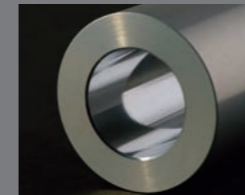


Shaft with step

Re-forming Type Forming plateau structure surfaces

Superroll MAC

Forming plateau structure surfaces in one pass after machining.



Protruding peaks that cause sliding resistance

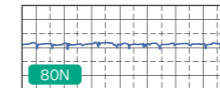
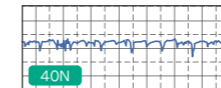
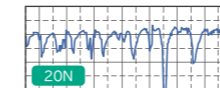
$Rpk \ 3.208\mu m \Rightarrow 0.050\mu m$

Protruding dimples that form oil pots.

$Rvk \ 1.311\mu m \Rightarrow 1.295\mu m$

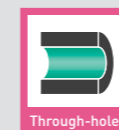
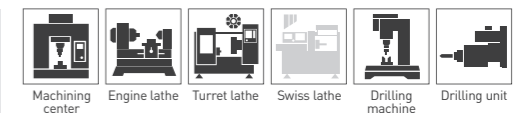
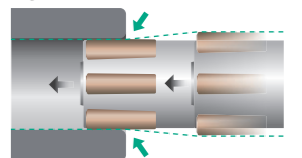
Working pressure adjustment function

Working pressure can be adjusted arbitrarily, which makes dimples depth of finished surface adjustable.



Automatic tool diameter adjustment feature

Tool diameter tracks to the reduction direction with in a range of up to 0.2mm from a setting tool diameter.



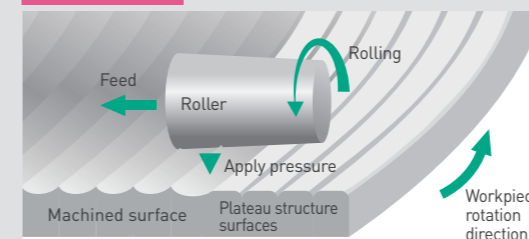
Through-hole

SH-MAC

SH-MAC is for inner surface burnishing. (For through-hole)

Hole size $\phi 4.5 - \phi 44mm$

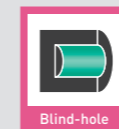
Burnishing image



Burnishing video



Selection chart / Burnishing conditions table



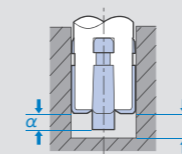
Blind-hole

SB-MAC

SB-MAC is for inner surface burnishing. (For blind-hole)

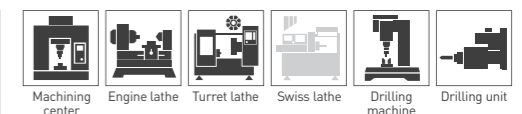
Hole size $\phi 8 - \phi 44mm$

Non-burnishing length



Roller specification	Hole diameter (mm)	Non-burnishing length (mm)
Standard	$\phi 8 - \phi 14.5$	$1.5 + \alpha$
	$\phi 15 - \phi 44$	$1.8 + \alpha$
R0.3	All sizes	$0.8 + \alpha$

*Depending on the setting tool diameter, the mandrel protruded length from the roller tip may interfere with the bottom surface of workpieces. In that case, cut or grind the protruded length of the mandrel by grinding or other means before using. For more details, please scan the two-dimensional bar code on the right and refer to Selection chart & Burnishing conditions.



Burnishing video



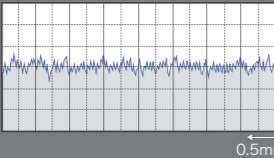
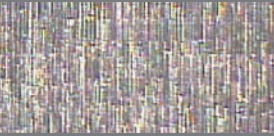
Selection chart / Burnishing conditions table



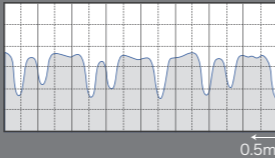

Superoll BP (Micro dimples forming Superoll)

Forming micro dimples in one pass.

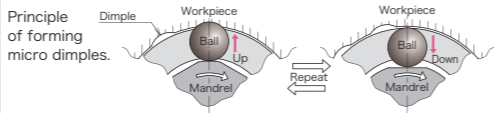
Before



After



Superoll BP can form micro dimples (dent) of a few μm depth on a metal surface. It allows to form micro dimples at high speed by giving predetermined rotation and feed, and projecting balls embedded in it regularly.





BPH

BPH is a micro dimples forming Superoll for inner surface and the design is based on Superoll SH. BPH can form specific pattern of micro dimples at inner surface in one pass.

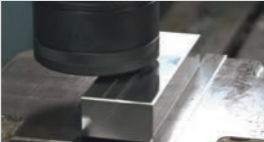
Hole size Steel: $\phi 5\text{mm}$ or more
Aluminum·Copper: $\phi 4\text{mm}$ or more



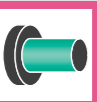
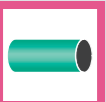
BPP

BPP is a micro dimples forming Superoll by attaching a machining center or milling machine. BPP can form dot pattern micro dimples on flat surface, and gain the same effect as hand scraping.

Available burnishing range No limitation
(If there is any steps, non-burnishing area will be arisen at the boundary.)



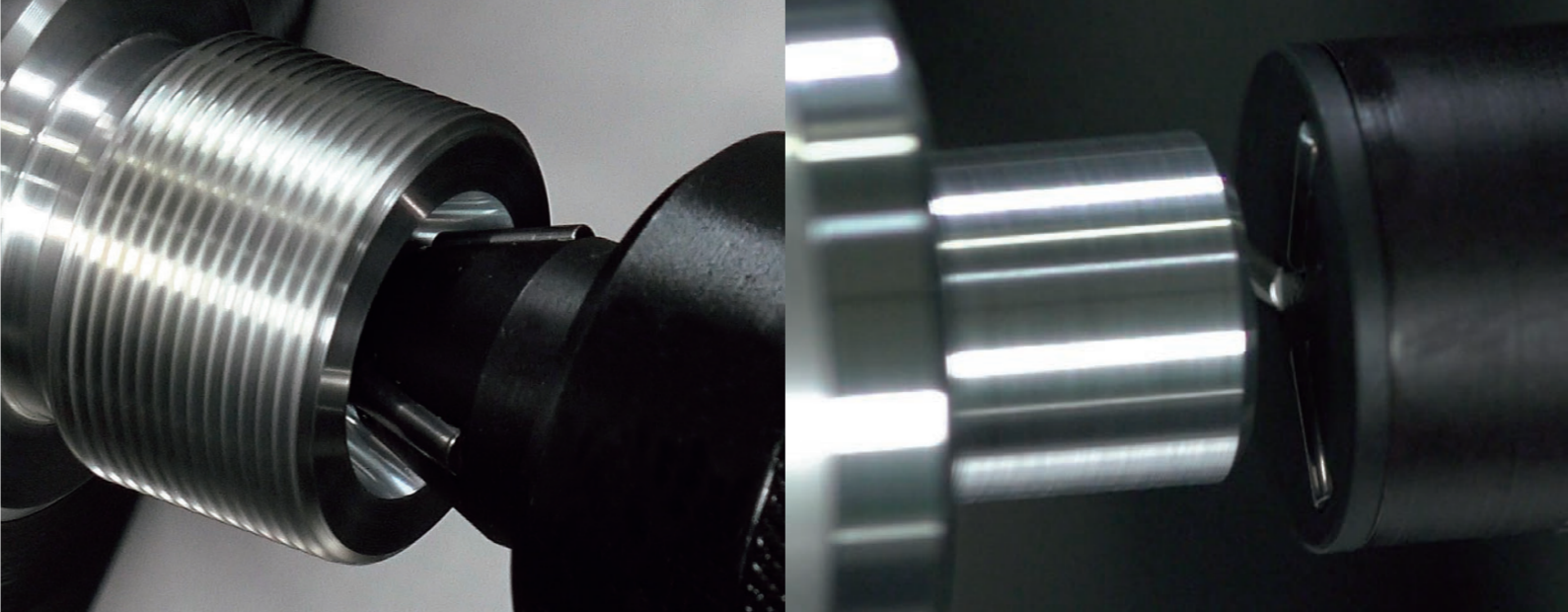
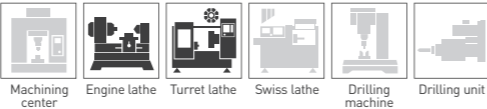
Burnishing video



BPSR

BPSR is a micro dimples forming Superoll for outer surface and the design is based on Superoll SR5A. It can be burnishing various diameters and workpieces by attaching to lathes.

Workpiece size $\phi 10\text{mm}$ or more
(Available diameter varies depending on workpiece length.)



Compressive Type

Burnishing sealing surfaces with Superoll by each shapes

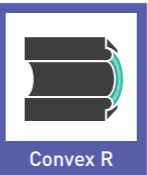
Compressive type Superoll for finishing by applying loads with a spring embedded within Superoll. Ideal for burnishing surfaces that requires sealing properties. Compressive type Superoll is designed and manufactured to suit the shape of workpieces respectively like taper, flat and R surfaces.

Inner taper surface



ST
CST

Convex R surface



FD
CFD

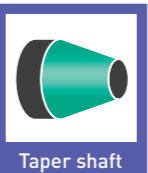
Flat end surface



SF
CSF



Outer taper surface



SE
CSE

Compressive Type Burnishing sealing surfaces with Superoll by each shapes



Taper hole

Superoll ST

Superoll ST is suitable for sealing surface burnishing like valve seats.

Hole size



D: $\phi 3\text{mm}$ or more

Burnishing image





Machining center Engine lathe Turret lathe Swiss lathe Drilling machine Drilling unit

For compact type, refer to page 30.



Burnishing example



Left: Body (Stainless steel tube joint)
Right: Gas cock body

Burnishing video



Superoll ST overview





Convex R

Superoll FD

Superoll FD is suitable for sealing surface burnishing like R sheet surface of piping joint.

Convex R size



D: $\phi 4\text{mm}$ or more

Burnishing image





Machining center Engine lathe Turret lathe Swiss lathe Drilling machine Drilling unit

For compact type, refer to page 30.



Burnishing example



Piping joint for semiconductor manufacturing equipment

Burnishing video



Superoll FD overview



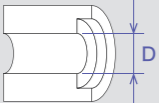


Counterbore surface End surface

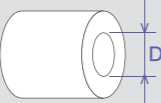
Superoll SF

Superoll SF is suitable for sealing surface burnishing like spline hub, flange surface of joint, clutch parts, semiconductor valves and so on.

Available size

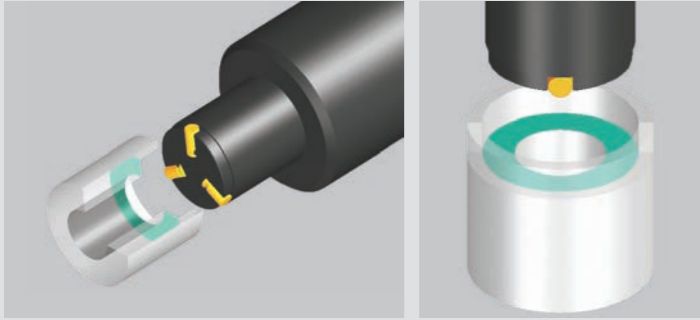


D: $\phi 5.5\text{mm}$ or more



D: $\phi 2\text{mm}$ or more

Burnishing image





Machining center Engine lathe Turret lathe Swiss lathe Drilling machine Drilling unit

For compact type, refer to page 30.



Burnishing example



Body
(Joint for semiconductor manufacturing equipment)

Burnishing video



Superoll SF overview





Taper shaft

Superoll SE

Superoll SE is suitable for sealing surface burnishing like a joint and valve.

Small taper size



D: $\phi 1.5\text{mm}$ or more

Burnishing image





Machining center Engine lathe Turret lathe Swiss lathe Drilling machine Drilling unit

For compact type, refer to page 30.



Burnishing example



Joint

Burnishing video



Superoll SE overview



Compressive Type Burnishing sealing surfaces with Superoll by each shapes

Superoll
CST/CSF/CFD/CSE

These Superolls are compact type of compressive Superolls with shortening the protruded tool length and can be attached to Swiss lathe.

Head assembly is the same dimension as ST, SF, FD and SE respectively.
Only compressive shank assembly are miniaturized.

Compact specification

Units: mm

(30)
Protruded tool length

75

*Select shank diameter from a table below.

Normal specification

(132)
Protruded tool length

(φ45)

Head assembly Compressive shank assembly

Superoll	Protruded tool length (mm)	Shank diameter D (mm)	Shank length (mm)
CST	Around 40 – 60	φ19.05 φ20 φ22 φ25 φ25.4	75
CSF	Around 25 – 60		
CFD	Around 25 – 60		
CSE	Around 25 – 60		

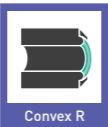
*Superoll CST, CSF, CFD and CSE are designed in accordance with customer's workpiece.
For detailed specification, contact your nearest sales office by using the catalog inquiry sheet, or use the inquiry form on our website.



CST



CSF



CFD



CSE



Burnishing video



Diamond-tool Type CAT'S EYE series

Burnishing materials with high hardness of HRC40 - 60

Diamond-tool type Superoll for finishing by pressing diamonds tip to workpieces.
Ideal for finishing high-hardness materials of HRC40 - 60 that roller type Superolls have difficulty finishing.
The diamond tip has a throw-away design that allows for easy replacement.

Outer surface

Shaft

Shaft with step

End surface

End surface

Inner surface

Through-hole

Blind-hole

Multiple surface

Shaft

Shaft with step

Taper shaft

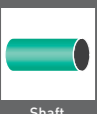
R surface 1

R surface 2


End surface

Counterbore surface

Diamond-tool Type Burnishing materials with high hardness of HRC40 - 60



Shaft



Shaft with step

CAT'S EYE CEO

CAT'S EYE CEO is for outer surface burnishing.






Available hardness **HRC40 - 60**


Attachment image to a driving unit

Burnishing scene


Effective burnishing range

*Effective burnishing range is the same as CEF and CEH.







Burnishing video



Selection chart / Burnishing conditions table





End surface

CAT'S EYE CEF






CAT'S EYE CEF is for end surface burnishing.


Available hardness **HRC40 - 60**

Effective burnishing range **The same as above CAT'S EYE CEO.**


Burnishing scene


Diamond tip (Close-up photo)





Selection chart / Burnishing conditions table





Through-hole



Blind-hole

CAT'S EYE CEH

CAT'S EYE CEH is for inner surface burnishing.

Available hardness **HRC40 - 60**




Effective burnishing range **The same as above CAT'S EYE CEO.**



Burnishing scene

Diamond tip (Close-up photo)


CEH-4D1 (Hole size: $\phi 20\text{mm}$ or more)

CEH-2D1 (Hole size: $\phi 13\text{mm}$ or more)



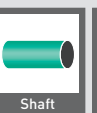


Burnishing video




Selection chart / Burnishing conditions table







Shaft




Shaft with step




Taper shaft



R surface 1



R surface 2



End surface



Counterbore surface

CAT'S EYE CEO-AJ

CEO-AJ can be adjusted the tool tip angle. Thanks to the wider burnishing effective range, CEO-AJ can burnish various shapes of workpiece.

Available hardness **HRC40 - 60**

Burnishing data

Before

After

Rz6.2 μm

Rz0.3 μm

Burnishing scene

Diamond tip (Close-up photo)

Effective burnishing range

Tool attachment direction

Tool tip direction can be adjustable every 15° in the range of 90°.





Available burnishing shapes

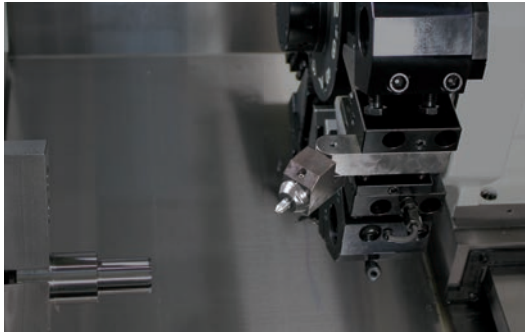

<Burnishing example> Outer, Corner R and End surface

Convex R surface


Concave R surface

*The top of the sphere cannot burnish due to peripheral speed 0.






Burnishing video



Selection chart / Burnishing conditions table



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Roller burnishing Tool

SUPEROLL


Interactive Catalog
APP for Smartphones and Tablets

Available for iOS Android



This App helps you to select the appropriate Superoll easily according to the workpiece dimension and material, etc.

When you input the workpiece information such as dimension and material, suitable Superoll will be suggested.
In case that various types of Superoll are suggested, please select the suitable one for your purpose, based on the ranking of the compared features.
Then, model, outside drawing and burnishing conditions according to your driving unit are shown after inputting shank size.
FAQ, technical information and our new product information are updated.

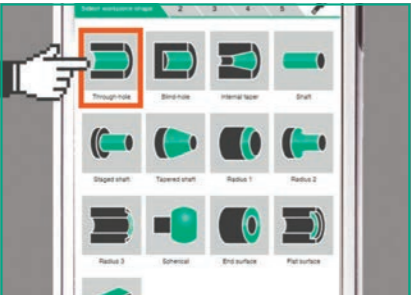
for iOS




for Android



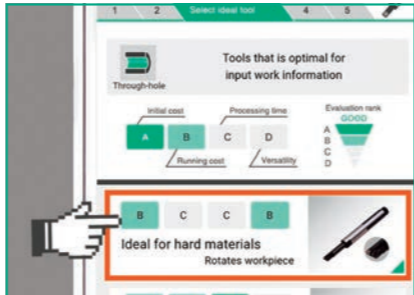
How to use the App



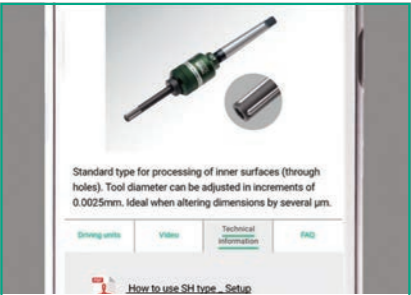
STEP1
Select your workpiece shape to burnish.




STEP2
Input dimensions, materials and workpiece information.



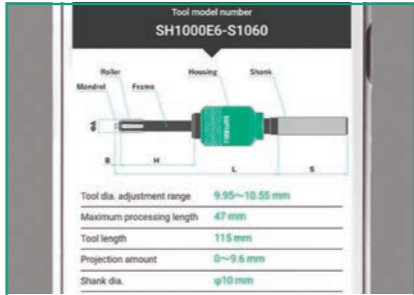
STEP3
Compare the features and select the tool.



STEP4
Check out the tool details from video and technical information.



STEP5
Select the tool specifications such as Shank size, Handed direction etc..



You can see the tool information and Burnishing parameters.

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iOS is a trademark or a registered trademark of Cisco Systems, Inc. in U.S.A and other countries. Android and Google Plat are trademarks of Google LLC.

Superoll Inquiry Sheet

Contact us

SUGINO MACHINE LIMITED Kakegawa Plant
E-mail tool@sugino.com

● Contact information (Fields with * are required.)

*Name	
*Company Name	
Division	
*Company Address	

Requested response due date:

*Phone	
Fax	
E-mail Address	

● Fill in the following contents.

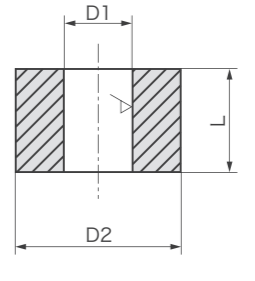
Workpiece name		
Workpiece material		
Workpiece hardness	(HRC, HV, HB, Others)	
Workpiece form (Circle one.)	① ② ③ ④ ⑤ ⑥	▶▶ Work configuration
Diameter ϕ D1	ϕ	Tolerance
Diameter ϕ D2	ϕ	Tolerance
Length L		Tolerance
Interference height H		Tolerance
Corner R		
Angle θ°	degree	Tolerance
Driving unit in use		
Required shank form		
Tool length limitation (shank length not included)		
Tool weight limitation (holder weight not included)		
Purpose of use (Circle one or more.)	<ul style="list-style-type: none">• Improvement of surface roughness• Hardness improvement• Dimensional correction• Others	

● Clarify the unit. (e.g., μ m, mm, Rz, HRC, HV, HB)

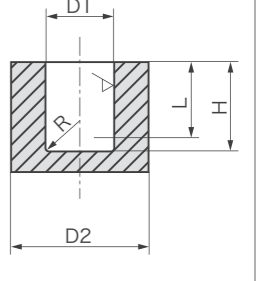
Surface roughness	Before burnishing	After burnishing
Hardness improvement	Before burnishing	After burnishing
Dimensional correction	Before burnishing	After burnishing
Other accuracy	Before burnishing	After burnishing
Work piece drawing (Please attach a drawing of the work in order to check interference between the tool and the work.)	Attached / Not attached	
Remarks		

☐ Visit by our salesperson (Check here if requesting.)

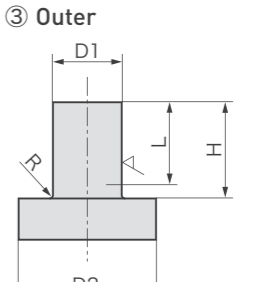
① Through-hole



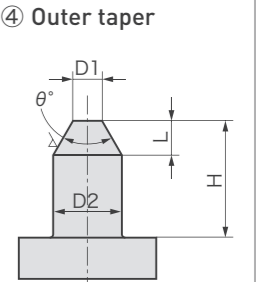
② Blind-hole



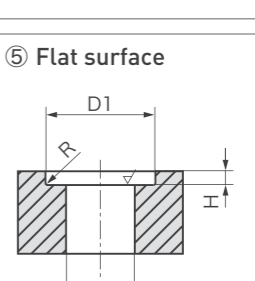
③ Outer



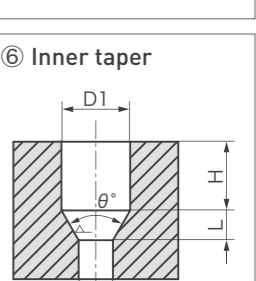
④ Outer taper



⑤ Flat surface



⑥ Inner taper



Special tools for work configurations not shown below can be produced.

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