Before Using Superoll Tools

Part Pre-Process Condition

Pre-Process Surface Finish

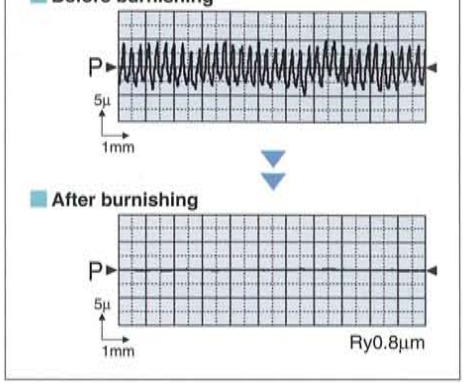
Superoll processing is most effective when the pre-burnish surface has as micro finish of 100 or less. Drastic changes in the finish of the pre-burnished surface will alter the outcome and overall quality of the burnishing process.

Pre-Process Dimensional Requirements

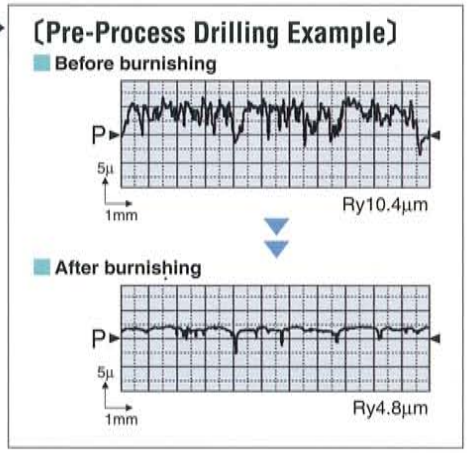
Superoll processing is most effective when the pre-burnish surface, ID or OD, is maintained to the tolerance chart listed below. Drastic changes in stock conditions will alter the outcome and overall quality of the work piece.

Processing Diameter		Pre-Burnish Diameter Stock	
Inch	mm	Inch	mm
.177~ .299	4.5~ 7.6	.00020~.00078	0.005~0.020
.315~ .570	8 ~ 14.5	.00028~.00098	0.007~0.025
.591~ .944	15 ~ 24	.00060~.00137	0.015~0.035
.985~1.732	25 ~ 44	.00079~.00157	0.020~0.040
1.772~2.913	45 ~ 74	.00099~.00177	0.025~0.045
2.953~7.874	75 ~200	.00119~.00236	0.030~0.060

〔Pre-Process Boring Tool Example〕



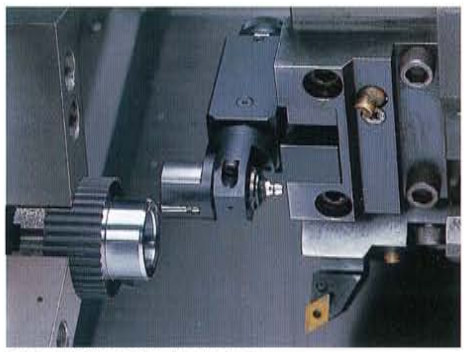
〔Pre-Process Drilling Example〕



Machine Tool & Lubrication

Machine Tool

Sugino's Superoll burnishing tools do not require the use of a special machine tool for operation. Superoll tools will adapt to machining centers, manual and CNC lathes, Bridgeport's and stand alone drill presses. Designed for a wide variety of applications, Sugino has a Superoll tool to meet your production requirements.
When using a machining center or CNC lathe for the burnishing process, it is important to wash chips and debris from the work piece with a flood coolant system to prevent damage to the Superoll tool.



Typical CNC Lathe Application

Lubrication and Filtration

In general, the roller burnishing process will generate a small amount of fine chips/debris. Sugino strongly recommends the use of Superoll Oil or coolant to flush the contamination from the work piece.
Sugino recommends the use of a filtration system for the processing solution with a filtration level ranging from 5-40um to prevent the introduction of contamination onto the work piece.

The Roller Burnishing Process

Surface Hardness

Sugino's standard Superoll products are designed to process materials with a surface hardness up to 40 Rockwell C. The Diamond Superoll(Pages 18&19) and the Ball Point Tool (Page 23) are designed to process materials and hardened surfaces up to 65 Rockwell C.

Pre-Burnish Part Requirements

The roller burnishing process has certain requirements pertaining to wall thickness of the feature(s) to be processed. Please contact the nearest Sugino Representative to discuss these specific requirements. Listed below are suggestions to enhance the burnishing process when wall thickness is an issue.

1.Maintain a pre-burnish surface finish of 40Ra or less.
2.Fixturing supports on the OD surface may be used.
3.Contact Sugino's Engineering Team

Work Piece Configuration

Sugino designs special tools with an increase in the number of processing rollers for features that have interrupted cuts such as key ways or cross-holes.

Special Purpose Tools

Sugino will design and build a custom tool to meet your exact manufacturing specifications. Please fill out the inquiry form on page 27 or contact your local Sugino Representative for further assistance.

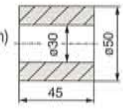
1.Burnishing using a specially designed machine tool.
2.Special Shank Configurations
3.Coolant Through Designs
4.Hardened Material Burnishing
5.Thin Wall Burnishing
6.Simultaneous Multi-Diameter Burnishing.

Pre-Burnished and Burnished Surface Finish Comparison.

The illustrations shown to the right detail specific relationships between the pre-burnish stock amount and pre-burnish surface finish in the various materials listed. Please note that these illustrations are only examples. Actual processing conditions will vary.

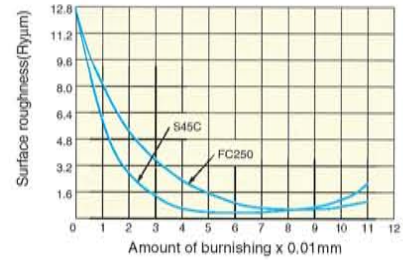
〔Machining Parameters〕

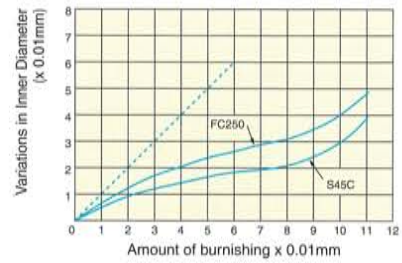
Part Dimensions : Outer Diameter50 x Inner Diameter30 - Length45(mm)
Pre-Burnish Process : Boring
Tool : SH3000 SUPEROLL
Rotation speed : 530min^{-1}
Feed Rate : 0.5mm/rev



■ Ferrous Metals

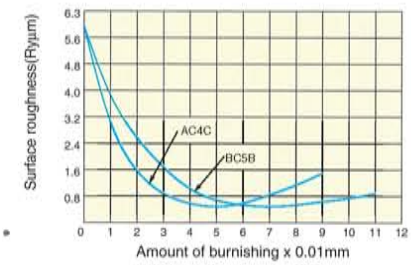
Materials : S45C, FC250

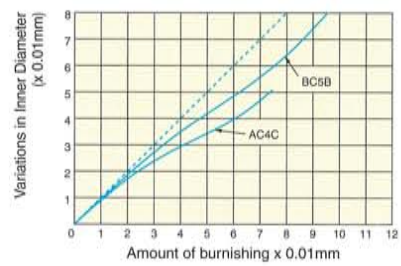




■ Non-Ferrous Metals

Materials : AC4C, BC5B





Burnishing amount = [Tool diameter] – [Superoll preprocessed inner diameter]

Amount of inner diameter enlargement = [Inner diameter after Superoll processing] – [Inner diameter before Superoll processing]