

SUPERFINISH

Finishing of all Standard Bearing Components, Inner and Outer Races



- cylindrical roller bearings
- needle roller bearings
- tapered roller bearings
- spherical roller bearings
- self-aligning roller bearings

- axial self-aligning roller bearings
- CARB® bearings
- angle-setting cyl. roller bearings
- grooved ball bearings
- shaft and housing disks

For bearing components (inner and outer races and antifriction bearing parts) with one or more tracks and functional surfaces

- generation of any required cross-sections such as concave, convex, semi-barrel shaped, hollow, logarithmic; using patented NC controlled overlay motion with linear, circular or virtual oscillation systems
- correction of ground or hard-turned cross-sections using patented NC-overlay motion
- variable and automatic amplitude, oscillation, contact, conical angle setting and oscillating frequency control
- machining in one clamping operation
- NC controlled pressure rolls and / or combined hydraulic internal centering
- variable centering systems
- final finishing directly from hard-turned pre-machined state
- CNC controls with digital drives for linear and rotary motion
- single or multiple stage machining with multiple stone-change system
- optional cup-wheel and tape finishing
- rapid re-tooling in less than 9 minutes
- finely adjustable stone pressures due to hydraulic bypass system
- optional machining of flange face, shoulder, IR bore using SUPERFINISH stone
- optional machining of IR flange face and OR outer surface using SUPERFINISH tape
- manual feed / discharge, automated as an option

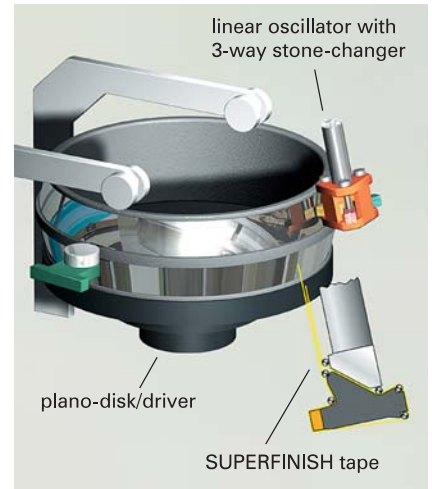
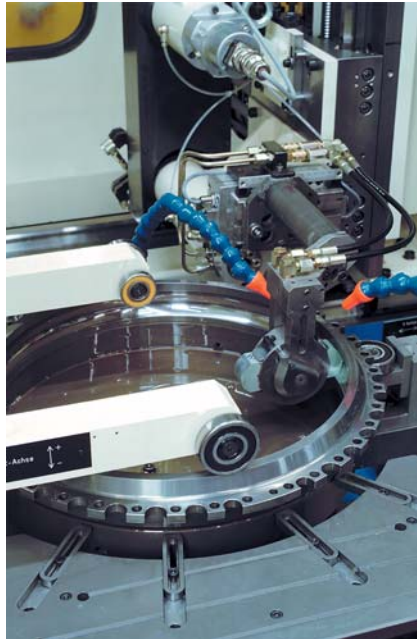


supfina 725-727/1-NC (620)

Technical specifications:

Operations:	1
NC horizontal slides:	1
NC vertical slides:	up to 6
Machining units:	up to 6
Race outer diameter:	45–620 mm
Bore diameter:	20–580 mm
Race height:	20–200 mm
Track angle:	0°–55°

The machining process



Sample finishing application conical roller bearings IR finishing

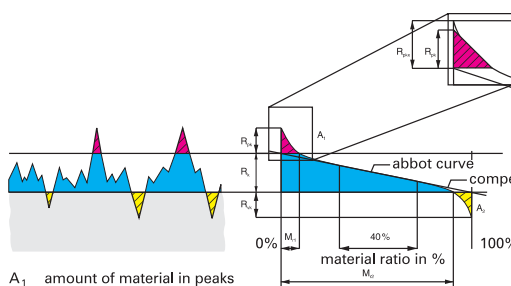
The SUPFINA 725-727 series has been specifically designed to be an extremely versatile SUPERFINISH machine for finishing spherical (convex/concave), linear (cylindrical/conical) and other curved track, functional, locating and mounting surfaces for all standard bearing units (inner and outer races). Depending on the specific application, up to 6 different SUPERFINISH units

(linear, circular oscillating, flange face finishing, inside and outside tape finishing, virtual SF units, SF units with rotary tools) can be mounted on common NC horizontal slides.

Each individual unit, equipped with an NC vertical slide, can be synchronised with the horizontal NC axis in a circular or linear interpolation mode depending on the finishing operation required.

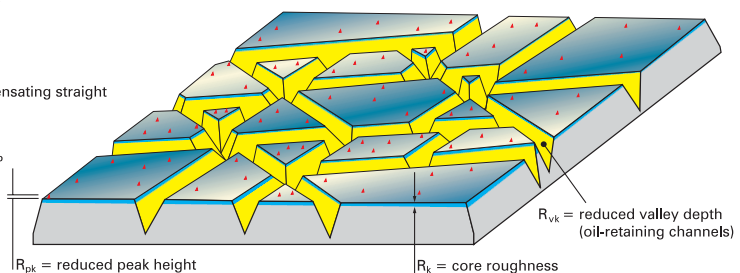
A wide range of workpiece mountings and centring systems are available for numerous system variations, such as IR/OR roll Centrimatic, carrier discs, hydrodynamic bore centering, magnetic clamping, 3 roll IR/OR centering etc.

The results



- A_1 amount of material in peaks
- A_2 surface ratio of valleys
- R_k core roughness
- R_{pk} reduced peak height
- R_{vk} reduced valley depth
- $M_{r,1}$ smallest material ratio of core profile
- $M_{r,2}$ largest material ratio of core profile

Plateau-like functional surface to DIN 4776



Cylindrical roller bearing, outer race

outer diameter approx.: 346.5 mm
 track diameter approx.: 320 mm
 track width approx.: 28 mm
 race height: 40 mm
 material: M 52
 hardness: 60–64 HRC
 cycle time for two-stage track finishing and outer diameter with tape: 160 sec.

surface roughness R_a : $< 0.02 \mu\text{m}$
 $D \ q$ at 90° to track: 3.5°
 $D \ q$ along track: 1.5°
 R_{sk} : -3
 bearing ratio tpi: 95% ($c=0.2$; datum line 2%)
 R_{vk} : $> 0.1 \mu\text{m}$
 runout: $< 1.0 \mu\text{m}$
 cross-section: straight to barrel 0 to $< 1.0 \mu\text{m}$
 stock removal: 8–10 μm