BearingStar
Innovation in precision machining
HIGHEST QUALITY PRECISION MACHINING OF ROLLER BEARING RACEWAYS

Precision machining of rolling bearings today has to be flexible, highly productive and economical. The BearingStar is a modern, modular machine solution that has been designed precisely with these aims in mind. Microfinish processing significantly improves the roundness and roughness of roller bearing surfaces, enabling top quality. After machining, the anti-friction bearings also display a higher load-bearing capacity and longer service life, as well as lower noise emissions.

BENEFITS AT A GLANCE

- **Increase in precision and performance** thanks to innovative Microfinish precision machining
- **Increased flexibility** through several tool oscillation units in one machine, e.g. for ball or roller bearing raceways
- **Universal machine platforms** for all anti-friction bearing types
- **Short set-up times** thanks to the menu-driven set-up and workpiece visualisation on the monitor
- **Interactive online direct service** via the Internet

NEW GENERATION OF MACHINES FOR FLEXIBLE AND EFFICIENT MICROFINISH MACHINING OF RACEWAYS

RING OUTSIDE DIAMETER

<table>
<thead>
<tr>
<th>P.</th>
<th>Machine Type</th>
<th>Ring Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>BearingStar mini</td>
<td>5 – 19 mm</td>
</tr>
<tr>
<td>6</td>
<td>BearingStar 90</td>
<td>26 – 90 mm</td>
</tr>
<tr>
<td>6</td>
<td>BearingStar 120</td>
<td>60 – 120 mm</td>
</tr>
<tr>
<td>7</td>
<td>KM 90 evo</td>
<td>26 – 90 mm</td>
</tr>
<tr>
<td>8</td>
<td>BearingStar 200</td>
<td>85 – 200 mm</td>
</tr>
<tr>
<td>9</td>
<td>BearingStar 320</td>
<td>180 – 320 mm</td>
</tr>
<tr>
<td>10</td>
<td>BearingStar 650</td>
<td>200 – 650 mm</td>
</tr>
</tbody>
</table>

ROLLER OUTSIDE DIAMETER

<table>
<thead>
<tr>
<th>P.</th>
<th>Machine Type</th>
<th>Roller Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Infinity 600</td>
<td>1.5 – 15 mm* (50 mm)</td>
</tr>
<tr>
<td>11</td>
<td>Infinity 900 – 1100</td>
<td>5 – 35 mm</td>
</tr>
</tbody>
</table>

*Main area of application
**HYPERFINISH: SHORTER PROCESSING TIME + HIGHER QUALITY**

Equipped with the innovative HyperFinish technology (optional), up to 4 μm more material removal can be achieved and, depending on the workpiece and task, higher qualities as well. Your increased productivity will allow you to do without additional machining stations and/or machines, resulting in operational cost savings.

- **Up to 4 μm more material removal** thanks to a higher level of tool cutting capability
- **Improved quality and form parameters** thanks to a reduced oscillation angle
- **Highest quality with transverse shape and roundness** by plunge-cutting with wide honing stone tool on four-point ball tracks with gothic profile

**CONVENTIONAL PROCESSING PRINCIPLE**

- Rotation of the workpiece
- Oscillation of the honing stone
- Contact of the honing stone

**HYPERFINISH PROCESSING PRINCIPLE (OPTIONAL)**

- Rotation of the workpiece
- Main oscillation of the honing stone
- Additional, high-frequency oscillation
- Contact of the honing stone

---

Roughness | Ra 0.0593 μm  
Stone contact time | 25 sec  
Material removal | 5 μm  

Example: Tapered roller bearing inner ring, 50 mm bore

---

Roughness | Ra 0.0553 μm  
Stone contact time | 20 sec  
Material removal | 8 μm  

Example: Tapered roller bearing inner ring, 50 mm bore
MENU-GUIDED OPERATOR SUPPORT

WORKPIECE VISUALISATION AND AUTOMATIC NC PROGRAM GENERATION (OPTIONAL)

The input of the workpiece dimensions can be done on a screen displaying the workpiece with its main dimensions and the machining process as a table with forces, speeds, etc.

RACEWAY PROFILE OPTIMISATION (OPTIONAL)

Logarithmic or convex raceway profiles can be preserved or even improved at their ends by overlapping-stroke Microfinish with a narrow stone and variable speeds.

MENU-GUIDED SETUP (OPTIONAL)

Screens can be created to visualise the set up, which display the setup tasks in order. The operator carries out the task and confirms it has been executed. After confirmation the next task to be carried out is shown on the screen. This procedure continues until all necessary steps have been performed. Only then can the machining program be started.
BEARINGSTAR MINI

Fully automatic MICROFINISH machine for machining miniature ball and roller bearing inner and outer rings according to the 1-step method

RING TYPES

- Deep groove ball bearings (DGBB)
- Angular contact ball bearings (ACBB)
- Cylindrical roller bearings (CRB)
- Special bearings

TECHNICAL DATA

- Number of machining stations: 1
- Workpiece diameter: 5 – 19 mm
- Workpiece width: 2.5 – 15 mm
- Workpiece spindle speed: 0 – 36,000 rpm
- Oscillation frequency: 0 – 1,200 double strokes/min
- Radial oscillation angle: +/-0 – 15°
- Linear oscillation stroke: 0 – 2 mm
- Stone contact pressure: 0 – 10 N

MACHINING SOLUTIONS

- 1-step machining with a stone type
- Pre- and final machining by changing the cutting speed, stone contact pressure and oscillation
BEARINGSTAR BS 90 / BS 120

Fully automatic MICROFINISH machines for machining ball and roller bearing inner and outer rings in line with the 1- or 2-step method

RING TYPES

- 1- or 2-row radial ball bearings
- Axial ball bearings
- 1- or 2-row angular ball bearings
- Cylindrical roller bearings
- Tapered roller bearings

MACHINING SOLUTIONS

- 1-step machining on a 1-station machine
- 1- or 2-step machining as desired on a 2-station machine
- Outer or inner rings in one machine
- Pre- and final machining by changing the cutting speed, stone contact pressure and oscillation
- Mechanical radial or linear oscillation
- Mechanical adjustment of the raceway position
- P2 raceway quality

TECHNICAL DATA

<table>
<thead>
<tr>
<th></th>
<th>BS 90</th>
<th>BS 120</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR - outside diameter</td>
<td>26 – 90 mm</td>
<td>60 – 120 mm</td>
</tr>
<tr>
<td>IR - inside diameter</td>
<td>10 – 50 mm</td>
<td>30 – 80 mm</td>
</tr>
<tr>
<td>Ring width</td>
<td>8 – 35 mm</td>
<td>12 – 40 mm</td>
</tr>
<tr>
<td>Workpiece spindle speed</td>
<td>0 – 6,000 rpm</td>
<td></td>
</tr>
<tr>
<td>Oscillation frequency</td>
<td>0 – 1,200 double stroke/min</td>
<td></td>
</tr>
<tr>
<td>Oscillation angle</td>
<td>+/-0 – 18°</td>
<td></td>
</tr>
<tr>
<td>Linear oscillation stroke</td>
<td>0 – 6 mm</td>
<td></td>
</tr>
<tr>
<td>Stone contact pressure</td>
<td>0 – 170 N</td>
<td></td>
</tr>
<tr>
<td>Number of machining stations</td>
<td>1 or 2</td>
<td></td>
</tr>
</tbody>
</table>
KM 90 EVO

Fully automatic MICROFINISH machine for machining ball and roller bearing inner and outer rings in line with the 1- or 2-step method for flexible machining with NC adjustment of the raceway position and direct drive of the oscillation unit.

RING TYPES

- 1- or 2-row radial ball bearings
- Axial ball bearings
- 1- or 2-row angular ball bearings
- Cylindrical roller bearings
- Tapered roller bearings

TECHNICAL DATA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>BS 90</th>
<th>KM 90 EVO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outer ring outside diameter</td>
<td>26 – 90 mm</td>
<td></td>
</tr>
<tr>
<td>Inner ring inner diameter</td>
<td>10 – 50 mm</td>
<td></td>
</tr>
<tr>
<td>Ring width</td>
<td>8 – 55 mm</td>
<td></td>
</tr>
<tr>
<td>Workpiece spindle speed</td>
<td>0 – 10,000 rpm</td>
<td></td>
</tr>
<tr>
<td>Oscillation frequency</td>
<td>0 – 1,200 double stroke/min</td>
<td></td>
</tr>
<tr>
<td>Oscillation angle</td>
<td>+/-0 – 16°</td>
<td></td>
</tr>
<tr>
<td>Linear oscillation stroke</td>
<td>0 – 6 mm</td>
<td></td>
</tr>
<tr>
<td>Stone contact pressure</td>
<td>0 – 140 N</td>
<td></td>
</tr>
<tr>
<td>Number of machining stations</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

MACHINING SOLUTIONS

- 1- or 2-step machining option
- Outer or inner rings in one machine
- Outer raceway and board for tapered roller inner rings
- Direct driven radial or linear oscillation unit
- NC adjustment of the raceway position
- P2 raceway quality
- Use tooling from the previous version
- Automatic programming
- Driver height adjustment
- HyperFinish® technology (optional)
- Menu-guided setup (optional)

COMPARISON KM 90 EVO AND BS 90

<table>
<thead>
<tr>
<th>Parameter</th>
<th>BS 90</th>
<th>KM 90 EVO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of machining stations</td>
<td>1 or 2</td>
<td>2</td>
</tr>
<tr>
<td>Mechanical radial or linear oscillation unit with manual adjustment of oscillation, oscillation angle and stroke</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Direct drive radial or linear oscillation unit with automatic adjustment of oscillation, oscillation angle and stroke</td>
<td>yes (optional)</td>
<td>yes</td>
</tr>
<tr>
<td>HyperFinish® technology for up to 4 μm more material removal and for four-point ball bearing raceways</td>
<td>no</td>
<td>yes (optional)</td>
</tr>
<tr>
<td>Microfinish of ball and roller bearing raceways in just one machine</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>NC setting of the X-Z axis position of the raceways</td>
<td>yes (optional)</td>
<td>yes</td>
</tr>
<tr>
<td>Use tooling from previous version</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Raceway quality</td>
<td>P2</td>
<td>P2</td>
</tr>
<tr>
<td>Loading and unloading</td>
<td>1.8 s</td>
<td>1.0 s</td>
</tr>
</tbody>
</table>
BEARINGSTAR 200

Fully automatic MICROFINISH machine for machining ball and roller bearing inner and outer rings in line with the 1- or 2-step method

TECHNICAL DATA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outer ring outside diameter</td>
<td>85 – 200 mm</td>
</tr>
<tr>
<td>Inner ring inner diameter</td>
<td>50 – 180 mm</td>
</tr>
<tr>
<td>Ring width</td>
<td>15 – 80 mm</td>
</tr>
<tr>
<td>Workpiece spindle speed</td>
<td>0 – 3,000 rpm</td>
</tr>
<tr>
<td>Oscillation frequency</td>
<td>0 – 1,200 double strokes/min</td>
</tr>
<tr>
<td>Oscillation angle</td>
<td>+/-0 – 18°</td>
</tr>
<tr>
<td>Linear oscillation stroke</td>
<td>0 – 6 mm</td>
</tr>
<tr>
<td>Stone contact pressure</td>
<td>80 – 360 N</td>
</tr>
<tr>
<td>Number of machining stations</td>
<td>1 or 2</td>
</tr>
</tbody>
</table>
BEARINGSTAR 320

Fully automatic MICROFINISH machine for machining ball and roller bearing inner and outer rings in line with the 1- or 2-step method

RING TYPES

- 1- or 2-row radial ball bearings
- Axial ball bearings
- 1- or 2-row angular ball bearings
- Cylindrical roller bearings
- Tapered roller bearings
- Spherical roller bearings

TECHNICAL DATA

- Outer ring outside diameter: 180 – 320 mm
- Inner ring inner diameter: 100 – 270 mm
- Ring width: 20 – 200 mm
- Workpiece spindle speed: 0 – 3,000 rpm
- Oscillation frequency: 0 – 1,200 double stroke/min
- Oscillation angle: +/-0 – 18°
- Linear oscillation stroke: 0 – 6 mm
- Stone contact pressure: 80 – 360 N
- Number of machining stations: 1

MACHINING SOLUTIONS

- 1- or 2-step machining
- Outer or inner rings on one machine
- Outer raceway and board for tapered roller inner rings on 1-station machine
- Outer diameter polishing with belt unit (optional)
- Range velocity programming for crowned or logarithmic roller raceways (optional)
BearingStar 650

Fully automatic MICROFINISH machine for machining ball and roller bearing inner and outer rings in line with the 1- or 2-step method

RING TYPES

- 1- or 2-row radial ball bearings
- Axial ball bearings
- 1- or 2-row angular ball bearings
- 1- or 2-row cylindrical roller bearings
- 1- or 2-row tapered roller bearings
- Spherical roller bearings

MACHINING SOLUTIONS

- 1- or 2-step machining
- Outer or inner rings
- Pre- and final machining by changing the cutting speed, stone contact pressure and oscillation
- Board Microfinish
- Outer diameter polishing with belt unit (optional)
- Microfinish of crowned or logarithmic roller tracks with vertical adjustment of the honing stone allows increased overall speed and reduction in machining time.

TECHNICAL DATA

Outer ring outside diameter 200 – 650 mm
Inner ring inner diameter 180 – 580 mm
Ring width 20 – 300 mm
Workpiece spindle speed max. 1,000 rpm
Oscillation frequency 0 – 1,200 double strokes/min
Oscillation angle +/-0 – 18°
Linear oscillation stroke 0 – 6 mm
Stone contact pressure max. 360 N
Number of machining stations 1

MicroSens power-controlled cup wheel machining of roller bearing outer rings

INNOVATION (PATENT)

Linear oscillation unit with integrated torque motor

CONVENTIONAL SOLUTION
Machining with narrow tool and overlay stroke without pitch correction

NEW SOLUTION
Wide toolpiece machining and overlay stroke with pitch correction

Radial oscillation unit for roller bearing inner rings
INFINITY

Automatic MICROFINISH machine for machining small and medium-sized rollers in mass production

ROLLER TYPES

- Cylindrical rollers
- Tapered rollers
- Needle rollers

TECHNICAL DATA

<table>
<thead>
<tr>
<th></th>
<th>INFINITY 600</th>
<th>INFINITY 900 – 1100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machining diameter</td>
<td>1.5 – 15 mm* (50 mm)</td>
<td>6 – 35 mm</td>
</tr>
<tr>
<td>Drive roller speed</td>
<td>0 – 720 rpm</td>
<td>0 – 720 rpm</td>
</tr>
<tr>
<td>Drive roller length</td>
<td>600 mm</td>
<td>900 – 1,100 mm</td>
</tr>
<tr>
<td>Number of tool carriers</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Tool oscillation frequency</td>
<td>75 – 2,500 double strokes/min</td>
<td>75 – 2,500 double strokes/min</td>
</tr>
<tr>
<td>Horizontal tool oscillation stroke</td>
<td>0 – 4 mm</td>
<td>0 – 4 mm</td>
</tr>
<tr>
<td>Vertical tool oscillation stroke</td>
<td>50 mm</td>
<td>50 mm</td>
</tr>
<tr>
<td>Total connection</td>
<td>9 kW</td>
<td>9 kW</td>
</tr>
<tr>
<td>Minimum compressed air</td>
<td>4.5 bar</td>
<td>4.5 bar</td>
</tr>
<tr>
<td>Flushing oil flow rate</td>
<td>80 l/min</td>
<td>80 l/min</td>
</tr>
</tbody>
</table>

* Main area of application

MACHINING SOLUTIONS

- Cylinder profile
- Crowned profile
- Logarithmic profile
The Power of Precision.