Ball Screws for High-Speed Machine Tools
HMS Series

The SRC recirculation system series is a wonderful addition to our lineup of ball screws for machine tools, including our well-established HMC and HMD series*. This new series is particularly suited for machining centers for high precision machining.

Features

1. High speed
   Permissible rotational speed (d·n value) has increased from 135 000 to 160 000.

2. Low noise
   By adopting SRC recirculation system, the sound pressure level has been reduced by 5 dB compared with our existing product.

* SRC recirculation system: A high speed, low noise recirculation system used in the well accepted HTF-SRC Series designed for heavy load applications.
Ball Screws for High-Speed Machine Tools  HMS Series

- **Ball screw specifications**
  - Accuracy grade/axial play
    Accuracy grade: C3 and C5 grades of JIS standard
    Axial play: 0 (offset preload)
  - Nut dimensions
    Nut mounting and external dimensions are the same as existing tube type ball screws.
    Please see Table 2 for specifications and dimensions.
    *For any specifications other than the above, please contact NSK.

- **Optional specifications**
  - Cooling ball screws
  - Ball screws for twin-drive systems

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### Table 1  Permissible rotational speed and maximum feed speed

<table>
<thead>
<tr>
<th>Shaft dia.</th>
<th>Lead</th>
<th>Permissible rotational speed (min⁻¹)</th>
<th>8</th>
<th>10</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>4000</td>
<td>—</td>
<td>40 m/min</td>
<td>48 m/min</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>3550</td>
<td>28 m/min</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>3200</td>
<td>—</td>
<td>32 m/min</td>
<td>38 m/min</td>
<td></td>
</tr>
</tbody>
</table>

- **Maximum feed speed**
  By adopting the SRC recirculation system, the permissible rotational speed (d·n value) is improved and the maximum feed speed has been substantially increased.
  \[d \cdot n \text{ value: Increased to } 160,000 \text{ from } 135,000 \text{ in the existing products.}\]
  "d: shaft diameter (mm), n: rotational speed (min⁻¹)"

Please see Table 1 for permissible rotational speed and maximum feed speed.

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### Table 2  Nut dimensions

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Shaft dia.</th>
<th>Lead</th>
<th>Basic load rating (kN)</th>
<th>Axial rigidity K (N/μm)</th>
<th>External dimensions</th>
<th>Mounting hole dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZFRC4010-10</td>
<td>40</td>
<td>10</td>
<td>52.0/137</td>
<td>1090</td>
<td>166/82/124</td>
<td>A/11/17.5</td>
</tr>
<tr>
<td>ZFRC4012-10</td>
<td>40</td>
<td>12</td>
<td>61.0/155</td>
<td>1110</td>
<td>192/86/128</td>
<td>A/11/17.5</td>
</tr>
<tr>
<td>ZFRC4508-10</td>
<td>45</td>
<td>8</td>
<td>37.3/118</td>
<td>1160</td>
<td>136/82/124</td>
<td>A/11/17.5</td>
</tr>
<tr>
<td>ZFRC5010-10</td>
<td>50</td>
<td>10</td>
<td>57.7/175</td>
<td>1320</td>
<td>166/93/135</td>
<td>A/11/17.5</td>
</tr>
<tr>
<td>ZFRC5012-10</td>
<td>50</td>
<td>12</td>
<td>77.6/214</td>
<td>1360</td>
<td>198/100/146</td>
<td>A/14/20/13</td>
</tr>
</tbody>
</table>

Notes: 1. All of the above are right-hand screws.
2. Value shown as rigidity K is the value when 5% of the basic dynamic load rating Ca has been applied as the preload.

Handling precautions: Maximum operating temperature; 60°C (at outside diameter of ball nut)

For more information about NSK products, please contact: [www.nsk.com](http://www.nsk.com)

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NSK used environmentally friendly paper and printing methods for this publication.

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