**BALL SCREWS & BALL NUTS**

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Pitch</th>
<th>Diameter</th>
<th>Number of Ball Circuits</th>
<th>Axial Load (N)</th>
<th>Dynamic ($C_a$)</th>
<th>Static</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>2</td>
<td>4</td>
<td>3500</td>
<td>2600</td>
<td>5500</td>
</tr>
<tr>
<td>4</td>
<td>2.5</td>
<td>2</td>
<td>2600</td>
<td>4600</td>
<td>4200</td>
</tr>
<tr>
<td>5</td>
<td>3.5</td>
<td>2</td>
<td>4600</td>
<td>4600</td>
<td>7200</td>
</tr>
<tr>
<td>10</td>
<td>3.5</td>
<td>2</td>
<td>4200</td>
<td>4200</td>
<td>6500</td>
</tr>
<tr>
<td>20</td>
<td>3.5</td>
<td>2</td>
<td>1900</td>
<td>1900</td>
<td>2500</td>
</tr>
</tbody>
</table>

**LIFE EXPECTANCY**

$L = \left(\frac{C_a}{F_m}\right)^3 \times 10^6$

$L = \text{life expectancy expressed in number of revolutions}$

$C_a = \text{dynamic load rating (N), see specifications table}$

$F_m = \text{average axial load (N)}$

Example: For 10 mm pitch screw, $C_a = 4200$ N carrying an average axial load, $F_m = 200$ N (45 lbs.) the expected life is:

$L = \left(\frac{4200}{200}\right)^3 \times 10^6 = 9.261 \times 10^9$ revolutions.

At an average of 1000 rpm this will result in:

\[
\frac{9.261 \times 10^9 \text{ revolutions}}{1000 \text{ rpm}} \times \frac{1 \text{ hour}}{60 \text{ minutes}} = 154,000 \text{ hours}
\]

of expected operational life. Note that the nature of the motion (jerky, smooth, etc.) will affect the life expectancy.

**FORCE / TORQUE**

$M = \frac{F \times p}{2000 \times \pi \times 0.9}$

$M = \text{torque applied to screw (Nm)}$

$p = \text{screw pitch (mm)}$

$F = \text{resulting linear force (N)}$

Example: For a force of 200 N (45 lbs.) with a 10 mm pitch screw, the required torque is:

$M = \frac{200 \times 10}{2000 \times \pi \times 0.9} = 0.35 \text{ Nm} = 50 \text{ oz. in.}$
LOAD AND SPEED LIMITS ON
16 mm BALL SCREWS

CRITICAL SPEED & LOAD

**LOAD AND SPEED LIMITS**

<table>
<thead>
<tr>
<th>LENGTH (mm)</th>
<th>CRITICAL LOAD (kg)</th>
<th>CRITICAL SPEED (rpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>1000</td>
<td>10000</td>
</tr>
<tr>
<td>1000</td>
<td>1000</td>
<td>10000</td>
</tr>
<tr>
<td>10000</td>
<td>1000</td>
<td>10000</td>
</tr>
</tbody>
</table>

**BEARING SUPPORT TYPES**

- **FF** - Fixed, Fixed
- **FS** - Fixed, Open
- **FS** - Fixed, Simple
- **SS** - Simple, Simple
- **FO** - Fixed, Open
BALL SCREWS

HIGH LIFE EXPECTANCY
EXCELLENT COST PERFORMANCE RATIO

> MATERIAL:
Cf 53 induction-hardened to HRC 62 ± 2

> SPECIFICATIONS:
Pitch accuracy ≤ 0.1 mm / 300 mm, ISO class 7.
Screw pitches of 2.5, 4, 5, 10 and 20 mm.
Available with machined and unmachined ends in lengths up to 3 m.
Ø16 mm, rolled and polished.

Produce greater than 90% efficiency in converting rotary to linear motion.

Machined screws are designed to be held by a double bearing on one side and on the other side by either a floating bearing, or no bearing and a guiding ball nut.

Root Diameter: \( D_2 = 12.98 \) for 5, 10, 20 mm Pitch
\( D_2 = 13.34 \) for 2.5 mm Pitch

** These lengths are available machined only.

** Longer ball screws available on special request.
SERIES 1 ANTI-BACKLASH BALL NUTS

THIS ISEL BALL NUT IS A PATENTED ANTI-BACKLASH DESIGN

MATERIAL:

- Balls: Hardened Steel HRC 63 ± 2
- Ball Nut: Steel, Cf 53, ground, polished and hardened to HRC 62 ± 2

SPECIFICATIONS:

- Repeatability of 0.01 mm and accuracy of 0.1 mm/300 mm when used with our ball screws.
- Blank shaft is used to retain balls during shipment.
- Can be used with 16 mm ball screws; see index.
- Available in 2 heights of 25.3 mm and 28.5 mm.

Photographed with blank shaft to retain balls.

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Fig. No.</th>
<th>Pitch</th>
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<tbody>
<tr>
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<tr>
<td>S6653HM2130100</td>
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</tr>
<tr>
<td>S6653HM2130200</td>
<td></td>
<td>20</td>
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