NSK Ball Screws for High-Load Drive
NSKTAC Series of Ball Screw Support Bearings for High-Load Applications
NSK Roller Guide RA Series

We have developed easy-to-use ball screws for high-load applications and now offer a wide variety of products suited for high-load drives. These ball screws enable the electric servo drive to operate under the most severe conditions.
Lineup of NSK Ball Screws for High-Load Drive

Best suited design for high-load applications
The best arrangement of the ball recirculation circuits and use of the largest possible ball have significantly contributed to the enhancement of high-load bearing characteristics. (Refer to pages 6 and 7 for details.)

As well as long shafts, a variety of shaft end configurations are available for high torque transmission.

Examples:
- Involute spline (JIS B 1603)
- Straight-sided spline (JIS B 1601)
- Keyways

There are high load capacity options available for the above ball screws for applications where a large load is applied with relatively short strokes.
1 Examples of Application

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</table>

※ There are high load capacity options available for applications with large loads with relatively short strokes, such as press fitting machine. Please consult NSK.

Injection molding machine

- For mold clamp axial drive
  - HTF-SRD+A1 seal

- For injection axial drive
  - HTF-SRC-A1 seal, HTF-SRE, HTF

- For ball screw support
  - Ball screw support bearing NSK TAC series

Press machine

- Ejector axial drive
- Mold clamp force of 500t and over: HTF-SRC+A1 seal
- Mold clamp force under 500t: Horizontal ball screws for ejectors

Press part

- HTF-SRE, HTF-SRC+A1 seal, HTF-SRD+A1 seal

Die cushion part

- HTF-SRD+A1 seal

Die cast

- ○

- ○

- ○

- ○

- ○

- ○

- ○

- ○

- ○

- ○

- ○

- ○

- ○

- ○

High reliability

High-speed feeding

High environmental properties

2 Features

NSK high-load drive ball screws have maximized the ball diameter and increased the number of valid load balls for a design that can withstand a high load. They have achieved a high reliability through many different technologies including even load distribution. Technology for high-speed feeding and preserving the work environment have also been added to accommodate the needs of various devices requiring a large load and high reliability, such as hydraulic cylinder replacement.

- High reliability
- High-speed feeding
- High environmental properties

In addition to high load design, all series are equipped with ball retaining piece S1 for preventing ball competition and helping even nut load distribution, and original NSK technology to meet a high load bearing requirements.

- Feeding speed has been increased to improve efficiency of the machine and injection. Maximum speeds are 930 mm/s with a fine lead and 1,600 mm/s with a coarse lead.

- With sophisticated seal technology, grease splattering has been reduced and less topping up is needed in response to ever increasing concerns for environment.

The chart below shows technologies used for each series to achieve high reliability, high-speed feeding and environmental consideration.

<table>
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<tr>
<th>Technology used</th>
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</table>

Examples of Application Features

- High reliability
- High-speed feeding
- High environmental properties

The chart below shows technologies used for each series to achieve high reliability, high-speed feeding and environmental consideration.
Technical Description

2-1 High reliability

1 Design for high load
NSK ball screws for high load drive have increased load capacity by maximizing the diameter of balls in relation to the lead, increasing the number of valid load balls and optimizing the shape of ball groove for a design that can withstand high load.

2 Resin Retaining Piece NSK S1™
A moment load caused by misalignment of a ball screw can hinder smooth motion of the balls, thus causing ball jamming in the ball recirculation circuits and adversely affecting the durability of the ball screw. By incorporating the resin retaining piece NSK S1™ between balls, NSK has greatly improved the durability of ball screws under a moment load.

Durability test with continuous high load
Test model: HTF10025-7.5
All load balls (without S1), and with S1

Test conditions:
Load condition: Forward 200 kN, Back 20 kN
Stroke: 70 mm, Cycle time: 9 sec
Lubrication: Grease
Temperature: Normal

Mounting error:
Max. 0.03 mm 0.3 mm 0.3 mm

Load distribution to balls

3 Technology to evenly distribute nut load
With ball screws that carry large loads, it is important to distribute the load evenly to each ball. NSK high-load drive ball screws have improved reliability with the load distribution technology described below.

Theory of even load distribution 1 (applies to SRC and return tube types)
Ball return tubes are located 180 degrees apart for equal load distribution to the balls.
**Technical Description**

### Even load distribution [2]
With ball screws that carry a large load, the deformation of components (axis, nut) cannot be disregarded. Based on the load points adapted for screws and nuts in the illustration below (A) (recommended installation), the influence of contraction and expansion in the screw shaft and nut axial direction is offset and inner nut load is evenly distributed. To make these measures even more effective, axis and the cross section of nut are placed as close to each other as possible in HTF-SRC and HTF models.

### Options for high load capacity

#### Improving load bearing performance considerably
Load limits for high-load drive ball screws are

1. Allowable axial load (load limit beyond which stress on ball contact surface has extremely adverse effect on fatigue life)
2. Limit axial load (limit load of ball and axial groove contact surface reaching groove shoulder).

Through inner spec optimization, limit axial load can be up to 1.3 times greater than conventional high-load drive ball screws. These are suitable for applications where a large load is applied at relatively short strokes, such as sheet metal presses, press brakes, servo presses, mold presses, etc. Choices are made in consideration of balance between enhanced load bearing and service life. Please consult NSK.

#### A wide range of variations
Ball screws with this option are compatible with all types of high-load drive ball screws, such as HTF-SRC, HTF-SRD and grease-retaining A1 series in terms of size.

### High-speed feeding

#### 1 High d/n circulation route design
By smoothly picking up balls in the direction tangent to the screw groove, the impact of the balls colliding on other components will be reduced. d/n values (shaft diameter x number of rotations) for speed of circulation components is more than twice as fast as the conventional tube recirculation system.

#### 2 Ball groove shape for high speed
While rotating at a high speed, the ball collides with the axis at a high speed. With optimal-design ball grooves, pressure on the ball groove surface is minimized during ball collision, preventing shaft damage.

#### 3 Coarse lead setting
To achieve higher feeding, coarse lead setting is available (for example, shaft diameter 50 mm for a lead of 40 mm). This, along with high d/n values, enables a high speed feeding.
Technical Description

2-3 High environmental properties

1 Grease retaining A1 seal

<table>
<thead>
<tr>
<th>Greatly improved grease retaining performance</th>
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</table>
Thanks to the special ball groove profile of the screw shaft together with the grease retaining A1 seal, the grease retaining characteristics have greatly improved compared with those of existing plastic seals.

<table>
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<th>Noise level [dB (A)]</th>
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<tr>
<td>90</td>
</tr>
<tr>
<td>80</td>
</tr>
<tr>
<td>70</td>
</tr>
<tr>
<td>60</td>
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<tr>
<td>50</td>
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</table>

Grease leakage at initial cycle operation
(Test piece: HTF-ASRC6316-10.5 with high-load grease with an extreme pressure additive [worked penetration: 300])

<table>
<thead>
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<th>Test conditions</th>
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<td>HTF-ASRC6316-10.5</td>
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<tr>
<td>500 min⁻¹</td>
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<tr>
<td>Stroke</td>
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<tr>
<td>500 mm</td>
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<tr>
<td>Lubrication</td>
</tr>
<tr>
<td>High-load grease with an extreme pressure additive</td>
</tr>
</tbody>
</table>

By opening the discharge holes for running-in after grease supplementation, etc., excess grease is discharged. By removing excess grease, grease splatter in high speed operation is reduced.

Grease splash after 100-cycle operation

<table>
<thead>
<tr>
<th>Test conditions</th>
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<tbody>
<tr>
<td>HTF-ASRC6316-10.5</td>
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<tr>
<td>Speed</td>
</tr>
<tr>
<td>1 600 min⁻¹</td>
</tr>
<tr>
<td>500 min⁻¹</td>
</tr>
<tr>
<td>Stroke</td>
</tr>
<tr>
<td>500 mm</td>
</tr>
<tr>
<td>Lubrication</td>
</tr>
<tr>
<td>High-load grease with an extreme pressure additive</td>
</tr>
</tbody>
</table>

After initial run of 100 cycles at 200 min⁻¹, grease was wiped off from shaft OD, then photos were taken at the speed of 1600 min⁻¹.

| Grease retaining A1 seal |
| Grease leakage at initial cycle operation |
| Grease retaining A1 seal |

With conventional labyrinth seals

With grease retaining A1 seals

With existing plastic seals (stroke center area)

With grease retaining A1 seals (stroke center area)

 Consumers of the A1 seal greatly suppresses grease scattering, showing a significant improvement over the use of existing plastic seals. The A1 seal simplifies the design of your cover, helping to preserve a clean and healthy environment.

2 Low noise

<table>
<thead>
<tr>
<th>Low friction torque and low-heat generation</th>
</tr>
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</table>
The increase of dynamic torque caused by the A1 seal is very small (30 to 50 Ncm in case of ball screw with 80-mm diameter). This level of increase has practically no impact on the driving torque. The practical temperature rise caused by the A1 seal is merely 2 to 3 deg C higher than that of existing plastic seals.

<table>
<thead>
<tr>
<th>Construction of ball screw equipped with grease retaining A1 seal</th>
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</table>
By smoothly picking up balls in the screw shaft tangent direction, impact of ball collision on other components can be reduced. Compared to conventional tube type, the noise is reduced by over 6dB (A).
Technical Description

3 In use

1 Life of Ball Screw

Computational life, which is estimated by calculation, is the flaking life caused by rolling contact fatigue. The fatigue life of a ball screw can be estimated by basic dynamic load rating (Ca).

Basic dynamic load rating (Ca)

Basic dynamic load rating (Ca) is the axial load that allows 90% of a group of the same ball screws to rotate one million times (10^6 rev) under the same conditions without flaking occurring due to rolling contact fatigue. Basic dynamic load ratings (Ca) are shown in the dimension tables.

How to calculate fatigue life

The fatigue life of a ball screw is obtained by the following formula.

\[
L = \left( \frac{Ca}{Fa \cdot fw} \right)^3 \cdot 10^6
\]

\[
Lt = \frac{L}{60n}
\]

\[
Ls = \frac{L \cdot l}{10^6}
\]

*L: Rated fatigue life (rev)
Lt: Life in hours (h)
Ls: Life by running distance (km)
Ca: Basic dynamic load rating (N)
Fa: Axial load (N)
n: Rotational speed (min⁻¹)
l: Lead (mm)
fw: Load factor*

Conditions for attaching ball screws

With design aimed at high loads and even inner nut load distribution, NSK high-load drive ball screws have achieved high-load performance. (See page 7)

To make the most of these features, installation according to the illustration below is recommended.

The bolt holes of the installation surface in this catalog have been set on an assumption that load is received on the surface of the nut flange.

If there is drag load on the bolt for mounting ball screw, the strength of bolts should be carefully considered. Also make sure to center the ball screw with guides.

Recommended mounting direction for NSK high-load drive ball screws

Cautions regarding lubrication

When using ball screws, lubricant needs to be replenished. As time passes, lubricant and its functions deteriorate. Lubricant inside of nuts is gradually discharged by stroke motions. Also, operating environments results in impurities in lubricant. Therefore, lubricant needs to be supplemented regularly.

If high load is applied, use of load withstanding grease containing extreme pressure additives is recommended.

Operating temperature

As the temperature of ball screws rises during use, the strength of the oil film of the lubricant decreases and there is a risk of inadequate lubrication. Be sure to use them at temperatures below 70 deg C (temperature at nut diameter). Contact NSK to ask about environments and use conditions that can easily become too hot.

Other

For other information on general technology of ball screws, see the section of ball screw technical explanations in the precision product catalog (CAT. No. 3162).
**Specifications**

**Recirculation system: Equipped with SRC (Smooth Return Coupling)**

By smoothly picking up balls in the direction tangent to the screw groove, feeding speed is twice as fast as the conventional tube recirculation system while the noise is half or less.

**Allowable d·n value and feed speed**

<table>
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<th>Lead (mm)</th>
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<th>16</th>
<th>20</th>
<th>25</th>
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<tr>
<td>50</td>
<td>750</td>
<td>860</td>
<td>1,060</td>
<td>—</td>
</tr>
<tr>
<td>63</td>
<td>—</td>
<td>680</td>
<td>740</td>
<td>930</td>
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<tr>
<td>80</td>
<td>—</td>
<td>540</td>
<td>590</td>
<td>730</td>
</tr>
<tr>
<td>100</td>
<td>—</td>
<td>—</td>
<td>470</td>
<td>590</td>
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<tr>
<td>120</td>
<td>—</td>
<td>—</td>
<td>390</td>
<td>490</td>
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**Unit [mm/s]**

- **Accuracy grade**
  - C7 of JIS B 1192 (1997) is applicable as the standard accuracy grade.

- **Axial play**
  - Standard axial play: 0.020 mm or less, or 0.050 mm or less

- **Optional specs**
  - High load capacity option to increase limit axial load. See page 7 for details.
  - Consult NSK if the number of circuits is to be changed for a higher load capacity or circulation routes are to be placed on a single side.

**Design Precautions**

1) When designing the shaft ends, one end of the screw shaft must have ball groove cut through to the shaft end or the ball groove root diameter must be dr or less (see dimension chart), otherwise the ball nut cannot be installed on the screw shaft.

2) Please consult NSK with your special design requirements.

**Selection of Ball Screw**

- Please refer to pages 11 and 12 for details on the operating life of the ball screw and instructions on installation and lubrication.

- Please consult NSK in the case of a short stroke operation less than or equal to four times the length of the ball screw lead, capacity or circulation routes are to be placed on a single side.

**Operating Temperature**

- Use temperature: 70 deg C maximum (temperature at nut diameter). Use at or below 60 deg C is recommended.
NSK Ball Screws for High-Load Drive

**HTF-SRC Type**

**HTF-SRC Type Specifications**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Lead (ℓ)</th>
<th>Shaft dia. (d)</th>
<th>Root dia. (d₁)</th>
<th>Effective ball turns</th>
<th>Nut model</th>
<th>Dynamic Co. (C₀₁)</th>
<th>Static Co. (C₀₂)</th>
<th>Allowable axial load (kN)</th>
<th>Ball nut dimensions</th>
<th>Mounting (A) Recommended (B)</th>
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<td>750</td>
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<td>117</td>
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<tr>
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<td>I</td>
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<td>3430</td>
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<td>199</td>
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<td>100</td>
<td>83</td>
<td>3.5x3</td>
<td>I</td>
<td>1540</td>
<td>4580</td>
<td>159</td>
<td>199</td>
<td>40</td>
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<tr>
<td>HTF-SRC5025-10.5</td>
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<td>120</td>
<td>103</td>
<td>3.5x3</td>
<td>I</td>
<td>1300</td>
<td>4200</td>
<td>173</td>
<td>213</td>
<td>40</td>
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<tr>
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<td>I</td>
<td>1660</td>
<td>5600</td>
<td>173</td>
<td>213</td>
<td>40</td>
</tr>
</tbody>
</table>

Remarks:
1. The ball nut length with no seals is shorter by 1mm than that of a ball nut with seals.
2. Please consult NSK if load exceeds the allowable axial load (Fa max.).
3. The right hand screw is the standard. For specifications on left hand screws, consult NSK.
4. The allowable axial load is a value in the case of S clearance. If the clearance amount and mounting conditions differ, please note that the allowable axial load is also different.
HTF-SRD Type

1 Specifications

Recirculation system: Equipped with end deflector
By adopting a highly-regarded end deflector recirculation system, feeding speed of 3,000 mm/s has been achieved. There is no runout of recirculation components and a good rotation balance is ensured.

Allowable d·n value and feed speed

- d·n: 120,000 or less
- d·n: Shaft diameter d (mm) × Rotational speed (min⁻¹)

<table>
<thead>
<tr>
<th>Allowable feed speed of combinations of shaft diameter and lead</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lead (mm)</strong></td>
</tr>
<tr>
<td><strong>Shaft dia. (mm)</strong></td>
</tr>
<tr>
<td>50</td>
</tr>
<tr>
<td>63</td>
</tr>
<tr>
<td>80</td>
</tr>
<tr>
<td>100</td>
</tr>
<tr>
<td>120</td>
</tr>
</tbody>
</table>

- Standard axial play: 0.020 mm or less, or 0.050 mm or less
- Seal
  The ball nut length is shortened by the use of thin seals.
- Option
  High load capacity option to increase limit axial load. See page 7 for details. Please consult NSK if you are considering nut rotation.

2 Design Precautions

1) When designing the shaft ends, one end of the screw shaft must have ball groove cut through to the shaft end or the ball groove root diameter must be d or less (see dimension chart), otherwise the ball nut cannot be installed on the screw shaft.
2) Please consult NSK with your special design requirements.

3 Selection of Ball Screw

- Please refer to pages 11 and 12 for details on the operating life of the ball screw and instructions on installation and lubrication.
- Please consult NSK in the case of a short stroke operation less than or equal to four times the length of the ball screw lead/capacity or circulation routes are to be placed on a single side.

4 Operating Temperature

- Use temperature: 70 deg C maximum (temperature at nut diameter). Use at or below 60 deg C is recommended.
### HTF-SRD Type Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Lead</th>
<th>Shaft dia.</th>
<th>Root dia.</th>
<th>Nut model</th>
<th>Basic load rating (kN)</th>
<th>Ball nut dimensions</th>
<th>Allowable axial load (kN)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>d</td>
<td>d'</td>
<td></td>
<td>Dynamic Cₚ</td>
<td>Static Cₛ</td>
<td>D</td>
</tr>
<tr>
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<td>49</td>
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<td>292</td>
<td>590</td>
<td>140</td>
</tr>
<tr>
<td><strong>HTF-SRD5040-6E</strong></td>
<td>40</td>
<td>50</td>
<td>39</td>
<td>I</td>
<td>243</td>
<td>491</td>
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<tr>
<td><strong>HTF-SRD5040-8E</strong></td>
<td>40</td>
<td>50</td>
<td>39</td>
<td>I</td>
<td>319</td>
<td>679</td>
<td>115</td>
</tr>
<tr>
<td><strong>HTF-SRD5040-6E</strong></td>
<td>40</td>
<td>63</td>
<td>49</td>
<td>I</td>
<td>363</td>
<td>768</td>
<td>140</td>
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<td><strong>HTF-SRD5040-8E</strong></td>
<td>40</td>
<td>63</td>
<td>49</td>
<td>I</td>
<td>476</td>
<td>1,080</td>
<td>140</td>
</tr>
<tr>
<td><strong>HTF-SRD5050-6E</strong></td>
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</tr>
<tr>
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<td>I</td>
<td>319</td>
<td>679</td>
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</tr>
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<td><strong>HTF-SRD5050-6E</strong></td>
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<tr>
<td><strong>HTF-SRD5050-8E</strong></td>
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<tr>
<td><strong>HTF-SRD6360-6E</strong></td>
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<td>363</td>
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</tr>
<tr>
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<td>63</td>
<td>49</td>
<td>I</td>
<td>476</td>
<td>1,080</td>
<td>140</td>
</tr>
<tr>
<td><strong>HTF-SRD10060-8E</strong></td>
<td>100</td>
<td>100</td>
<td>83</td>
<td>I</td>
<td>583</td>
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<td>195</td>
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<tr>
<td><strong>HTF-SRD10060-8E</strong></td>
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<td>83</td>
<td>I</td>
<td>765</td>
<td>2,060</td>
<td>195</td>
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<tr>
<td><strong>HTF-SRD10060-8E</strong></td>
<td>100</td>
<td>80</td>
<td>63</td>
<td>I</td>
<td>502</td>
<td>1,180</td>
<td>175</td>
</tr>
<tr>
<td><strong>HTF-SRD10060-8E</strong></td>
<td>100</td>
<td>80</td>
<td>63</td>
<td>I</td>
<td>658</td>
<td>1,630</td>
<td>175</td>
</tr>
<tr>
<td><strong>HTF-SRD80120-4E</strong></td>
<td>120</td>
<td>80</td>
<td>63</td>
<td>I</td>
<td>337</td>
<td>751</td>
<td>175</td>
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<tr>
<td><strong>HTF-SRD120120-6E</strong></td>
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<td>120</td>
<td>103</td>
<td>I</td>
<td>826</td>
<td>2,520</td>
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</tbody>
</table>

**Remarks:**
1. Please consult NSK if load exceeds the allowable axial load (Fa max.).
2. The right hand screw is the standard. For specifications on left hand screw, contact NSK.
3. The allowable axial load is a value in the case of S clearance. If the clearance amount and mounting conditions differ, please note that the allowable axial load is also different.
4. When F and C dimensions are the same, the diameter of whole area of F dimension is φ6.0.
### 1 Specifications

#### Equipped with grease retaining A1 seal

The optimum design of the A1 seal (patent applied for and pending) allows superior grease retaining performance.

#### Recirculation system: Equipped with SRC or end deflector

These ball screws are used with the SRC or the end deflector recirculation system, which pick up balls smoothly in the direction they are moving.

#### Allowable d·n value and feed speed

<table>
<thead>
<tr>
<th>Lead (mm)</th>
<th>HTF-ASRC Type</th>
<th>HTF-ASRD Type</th>
</tr>
</thead>
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<td>50</td>
<td>860</td>
<td>—</td>
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<tr>
<td>63</td>
<td>680</td>
<td>740</td>
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<td>100</td>
<td>—</td>
<td>470</td>
</tr>
<tr>
<td>120</td>
<td>—</td>
<td>390</td>
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</table>

Unit [mm/s]

#### Accuracy grade

C7 of JIS B 1192 (1997) is applicable as the standard accuracy grade.

#### Axial play

Standard axial play: 0.020 mm or less, 0.050 mm or less

#### Option

High load capacity option to increase limit axial load. See page 7 for details.

### 2 Design Precautions

1) When designing the shaft ends, one end of the screw shaft must have ball groove cut through to the shaft end or the ball groove root diameter must be d or less (see dimension chart), otherwise the ball nut cannot be installed on the screw shaft.

2) The table below shows the maximum length of screw shaft for the equipment of the A1 seal.

3) Please contact NSK with your special design requirements.

<table>
<thead>
<tr>
<th>Shaft dia. [mm]</th>
<th>Max. shaft length [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>1 500</td>
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<tr>
<td>63</td>
<td>1 500</td>
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<tr>
<td>80</td>
<td>1 700</td>
</tr>
<tr>
<td>100, 120</td>
<td>1 900</td>
</tr>
</tbody>
</table>

### 3 Selection of Ball Screw

- Please refer to pages 11 and 12 for details on the operating life of the ball screw and instructions on installation and lubrication.
- Please consult NSK in the case of a short stroke operation less than or equal to four times the length of the ball screw lead.

### 4 Environmental Conditions

- Use temperature: 70 deg C maximum (temperature at nut diameter). Use at or below 60 deg C is recommended.
- Never use in an environment where degreasing solvents are present.
- Examples: grease-removing organic solvent such as hexane or thinner, white kerosine, rust preventive oil (containing white kerosine)
# HTF-ASRC Type

## HTF-ASRC Type Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Lead ( \tau )</th>
<th>Shaft dia. ( \phi_d )</th>
<th>Root dia. ( \phi_r )</th>
<th>Effective ball turns T x Circuits</th>
<th>Nut model</th>
<th>Basic load rating (kN)</th>
<th>Allowable axial load (kN)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dynamic ( C_	ext{d} )</td>
<td>Static ( C_	ext{b} )</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>( D ) ( A ) ( B )</td>
<td>( L ) ( W ) ( X )</td>
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<td>39</td>
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<td>I</td>
<td>383</td>
<td>818</td>
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<tr>
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<td>1050</td>
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<td>549</td>
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<td>I</td>
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<td>720</td>
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<td>I</td>
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<td>69</td>
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<td>2490</td>
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<td>I</td>
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<tr>
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<td>63</td>
<td>49</td>
<td>2.5 x 4</td>
<td>I</td>
<td>732</td>
<td>1710</td>
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<tr>
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<td>80</td>
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<td>3.5 x 4</td>
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<td>2910</td>
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<td>100</td>
<td>86</td>
<td>3.5 x 3</td>
<td>I</td>
<td>1 200</td>
<td>3890</td>
</tr>
<tr>
<td>HTF-ASRC10020-14</td>
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<td>120</td>
<td>106</td>
<td>3.5 x 4</td>
<td>I</td>
<td>1 776</td>
<td>5550</td>
</tr>
<tr>
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<td>120</td>
<td>106</td>
<td>3.5 x 3</td>
<td>I</td>
<td>1 300</td>
<td>4200</td>
</tr>
<tr>
<td>HTF-ASRC10025-14</td>
<td>25</td>
<td>120</td>
<td>106</td>
<td>3.5 x 4</td>
<td>I</td>
<td>1 660</td>
<td>5600</td>
</tr>
</tbody>
</table>

Remarks:
1. Drain holes shall be plugged for shipping.
2. The right hand screw is the standard. For specifications on left hand screws, contact NSK.
3. The allowable axial load is a value in the case of S clearance. If the clearance amount and mounting conditions differ, please note that the allowable axial load is also different.
HTF-ASRD Type Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Lead ( l )</th>
<th>Shaft dia. ( d )</th>
<th>Root dia. ( d_r )</th>
<th>Basic load rating (kN)</th>
<th>Ball nut dimensions</th>
<th>Allowable axial load (kN)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dynamic ( C_a ) Static ( C_{0a} )</td>
<td>( D ) ( A ) ( B ) ( L ) ( H ) ( W ) ( X ) ( Q ) ( T_1 ) ( T_2 ) ( S ) ( S_1 ) ( S_2 )</td>
<td>Mounting</td>
</tr>
<tr>
<td>HTF-ASRD6332-4E</td>
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<td>63</td>
<td>49</td>
<td>292 590</td>
<td>140 190 36 186 85 165 14 Rc1/8 85.1</td>
<td>-- 23.5 138 109.7 105.9</td>
</tr>
<tr>
<td>HTF-ASRD5040-6E</td>
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<td>50</td>
<td>39</td>
<td>243 491</td>
<td>115 165 34 172 72.5 140 14 Rc1/8 75.7</td>
<td>20 24 123.5 101 94.9</td>
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<td>HTF-ASRD5040-8E</td>
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<td>319 679</td>
<td>115 165 34 212 72.5 140 14 Rc1/8 95.7</td>
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</tr>
<tr>
<td>HTF-ASRD6340-6E</td>
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<td>63</td>
<td>49</td>
<td>363 768</td>
<td>140 200 36 176 90 170 18 Rc1/8 77.6</td>
<td>20 24 127.5 170 160.3</td>
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<tr>
<td>HTF-ASRD6340-8E</td>
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<td>476 1,060</td>
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<td>20 24 167.5 205.2 188.2</td>
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<td>80</td>
<td>63</td>
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<td>175 250 40 208 110 210 22 Rc1/8 91.1</td>
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<td>HTF-ASRD8050-8E</td>
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<td>658 1,630</td>
<td>175 250 40 258 110 210 22 Rc1/8 116.1</td>
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</tr>
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<td>765 2,060</td>
<td>195 270 40 299 122 235 22 Rc1/8 134.5</td>
<td>30 26 247 415.8 368.3</td>
</tr>
</tbody>
</table>

Remarks:
1. Drain holes shall be plugged for shipping.
2. The right-hand screw is the standard. For specifications on left-hand screws, contact NSK.
3. The allowable axial load is a value in the case of S clearance. If the clearance amount and mounting conditions differ, please note that the allowable axial load is also different.
HTF-SRE Type

Specifications

1. Recirculation system: picking up balls in the direction tangent to deflector
   By smoothly picking up balls in the direction of the screw groove tangent, feeding speed is 1.4 to 2 times as fast as the conventional tube recirculation system.

2. Allowable d-n value
   Allowable d-n value: shaft diameter d [mm] \( \times \) rotations n [min\(^{-1}\)]
   
<table>
<thead>
<tr>
<th>Allowable feed speed of combinations of shaft diameter and lead</th>
<th>Unit [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shaft dia.</td>
<td>25</td>
</tr>
<tr>
<td>140</td>
<td>714</td>
</tr>
<tr>
<td>160</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td></td>
</tr>
</tbody>
</table>

3. Design Precautions
   1) When designing the shaft ends, one end of the screw shaft must have ball groove cut through to the shaft end or the ball groove root diameter must be \( d r \) or less (see dimension chart), otherwise the ball nut cannot be installed on the screw shaft.
   2) Please consult NSK with your special design requirements.

Accuracy grade
   C7 of JIS B 1192 (1997) is applicable as the standard accuracy grade.

Axial play
   Standard axial play: 0.050 mm or less

Option
   • High load capacity option to increase limit axial load. See page 7 for details.
   • Consult NSK if the number of circuits is to be changed for a higher load capacity or circulation routes are to be placed on a single side.

Selection of Ball Screw
   • Please refer to pages 11 and 12 for details on the operating life of the ball screw and instructions on installation and lubrication.
   • Please consult NSK in the case of a short stroke operation less than or equal to four times the length of the ball screw lead capacity or circulation routes are to be placed on a single side.

Operating Temperature
   • Use temperature: 70 deg C maximum (temperature at nut diameter).

• Please consult NSK about ball nut shape and dimensions.
• A double-screw can be used for leads of 90mm and more.
## Specifications

### Allowable d·n value and feed speed

<table>
<thead>
<tr>
<th>Load</th>
<th>20 mm or less</th>
<th>25 mm</th>
<th>30 to 32 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>≦ 70 000</td>
<td>≦ 70 000</td>
<td>≦ 50 000</td>
</tr>
<tr>
<td>High-speed</td>
<td>≦ 100 000</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

\[ d·n = \text{Shaft diameter (mm)} \times \text{Rotational speed (mm/s)} \]

For even faster specs, HTF-SRC is recommended (See pages 13–16 for details).

### Accurate play

C7 of JIS B 1192 (1997) is applicable as the standard accuracy grade.

### Axial play

Standard axial play: 0.020 mm or less, or 0.050 mm or less

### Optional specs

- High load capacity option to increase limit axial load.  
  See page 7 for details.  
- Consult NSK if the number of circuits is to be changed for a higher load capacity or circulation routes are to be placed on a single side.

### Design Precautions

1. When designing the shaft ends, one end of the screw shaft must have a ball groove cut through to the shaft end or the ball groove root diameter must be 0.6 or less (see dimension chart), otherwise the ball nut cannot be installed on the screw shaft.  
2. Please consult NSK with your special design requirements.

### Selection of Ball Screw

- Please refer to pages 11 and 12 for details on the operating life of the ball screw and instructions on installation and lubrication.  
- Please consult NSK in the case of a short stroke operation less than or equal to four times the length of the ball screw lead.

### Operating Temperature

- Use temperature: 70 deg C maximum (temperature at nut diameter)

---

Leads with a diameter of 20 mm or less have high-speed feeding specs.
Remarks:
1. The ball nut length with no seals is shorter by M than that of a ball nut with seals.
2. Please consult NSK if load exceeds the allowable axial load (Fa max.).
3. The right hand screw is the standard. For specifications on left hand screws, contact NSK.
4. The allowable axial load is a value in the case of S clearance. If the clearance amount and mounting conditions differ, please note that the allowable axial load is also different.
**HTF Type**

**Outline drawing**

- **Nut model II**
- **Nut model III**

**HTF Type Specifications**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Lead ( \ell )</th>
<th>Shaft dia. ( d )</th>
<th>Root dia. ( d_1 )</th>
<th>Effective ball turns ( \times ) Circuits</th>
<th>Nut model</th>
<th>Basic load rating ( [\text{kN}] )</th>
<th>Ball nut dimensions</th>
<th>Allowable axial load ( [\text{kN}] )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \ell )</td>
<td>( d )</td>
<td>( d_1 )</td>
<td>( \times )</td>
<td></td>
<td></td>
<td></td>
<td>Mounting</td>
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<td></td>
<td></td>
<td>( T_1 )</td>
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<tr>
<td>HTF5014-7.5</td>
<td>14</td>
<td>50</td>
<td>41.7</td>
<td>2.5( \times )3</td>
<td>II</td>
<td>264</td>
<td>623</td>
<td>80</td>
</tr>
<tr>
<td>HTF5514-7.5</td>
<td>14</td>
<td>55</td>
<td>46.7</td>
<td>2.5( \times )3</td>
<td>II</td>
<td>270</td>
<td>696</td>
<td>85</td>
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<tr>
<td>HTF6314-7.5</td>
<td>14</td>
<td>63</td>
<td>54.7</td>
<td>2.5( \times )3</td>
<td>II</td>
<td>291</td>
<td>800</td>
<td>94</td>
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<tr>
<td>HTF6314-10</td>
<td>14</td>
<td>63</td>
<td>54.7</td>
<td>2.5( \times )4</td>
<td>II</td>
<td>327</td>
<td>1,020</td>
<td>116</td>
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<tr>
<td>HTF8014-7.5</td>
<td>14</td>
<td>80</td>
<td>71.7</td>
<td>2.5( \times )3</td>
<td>II</td>
<td>418</td>
<td>1,360</td>
<td>116</td>
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<tr>
<td>HTF8014-10</td>
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<td>80</td>
<td>71.7</td>
<td>2.5( \times )4</td>
<td>II</td>
<td>483</td>
<td>1,818</td>
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<tr>
<td>HTF10016-7.5</td>
<td>16</td>
<td>55</td>
<td>44</td>
<td>2.5( \times )3</td>
<td>II</td>
<td>399</td>
<td>922</td>
<td>99</td>
</tr>
<tr>
<td>HTF10016-10</td>
<td>16</td>
<td>63</td>
<td>52</td>
<td>2.5( \times )3</td>
<td>II</td>
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<tr>
<td>HTF12016-7.5</td>
<td>16</td>
<td>63</td>
<td>52</td>
<td>2.5( \times )4</td>
<td>II</td>
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<td>1,410</td>
<td>105</td>
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<tr>
<td>HTF12016-10</td>
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<td>63</td>
<td>52</td>
<td>2.5( \times )4</td>
<td>II</td>
<td>562</td>
<td>1,450</td>
<td>105</td>
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<tr>
<td>HTF12016-10.5</td>
<td>16</td>
<td>63</td>
<td>52</td>
<td>3.5( \times )3</td>
<td>II</td>
<td>720</td>
<td>1,900</td>
<td>105</td>
</tr>
<tr>
<td>HTF12016-14</td>
<td>16</td>
<td>63</td>
<td>52</td>
<td>3.5( \times )4</td>
<td>II</td>
<td>720</td>
<td>1,900</td>
<td>105</td>
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<tr>
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<td>80</td>
<td>69</td>
<td>2.5( \times )3</td>
<td>II</td>
<td>478</td>
<td>1,340</td>
<td>120</td>
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<tr>
<td>HTF16016-10</td>
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<td>80</td>
<td>69</td>
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<td>II</td>
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<td>16</td>
<td>80</td>
<td>69</td>
<td>3.5( \times )4</td>
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<td>802</td>
<td>2,490</td>
<td>120</td>
</tr>
<tr>
<td>HTF10016-7.5</td>
<td>16</td>
<td>100</td>
<td>89</td>
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<td>1,710</td>
<td>145</td>
</tr>
<tr>
<td>HTF10016-10</td>
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<td>100</td>
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<td>2.5( \times )4</td>
<td>II</td>
<td>677</td>
<td>2,280</td>
<td>145</td>
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<tr>
<td>HTF10016-10.5</td>
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<td>120</td>
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<tr>
<td>HTF10016-14</td>
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<td>100</td>
<td>89</td>
<td>3.5( \times )3</td>
<td>II</td>
<td>802</td>
<td>2,490</td>
<td>120</td>
</tr>
</tbody>
</table>

**Remarks:**
1. The ball nut length with no seals is shorter by \( M \) than that of a ball nut with seals.
2. Please consult NSK if load exceeds the allowable axial load \( F_{a \text{max.}} \).
3. The right hand screw is the standard. For specifications on left hand screws, contact NSK.
4. The allowable axial load is a value in the case of \( S \) clearance. If the clearance amount and mounting conditions differ, please note that the allowable axial load is also different.
**HTF Type**

**HTF Type Specifications**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Lead (S)</th>
<th>Shaft dia. (α)</th>
<th>Root dia. (d)</th>
<th>Effective ball turns (T) x Circuits</th>
<th>Nut model</th>
<th>Basic load rating (kN)</th>
<th>Ball nut dimensions</th>
<th>Allowable axial load (kN)</th>
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</thead>
<tbody>
<tr>
<td>HTF12020-7.5</td>
<td>20</td>
<td>100</td>
<td>86</td>
<td>2.5 x 3</td>
<td>II</td>
<td>775</td>
<td>D: 117 A: 157 B: 32 L: 281 M: 193 W: 111 X: 130 V: 223 Dh: 108 Q: 9/8</td>
<td>479.9 (364.9)</td>
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<tr>
<td>HTF12020-12</td>
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<td>100</td>
<td>86</td>
<td>3.5 x 3</td>
<td>II</td>
<td>1,020</td>
<td>D: 117 A: 157 B: 32 L: 341 M: 193 W: 111 X: 130 V: 223 Dh: 108 Q: 9/8</td>
<td>615.8 (422.6)</td>
</tr>
</tbody>
</table>

**Remarks:**
1. The ball nut length with no seal is shorter by M than that of a ball nut with seals.
2. Please consult NSK if load exceeds the allowable axial load (Fx max.).
3. The right-hand screws are the standard. For specifications on left-hand screws, contact NSK.
4. The allowable axial load is a value in case of S clearance. If the clearance amount and mounting conditions differ, please note that the allowable axial load is also different.
# HTF Type

## HTF Type Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Lead (P)</th>
<th>Shaft dia. (d)</th>
<th>Root dia. (d₁)</th>
<th>Effective ball turns per Circuits</th>
<th>Nut model</th>
<th>Basic load rating [kN]</th>
<th>Ball nut dimensions</th>
<th>Allowable axial load [kN]</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dynamic Cₚₙ</td>
<td>Static C₀ₚₙ</td>
<td>D</td>
</tr>
<tr>
<td>HTF14030-7.5</td>
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<td>140</td>
<td>121</td>
<td>2.5×3</td>
<td>II</td>
<td>1310</td>
<td>4110</td>
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<td>HTF14030-10</td>
<td>30</td>
<td>140</td>
<td>121</td>
<td>2.5×4</td>
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<td>5490</td>
<td>222</td>
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<td>HTF14030-10</td>
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<td>140</td>
<td>121</td>
<td>3.5×3</td>
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<td>1710</td>
<td>5710</td>
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<td>HTF16030-7.5</td>
<td>30</td>
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<td>141</td>
<td>2.5×3</td>
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<td>HTF16030-10</td>
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<td>160</td>
<td>141</td>
<td>2.5×4</td>
<td>III</td>
<td>1790</td>
<td>6340</td>
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<td>HTF16030-10.5</td>
<td>30</td>
<td>160</td>
<td>141</td>
<td>3.5×3</td>
<td>II</td>
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<tr>
<td>HTF20030-7.5</td>
<td>30</td>
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<td>181</td>
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<tr>
<td>HTF20030-10</td>
<td>30</td>
<td>200</td>
<td>181</td>
<td>2.5×4</td>
<td>III</td>
<td>1980</td>
<td>7950</td>
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</tr>
<tr>
<td>HTF20030-10</td>
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<td>200</td>
<td>181</td>
<td>3.5×3</td>
<td>III</td>
<td>2080</td>
<td>8420</td>
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</tr>
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<td>HTF20032-7.5</td>
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<td>200</td>
<td>178</td>
<td>2.5×3</td>
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<td>1680</td>
<td>5370</td>
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</tr>
<tr>
<td>HTF20032-10</td>
<td>32</td>
<td>200</td>
<td>178</td>
<td>2.5×4</td>
<td>III</td>
<td>2130</td>
<td>7160</td>
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<tr>
<td>HTF20032-10</td>
<td>32</td>
<td>200</td>
<td>178</td>
<td>3.5×3</td>
<td>III</td>
<td>2180</td>
<td>7460</td>
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</tr>
<tr>
<td>HTF20032-10</td>
<td>32</td>
<td>200</td>
<td>178</td>
<td>3.5×4</td>
<td>III</td>
<td>2380</td>
<td>9120</td>
<td>290</td>
</tr>
</tbody>
</table>

Remarks:
1. The ball nut length with no seals is shorter by M than that of a ball nut with seals.
2. Please consult NSK if load exceeds the allowable axial load (Fa max.).
3. The right hand screw is the standard. For specifications on left hand screws, contact NSK.
4. The allowable axial load is a value in the case of S clearance. If the clearance amount and mounting conditions differ, please note that the allowable axial load is also different.
NSKHPS™
Angular Contact Thrust Ball Bearings of Ball Screw Support Bearings for High-Load Drive Applications

High-capacity bearings used for supporting ball screws operating under high loads typically adopt large-diameter steel balls in order to ensure sufficient high capacity and to reduce the number of rows of combinations. With the development and commercialization of the special bore diameter series, which has the same load rating as that of the standard series but with a smaller bore diameter, users can maintain equivalent high-capacity performance with a smaller diameter of screw shaft end without changing the number of rows. Please refer to pages 41 and 42 for applicable bearing tables.

Extended bearing life and higher axial-load capacity

- Special bore diameter series facilitates increasing load capacity of coaxial diameter and downscaling screw shaft end.
- Easy handling by means of universal matching

Extended bearing life and higher axial-load capacity

The Special Bore Series are Standard Series bearings of the next larger size with only their bore reduced in size, permitting higher load capacity with the same shaft diameter as well as more compact screw shaft ends.

Formulation of Bearing Numbers

<table>
<thead>
<tr>
<th>Standard series</th>
<th>Special bore diameter series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bearing type symbol</td>
<td>Bearing type symbol</td>
</tr>
<tr>
<td>Bearing bore diameter</td>
<td>Bearing bore diameter</td>
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<tr>
<td>Dimension symbol</td>
<td>Dimension symbol</td>
</tr>
<tr>
<td>Internal design symbol</td>
<td>Internal design symbol</td>
</tr>
<tr>
<td>Cage symbol</td>
<td>Cage symbol</td>
</tr>
<tr>
<td>Preload symbol</td>
<td>Preload symbol</td>
</tr>
<tr>
<td>Arrangement symbol</td>
<td>Arrangement symbol</td>
</tr>
</tbody>
</table>

Example:

- **Standard series**
  - 60TAC03: 60 bore diameter, TAC type symbol, 03 dimension symbol, SU internal design symbol, T85 cage symbol, PN5D accuracy symbol.

- **Special bore diameter series**
  - 60TAC03-6: 60 bore diameter, TAC type symbol, 03 dimension symbol, SU internal design symbol, T85 cage symbol, PN5D accuracy symbol.

References:

- NSK Ball Screws for High-Load Drive

---

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NSKTAC Series of Ball Screw Support Bearings for High-Load Applications

Multi-row combination calculations
Calculation of preload, axial rigidity and starting torque for bearing arrangements

Multiply by factors in table B.

Table B

<table>
<thead>
<tr>
<th>Number of load-</th>
<th>2 rows</th>
<th>3 rows</th>
<th>4 rows</th>
<th>5 rows</th>
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<tbody>
<tr>
<td>sustaining rows</td>
<td>DFD</td>
<td>DFF</td>
<td>DFT</td>
<td>DFFF</td>
</tr>
<tr>
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<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td></td>
<td>DBD</td>
<td>DBB</td>
<td>DBT</td>
<td>DBBD</td>
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<td>DBF</td>
<td>DBFF</td>
<td>DBFT</td>
<td>DBT</td>
</tr>
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<td></td>
<td>DBTD</td>
<td>DBB</td>
<td>DBTT</td>
<td>DBTD</td>
</tr>
<tr>
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<tr>
<td>Axial rigidity</td>
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<td>2.00</td>
<td>1.89</td>
<td>2.61</td>
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<tr>
<td>Starting torque</td>
<td>1.35</td>
<td>2.00</td>
<td>1.55</td>
<td>2.41</td>
</tr>
</tbody>
</table>

Dynamic equivalent load
Angular contact thrust ball bearings for equipment such as electric injection molding machines are subjected to extremely large axial loads ($F_a$) in comparison to radial loads ($F_r$). Therefore, the dynamic equivalent load $P$ of the support bearing is obtained by the following formula regardless of the number of rows: $P = 0.89 \times F_a + P_r$.

Note:
1. An asterisk (*) indicates bearings that are also available equipped with screw holes for mounting bolts.
2. Limiting speeds are based on the standard preload of each bearing. The values shown are valid for all types of bearing arrangement.
3. Boundary dimensions are shown as the sum of bearing outer diameter and mounting hole center distance for each series of bearing arrangement.
4. The starting torque values in the table apply to grease lubrication.
5. To calculate permissible axial load, multiplypreload factor by 0.7.
6. When it is used under the condition that impact load is applied, brac cage is recommended. Please consult NSK.
NSK Roller Guides RA Series

The RA series’ roller guides feature high-load capacity and high rigidity and help to preserve the working environment. This series is the culmination of NSK’s analysis technology and tribology.

High-load capacity

The world’s highest-load capacity, taking full advantage of NSK’s analysis technology, ensures a long operating life.

High rigidity

The optimum size of the roller ensures high rigidity and supports more compact machinery.

Highly dust-resistant design

The high performance seals as standard equipment completely block the entry of foreign matter and maintain primary performance over the long time.

Interchangeable series

The interchangeable series of the guide rails and the roller slides are independently available in stock.

Specifications

Roller Slide Types and Shapes

- Two types of roller slides are available in this series: a flange type and a square type.
- A compact, low-profile square type is now available.
- On the mounting hole of the flange type, the tapped part is used to fix the roller slide from the top surface, and the minor diameter can be used as a bolt hole from the bottom. This provides mounting from both directions, top and bottom.
- Roller slide length can be specified by the standard high-load type or special long, super-high load type.

Fig. 1 Square type (RA15, 20, 25, 30, 35, 45, 55, and 65) Roller slide shape code

Fig. 2 Low-profile type (RA15, 25, 30, 35, 45, and 55) Roller slide shape code

Fig. 3 Flange type (RA15, 20, 25, 30, 35, 45, 55, and 65) Roller slide shape code

Please refer to Cat. No. E3328 for more details.
Technical Data Sheet for NSK High-Load Drive Ball Screw

Custom-made ball screw

Company name: Date: 
NSK sales office

Section: Person in charge: 
Name of machine*: 
Company name: Date: 
Section: Person in charge: 
Address: 
Name of machine*: 
Company name: Date: 
Section: Person in charge: 

1. Use conditions

Operating conditions
- Shaft rotation−Moving nut
- Shaft rotation−Moving shaft
- Nut rotation−Moving nut
- Nut rotation−Moving shaft
- Oscillation

Direction of load*: 
- C−C
- T−T
- C−T
- T−C
- Other

Mounting orientation: 
- Horizontal
- Vertical (indicate the direction of gravity)

Lubricant: 
- Grease
- Brand name:
- Oil
- Maker: 
How to replenish lubricant: 
- Grease gun
- Automatic

Request for oil hole: 
- NSK recommended
- Your request

Necessity of seals: 
- Yes
- No
- NSK S1 necessary?
- NSK recommended
- Not necessary

Environment
- Temperature (°C): 
- Particles / No particle
- Size of particle: 
- Ingredient: 

Surface treatment: 
- Not required
- Low-temperature chrome plating
- Fluoride low-temperature chrome plating
- Other

Quantity in mass-production 
- /Month
- /Year
- /Lot
- Quantity used per machine

* Please specify loading direction code on the figures below. (Shaft fixed: C, Main load: T)

2. Specifications

Shaft diameter: 
- 63 mm
- 15 mm
- 10 mm

Load: 
- Accuracy grade: 
- C/T
- Axial play: 
- 0.050 or less
- 800 / 1200 mm max.

Model No. 
- HTF-ARC 63317-7.5-ST
- Effective turns of balls: 
- Direction of turn: 
- Right
- Thread length / Overall shaft length: 

Special note / Requests:

3. Load chart (If using multiple ball screws in an axis, fill out the axial load per ball screw.)

4. Plan to conduct the endurance test of the ball screw?

Actual data on the machine

Planning to check endurance (Date: From the middle of March 20XX)

Endurance of the ball screw

(1) Mounting accuracy, load conditions, and lubricating conditions are the main factors affecting the ball screw fatigue life. Therefore, we recommend evaluating the influence of those factors on actual use of your machines.

(2) A temperature rise caused by operational and environmental conditions may reduce the effectiveness of lubricant.
Technical Data Sheet for NSK High-Load Drive Ball Screw

1. Use conditions

- **Operating conditions**: Shaft rotation—Moving nut, Shaft rotation—Moving shaft, Nut rotation—Moving nut, Nut rotation—Moving shaft, Oscillation
- **Degree of vibration / impact**: Normal operation, Back drive operation, Operation associated with impact of vibration
- **Mounting orientation**: Horizontal, Vertical (indicate the direction of gravity)
- **Lubricant**: Grease, Oil, Brand name, Maker
- **How to replenish lubricant**: Grease gun, Automatic (cm³ / cycles)
- **Environment**: Temperature, Particles / No particle
- **Surface treatment**: Required, Low-temperature chrome plating, Fluoride low-temperature chrome plating, Other

2. Specifications

- **Shaft diameter**: d mm
- **Thread length / Overall shaft length**: mm
- **Accuracy grades**: A
- **Axial play**: mm max
- **Axial load**: F (kN)
- **Rotational speed**: N (min⁻¹)
- **Average speed**: V (mm/s)
- **Time**: t (s)

3. Load chart (If using multiple ball screws in an axis, fill out the axial load per ball screw.)

4. Plan to conduct the endurance test of the ball screw?

- **Actual data on the machine**: Yes, Planning to check endurance (Date: )
- **Endurance of the ball screw**:
  - Mounting accuracy, load conditions, and lubricating conditions are the main factors affecting the ball screw fatigue life. Therefore, we recommend evaluating the influence of those factors on actual use of your machine.
  - A temperature rise caused by operational and environmental conditions may reduce the effectiveness of lubricant.
Worldwide Sales Offices

NSK LTD. HEADQUARTERS, TOKYO JAPAN
Industrial Machinery Business Division Headquarters
Automotive Business Division Headquarters
P: +81-3-3779-7227
P: +81-3-3779-7189

AfricA
South Africa:
NSK SOUTH AFRICA (PTY) LTD.
SANDTON
P: +27-11-458-3600

Asia and Oceania
Australia:
NSK AUSTRALIA PTY. LTD.
MELBOURNE
P: +61-3-9765-4400
SYDNEY
P: +61-2-9839-2300
BRISBANE
P: +61-7-3347-2600
PERTH
P: +61-8-9256-5000

New Zealand:
NSK NEW ZEALAND LTD.
AUCKLAND
P: +64-9-276-4992

China:
NSK (SHANGHAI) TRADING CO., LTD.
JiangSu
P: +86-21-6796-3000

NSK (CHINA) INVESTMENT CO., LTD.
JiangSu
P: +86-10-8608-8161
TIAN JIN
P: +86-22-8319-5030
CHANGCHUN
P: +86-431-8988-6982
SHEYANG
P: +86-24-2334-2668
DALIAN
P: +86-411-8800-8168
NANJING
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Fuzhou
P: +86-591-8380-1030
Wuhan
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QingDao
P: +86-532-5568-3871
Guangzhou
P: +86-20-3817-7800
ChangSHA
P: +86-731-8671-3100
LUoyang
P: +86-379-6069-6186
Xi’an
P: +86-29-8765-1896
ChongQing
P: +86-23-6806-5310
ChengDu
P: +86-28-6528-3680

NSK CHINA SALES CO., LTD.
JiangSu
P: +86-10-6796-3000

NSK HONG KONG LTD.
HONG KONG
P: +852-2739-9933
SHENZHEN
P: +86-755-2305-4886

Taiwan:
TAWAII NSK PRECISION CO., LTD.
TAEPE
P: +886-2-2509-3305
TAICHUNG
P: +886-4-2708-3339
TAINAN
P: +886-6-505-5861

India:
NSK INDIA SALES CO.PVT.LTD.
CHENNAI
P: +91-44-2847-9600
DELHI
P: +91-114-4839000

Mumbai
P: +91-22-2838-7787
Indonesia:
PT. NSK INDONESIA
JAKARTA
P: +62-21-252-3458
Korea:
NSK KOREA CO., LTD.
SEOUL
P: +82-2-3287-0300
Malaysia:
NSK BEARINGS (MALAYSIA) SDN.BHD.
SHAH ALAM
P: +60-3-7803-8859
JOHOR BAHRU
P: +60-3-3546290
POH
P: +60-5-2555000

Philippines:
NSK REPRESENTATIVE OFFICE
MANILA
P: +63-2-893-9543

Singapore:
NSK INTERNATIONAL (SINGAPORE) PTE LTD.
SINGAPORE
P: +65-6946-8000
NSK SINGAPORE (PRIVATE) LTD.
SINGAPORE
P: +65-6496-8000

Taiwan:
NSK REPRESENTATIVE OFFICE
TAIPEI
P: +886-2-2708-3393
TAICHUNG
P: +886-4-2358-2945
TAINAN
P: +886-6-505-5861

NSK KOREA (CHINA) INVESTMENT CO., LTD.
JiangSu
P: +86-21-252-3458

NSK SINGAPORE (PRIVATE) LTD.
SINGAPORE
P: +65-6496-8000

North and South America
United States of America:
NSK AMERICAS, INC. (AMERICAN HEADQUARTERS)
ANorr ARBOR
P: +1-734-913-7500

Canada:
NSK CANADA INC.
TORONTO
P: +1-905-890-0740
MONTREAL
P: +1-514-633-1220
VANCOUVER
P: +1-877-994-6675

Argentina:
NSK ARGENTINA SRL
BUENOS AIRES
P: +54-11-4704-5100

Brazil:
NSK BRASIL LTDA.
SAO PAULO
P: +55-11-3269-4700
BELO HORIZONTE
P: +55-31-3274-2951
JOINVILLE
P: +55-47-3422-2239
PORTO ALEGRE
P: +55-51-3346-7851
REDIFE
P: +55-81-3262-3781

Peru:
NSK PERU S.A.C.
LIMA
P: +51-1-493-4385

Mexico:
NSK RODAMIENTOS MEXICANA, S.A. DE C.V.
MEXICO CITY
P: +52-55-3682-3000
MONTERREY
P: +52-81-800-7300

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www.nsk.com

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For more information about NSK products, please contact:

SPain:
NSK SPAIN S.A.
BARCELONA
P: +34-93-289-2763

Turkey:
NSK RULMANLARI ORTA DOGU TIC. LTD. STI.
ISTANBUL
P: +90-216-477-7111

United Arab Emirates:
NSK BEARINGS GULF TRADING CO.
DUBAI
P: +971-4-804-8207

For the latest information, please refer to the NSK website.

www.nsk.com

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