

Tapered Roller Bearings

Load direction, arrangement, adjustment and RFQ guide

For applications where radial load and axial load must be considered together.

What this guide helps you do

Tapered roller bearings use tapered rolling contacts and are commonly arranged to support combined radial and axial loads. Many arrangements require a paired bearing system and controlled internal setting. Selection therefore involves more than matching the bearing number: shaft arrangement, direction of thrust, adjustment method, temperature and lubrication all matter.

At a glance

Question	Why it matters
What is the application?	Defines load direction, duty cycle, environment and required life.
What is the complete arrangement?	Bearing, shaft, housing, seals, lubricant and mounting structure work together.
What must be confirmed before ordering?	Full designation, dimensions, load/speed conditions and approved technical data.

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Prepared for engineering review and RFQ preparation. It is not a released product drawing, guaranteed rating, certificate or substitute for the selected manufacturer's catalogue.

Luoyang EIM Bearing Co., Ltd.
Website: www.eimbearing.com
Email: service@eimbearing.com
Tel: +86 379 6991 5786

1. Understand the bearing arrangement

Start by defining the function the bearing must perform. Similar-looking bearings can differ in load direction, stiffness, speed capability, mounting requirements and maintenance needs.

Application fit

- **Single-row bearings:** Often support combined loads with axial capacity in one direction; paired arrangements may be required for axial load in both directions.
- **Paired arrangements:** Face-to-face, back-to-back or tandem arrangements behave differently in stiffness and load distribution. Confirm the intended arrangement and adjustment method.
- **Applications:** Vehicle hubs, gearboxes, industrial drives, agricultural equipment and machinery where combined loads occur.

Design variants to compare

Configuration / feature	Selection notes
Single row	Requires a clear understanding of axial load direction and whether a second bearing provides the opposing reaction.
Matched pairs	Supplied or assembled as a pair where matched geometry or setting is required. Confirm pairing requirements before ordering.
Cup and cone	Some designs separate the outer ring (cup) from the inner ring/rollers (cone). Preserve pairing and traceability when specified.
Preload or endplay	The correct setting depends on design, load, temperature and manufacturer procedure; generic adjustment values should not be applied.

Do not compare price or nominal size until the configuration, suffixes and interface dimensions are aligned. If a part is replacing an existing bearing, use the complete designation and drawing rather than appearance alone.

2. Selection inputs and interface checks

The table below is a working checklist. Record known values and mark unknown values for confirmation before quotation or engineering approval.

Input	What to provide / verify
Load direction	Radial load, axial thrust in each direction, shock and combined load cases.
Arrangement	Single or paired bearings, orientation, spacer design, shaft shoulder and housing geometry.
Setting	Target preload/endplay or adjustment procedure, thermal growth and operating temperature.
Dimensions	Bore, cup outside diameter, total width, cone/cup numbers and mating-part dimensions.
Lubrication	Grease or oil, viscosity, supply method, contamination and operating speed.
Life and reliability	Duty cycle, load spectrum, speed, target life and maintenance expectations.

Questions to resolve before approval

- Are loads steady, intermittent, reversing or shock-loaded?
- Is the stated speed continuous, peak, or a short-duration value?
- Are shaft and housing fits, shoulders and support stiffness known?
- Will temperature, lubricant or sealing requirements change during operation?
- Is interchangeability required, and what drawing or source confirms it?

When data are missing, state the assumption explicitly. Do not turn an unknown load, speed, clearance or preload into an invented numerical value.

3. Installation, lubrication and maintenance

Many early bearing failures are associated with contamination, poor fits, misalignment, inappropriate lubrication or installation damage. Follow the selected product’s installation instructions and document the final setting where relevant.

Installation checklist

- Keep cup and cone components clean and paired where the supplier specifies matched sets. Avoid mixing parts from different sets.
- Check shaft and housing seats, shoulders, spacers and abutment faces before assembly.
- Set preload or endplay using the specified measurement method and product instructions. Do not rely only on subjective hand feel.
- Use the correct lubricant and quantity; excessive grease or inadequate oil supply can both cause problems.
- After run-in, verify temperature, noise, endplay/preload behaviour and lubricant condition under representative load.

Symptom-to-check guide

Observed symptom	First checks
High operating temperature	Check excessive preload, insufficient lubricant, incorrect viscosity, excessive load and misalignment.
Uneven raceway wear	Review alignment, shaft/housing seat geometry, load distribution and adjustment.
Roller end/rib distress	Check lubrication, axial load, speed, setting and the condition of contact surfaces.
Spalling or flaking	Investigate fatigue loading, contamination, poor lubrication, misalignment and installation damage.
Unstable endplay	Check spacer dimensions, seating, thermal effects, fastener retention and adjustment procedure.

Record the operating condition when a symptom appears: load, speed, temperature, noise/vibration, lubrication state, recent maintenance and any change to the surrounding structure. This information helps separate a bearing issue from an installation or system issue.

4. RFQ checklist — send the right information

A complete RFQ reduces clarification cycles and helps the supplier check whether the requested bearing and arrangement match the application. Provide drawings or photos where dimensions and interfaces are difficult to describe.

- Complete cup and cone designations; indicate whether a matched pair is required.
- Radial and axial loads in both directions, speed, shock and duty cycle.
- Mounting arrangement, shaft/housing drawings, spacer dimensions and shoulder geometry.
- Required preload/endplay and the approved method for setting or measuring it.
- Lubrication type, operating temperature, contamination and maintenance interval.
- Target life, noise/vibration requirements, inspection documents and traceability.
- Quantity, packaging and delivery destination.

Suggested RFQ email structure

Field	Your information
Product / full designation	_____
Quantity and annual demand	_____
Application / equipment	_____
Loads, speed and duty cycle	_____
Dimensions / drawing number	_____
Operating environment / lubricant	_____
Quality documents / inspection	_____
Delivery destination / target date	_____

Need help confirming a designation or a substitution? Send the full model number, drawing, quantity and operating conditions to service@eimbearing.com or visit www.eimbearing.com.

5. Technical boundaries and final verification

This document provides general selection and procurement guidance. It does not provide product-specific rated loads, fatigue-life guarantees, maximum speeds, permissible misalignment, preload values, fit tolerances or installation torque unless those values are stated in an approved drawing or product-specific data sheet.

Before release to production

- Confirm the full bearing designation, suffixes and dimensional drawing.
- Confirm the source and revision of any load, speed, life or precision rating used in calculations.
- Verify the bearing, shaft, housing, seals, lubricant and mounting fasteners as a complete system.
- Record any deviations, substitutions and approval responsibilities.
- Follow the supplier's current installation, lubrication and maintenance instructions.

Important note

Catalogue values and suffix meanings may vary by manufacturer and product family. Where a guide describes a general bearing arrangement, it should not be interpreted as proof that two products are interchangeable. Confirm final technical suitability with the applicable product drawing and written supplier confirmation.

Contact EIM Bearing

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