

Cylindrical Roller Bearings

Radial capacity, locating strategy and fit selection guide

Choose the internal design and shaft-location strategy together.

What this guide helps you do

Cylindrical roller bearings are commonly used where substantial radial load capacity and stiffness are needed. Different flange arrangements determine whether a bearing can accommodate axial displacement internally, support axial load, or locate a shaft. The complete bearing arrangement—not just the bearing itself—must define how the shaft is located.

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.

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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

- **High radial load:** Roller-line contact provides a large load-carrying contact area, but capacity and speed remain dependent on design, lubrication and alignment.
- **Axial displacement:** Some designs permit axial displacement within the bearing; others provide axial location in one or both directions. Confirm the exact type.
- **Applications:** Electric motors, gearboxes, pumps, compressors and industrial machinery where radial load and shaft guidance are important.

Design variants to compare

Configuration / feature	Selection notes
NU / N-type arrangements	Commonly used where axial displacement is required within the bearing; verify exact flange design and catalogue definition.
NJ / NF-type arrangements	May provide axial location in one direction depending on the design; check the manufacturer's configuration.
NUP / paired locating arrangements	Can provide axial location in both directions in suitable designs; exact components and assembly must be confirmed.
Full-complement vs. caged	Rolling-element count, friction, speed and lubrication requirements differ. Do not substitute without checking ratings and operating conditions.

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
Radial load	Magnitude, direction, shock, load spectrum and required stiffness.
Axial location	Identify which bearing locates the shaft, which permits expansion, and how thrust is reacted.
Speed and lubrication	Speed range, oil/grease method, viscosity, cooling and replenishment.
Alignment	Shaft/housing coaxiality, deflection, seat geometry and permissible misalignment.
Fit and clearance	Interference fit, operating clearance, thermal gradients and shaft expansion.
Design envelope	Bore, outside diameter, width, shoulders, flange arrangement and cage constraints.

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

- Inspect roller tracks, flanges and cage for handling damage. Keep components clean during assembly.
- Check the shaft and housing seats, shoulder radii and abutment faces against the drawing.
- Apply mounting force through the ring being fitted; avoid loading the rollers during installation.
- Confirm the intended locating/floating arrangement so thermal expansion does not create unwanted axial preload.
- Use the specified lubricant and monitor temperature, vibration and axial movement after installation.

Symptom-to-check guide

Observed symptom	First checks
High temperature	Check lubricant supply, excessive interference, inadequate operating clearance, speed and axial constraint.
Roller skew or edge wear	Review alignment, shaft/housing deflection, loading, lubrication and internal design selection.
Flange damage	Check axial load direction, lubrication at flange/roller-end contacts, setting and misalignment.
Unexpected axial load	Verify the floating/locating arrangement and thermal expansion path.
Vibration or noise	Check contamination, roller/raceway damage, fits, alignment and lubrication.

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.

- Full designation and suffix, including cage or full-complement version.
- Radial load, axial load, speed, duty cycle and required service life.
- Required shaft location: floating, locating one direction or locating both directions.
- Shaft/housing drawings, fits, shoulders, fillet radii and alignment limits.
- Operating temperature, thermal expansion, lubrication method and contamination.
- Required clearance, precision, vibration/noise limits and inspection documents.
- Quantity, traceability, 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.

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