

Suitability of rolling bearings for industrial applications

Symbols

- +++ excellent
- ++ good
- + fair
- poor
- unsuitable
- ↔ double direction
- ← single direction
- non-locating displacement on the seat
- non-locating displacement within the bearing
- ✓ yes
- ✗ no

Bearing type	Image	Load carrying capability			Misalignment		Arrangement				Suitable for					Design features			
		Radial load	Axial load	Moment load	Static misalignment	Dynamic misalignment (few tenths of a degree)	Locating	Non-locating	Adjusted	Floating	Long grease life	High speed	Low run-out	High stiffness	Low friction	Integral sealing	Separable ring mounting	Tapered bore	Standard housings and accessories available
Deep groove ball bearings		+	+ ↔	A-, B+	-	--	↔	□	✗	✓	A+++ B++	A+++ B+	A+++ B++	+	+++	A✓	✗	✗	✗
Insert bearings		+	+ ↔	--	++	--	↔	↔	✗	✗	+++	++	A, B+ C++	+	++	✓	✗	✗	✓
Angular contact ball bearings, single row		+1)	++ ←	--	-	--	✗	✗	✓	✗	++	++	+++	++	++	✓	✗	✗	✗
matched single row		A, B++ C+++1)	A, B++ ↔ C+++ ←	A++, B+ C--	A, C--, B-	--	A, B ↔ C ←	A, B □ C ✗	✗	✗	++	++	+++	++	++	✗	✗	✗	✗
double row		++	++ ↔	++	--	--	↔	□	✗	✗	++	++	++	++	++	A✓	B✓	✗	✗
four-point contact		+1)	++ ↔	--	--	--	↔1)	--	--	--	+	+++	++	++	++	✗	✓	✗	✗
Self-aligning ball bearings		+	-	--	+++	+2)	↔	□	✗	✓	+++	++	++	+	+++	✓	✗	✓	✓
Cylindrical roller bearings, with cage		++	--	--	-	--	✗	■	✗	✗	++	+++	+++	++	+++	✗	✓	✗	✗
full complement, single row		+++	+ ←	--	-	--	←	A, B ←	✗	✓	-	+	+	+++	-	✗	A ✗ B ✓	✗	✗
full complement, double row		+++	A--, B+ ← C+ ↔	--	-	--	B ← C, D ↔	A ■ ↔ B ■ ←	✗	✗	-	+	+	+++	-	D ✓	✗	✗	✗
Needle roller bearings, with steel rings		++	--	--	A, B- C++	--	✗	■ ↔	✗	✗	++	++	+	++	+	A ✓	✓	✗	✗
assemblies / drawn cups		++	A, B-- C-	--	-	--	A, B ✗ C ←	A, B ■ C ■ ←	✗	✗	++	++	+	++	+	B, C ✓	✓	✗	✗
combined bearings		++	A-, B+ C++	--	--	--	←	✗	✓	✗	+	+	+	++	+	✗	✓	✗	✗
Tapered roller bearings, single row		+++1)	++ ←	--	-	--	←	✗	✓	✗	+	++	+++	++	+	✗	✓	✗	✗
matched single row		A, B+++ C+++1)	A, B++ ↔ C+++ ←	A+, B++ C--	A- B, C--	--	A, B ↔ C ←	A, B □ C ✗	A, B ✗ C ✓	✗	+	+	++	+++	+	✗	✓	✗	✗
double row		+++	++ ↔	A+ B++	A-, B--	--	↔	□	✗	✗	+	+	++	+++	+	✓	✓	B ✓	✗
Spherical roller bearings		+++	+ ↔	--	+++	+2)	↔	□	✗	✓	+	++	+++	++	+	✓	✗	✓	✓
CARB toroidal roller bearings, with cage		+++	--	-	++	-	✗	■	✗	✗	+	++	+++	++	+	✗	✗	✓	✓
full complement		+++	--	-	++	-	✗	■	✗	✗	-	+	+++	++	-	✓	✗	✓	✓
Thrust ball bearings		--	A+ ← B+ ↔	--	--	--	A ← B ↔	✗	✗	✗	+	-	++	+	+	✗	✓	✗	✗
with sphered housing washer		--	A+ ← B+ ↔	--	++	--	A ← B ↔	✗	✗	✗	+	-	+	+	+	✗	✓	✗	✗
Cylindrical roller thrust bearings		--	++ ←	--	--	--	←	✗	✗	✗	-	-	+	+++	+	✗	✓	✗	✗
Needle roller thrust bearings		--	++ ←	--	--	--	←	✗	✗	✗	-	-	+	+++	+	✗	✓	✗	✗
Spherical roller thrust bearings		+1)	+++ ←	--	+++	+2)	←	✗	✓	✗	-	+	+	+++	+	✗	✓	✗	✗

1) Provided the F_a/F_r ratio requirement is met 2) Reduced misalignment angle – contact SKF 3) Depending on cage and axial load level