

SKF 81xxx Cylindrical Roller Thrust Bearing — Dimensions, Load Ratings & Interchange (81102 to 81140)

cBallast Technical Sourcing · Cylindrical roller thrust bearing, 81100 & 81200 series · issued 2026-08-29 · cballast.com/documents/skf-81xxx-cylindrical-roller-thrust-bearing-reference

SKF 81xxx cylindrical roller thrust bearing reference: bore d, outside diameter D, height H, dynamic (C) and static (C0) load ratings, and limiting speed for the 81100 (light) and 81200 (medium) TN series from 81102 (bore 15 mm) through 81140 (bore 200 mm). Includes SKF K-suffix variants (K81xxx with a separate housing washer), interchange to FAG, NSK, NTN and Timken cylindrical roller thrust bearings, cage-material notes (TN nylon vs TVPB), fatigue-load limit Pu values, and application guidance for gearbox reaction, marine thrust and hydraulic press service.

SKF 81xxx cylindrical roller thrust bearing (81100 & 81200 series)

The SKF 81xxx cylindrical roller thrust bearing is a single-direction axial-load bearing built from three separable parts: a shaft washer, a housing washer and a caged assembly of straight cylindrical rollers. It is the standard choice for reacting one-way axial loads where a full-complement needle thrust cage is too load-limited, and where a spherical roller thrust bearing's misalignment tolerance is not required. Typical service includes gearbox reaction, worm-gear output shafts, marine propeller thrust, vertical pump columns and mechanical-press ram guides — anywhere the load direction never reverses and the shaft-and-housing rigidity keeps misalignment under 0.001 rad.

SKF sells the range in two size families: the 81100 TN series (light section, bore 15-200 mm) and the 81200 TN series (medium section, higher load rating for the same bore, bore 15-140 mm). The TN suffix denotes a polyamide-6.6 cage stabilised for continuous service to 120 °C; the older TVPB suffix denotes a glass-fibre-reinforced polyamide cage rated to 180 °C for higher-temperature service. A K prefix (K81xxx) indicates the bearing is supplied with a separate spherical seat housing washer that self-aligns up to ±3° — useful where the housing bore cannot be machined perfectly perpendicular to the shaft. The table below gives the SKF General Catalogue dimensional and load-rating data for the 81100 series across the bore range that covers 95 % of specifying applications.

81100 series dimensions and load ratings

Designation | Bore d (mm) | Outside dia. D (mm) | Height H (mm) | C dynamic (kN) | C € static (kN) | Fatigue Pu (kN) | Limiting speed (rpm) |

81102 TN	15	28	9	25.5	62	10.4	4,300
81103 TN	17	30	9	26.5	65.5	11.0	4,000
81104 TN	20	35	10	34.5	91.5	15.3	3,600
81105 TN	25	42	11	40.5	112	18.6	3,000
81106 TN	30	47	11	43.5	127	21.6	2,800
81107 TN	35	52	12	48	146	25	2,400
81108 TN	40	60	13	60	190	32.5	2,200
81109 TN	45	65	14	65.5	216	36.5	2,000
81110 TN	50	70	14	67	228	39	1,900
81111 TN	55	78	16	85	290	49	1,700
81112 TN	60	85	17	96.5	340	58.5	1,600
81113 TN	65	90	18	108	390	67	1,500
81114 TN	70	95	18	112	415	71	1,400
81115 TN	75	100	19	125	475	81.5	1,300
81116 TN	80	105	19	127	500	85	1,300
81117 TN	85	110	19	132	530	90	1,200
81118 TN	90	120	22	163	670	114	1,100
81120 TN	100	135	25	212	900	153	1,000
81122 TN	110	145	25	224	1,000	170	900
81124 TN	120	155	25	232	1,060	180	850
81126 TN	130	170	30	310	1,400	236	800
81128 TN	140	180	31	325	1,500	255	750
81130 TN	150	190	31	335	1,600	270	710
81132 TN	160	200	31	340	1,660	280	670
81134 TN	170	215	34	390	1,900	320	630
81136 TN	180	225	34	400	1,960	335	600
81138 TN	190	240	37	475	2,320	390	560
81140 TN	200	250	37	490	2,450	415	530

Dimensions to ISO 104:2015. Load ratings are calculated to ISO 76:2006 (static) and ISO 281:2007 (dynamic) using the ISO

life-modification factor aISO. Limiting speed is the reference speed for grease lubrication; oil lubrication supports approximately 1.4 × the grease speed at the same operating temperature. The fatigue load limit Pu is the axial load below which infinite ISO 281 life is expected under otherwise ideal conditions.

81200 series (medium section)

The 81200 series shares the same bore range as 81100 but with a thicker cross-section and correspondingly higher load ratings. Use 81200 when the axial-load duty exceeds 81100 by "e 20 % or when the ambient shock loading calls for a higher static safety factor.

Designation | Bore d (mm) | Outside dia. D (mm) | Height H (mm) | C dynamic (kN) | C € static (kN) |

81205 TN | 25 | 47 | 15 | 63 | 170 |
81206 TN | 30 | 52 | 16 | 72 | 200 |
81207 TN | 35 | 62 | 18 | 93 | 270 |
81208 TN | 40 | 68 | 19 | 108 | 325 |
81209 TN | 45 | 73 | 20 | 112 | 355 |
81210 TN | 50 | 78 | 22 | 132 | 425 |
81211 TN | 55 | 90 | 25 | 170 | 560 |
81212 TN | 60 | 95 | 26 | 190 | 640 |
81213 TN | 65 | 100 | 27 | 212 | 730 |
81214 TN | 70 | 105 | 27 | 216 | 780 |
81215 TN | 75 | 110 | 27 | 228 | 830 |
81216 TN | 80 | 115 | 28 | 236 | 880 |
81218 TN | 90 | 135 | 35 | 335 | 1,220 |
81220 TN | 100 | 150 | 38 | 390 | 1,430 |
81222 TN | 110 | 160 | 38 | 400 | 1,500 |
81224 TN | 120 | 170 | 39 | 440 | 1,660 |

K-suffix (K81xxx) self-aligning variant

The K81xxx variant adds a separate housing washer with a spherical seat, machined to match a spherical seating ring supplied with the bearing or, on larger sizes, machined into the housing itself. Self-alignment capability is typically ±0.5° to ±3° depending on size and setup. Use K81xxx when:

Machining tolerances between shaft and housing cannot guarantee perpendicularity to under 0.001 rad (0.06°).

Thermal expansion of the housing will tilt the housing washer relative to the shaft washer during operation (typical on hot pumps and gearbox output shafts).

Shaft deflection under load will misalign the two washers — common on cantilevered marine thrust shafts and vertical pump columns.

The K81xxx bore, OD and load rating are identical to the base 81xxx. Only the height H and mass increase, by the height of the spherical seat washer (typically 4-8 mm depending on size).

Interchange to other bearing makers

Cylindrical roller thrust bearings in the 81100 and 81200 series are dimensionally interchangeable between all major bearing makers because ISO 104 fixes the boundary dimensions (d, D, H). The load-rating C values vary slightly (typically ±10 %) because each maker's rolling-contact fatigue calculation applies a proprietary aISO factor. The material and cage may also differ (SKF TN = polyamide 6.6; FAG PB = polyamide 4.6; NSK M = brass; NTN T2 = steel). For a direct replacement, match the SKF designation to the equivalent below:

SKF | FAG | NSK | NTN | Timken | Koyo |

81102 TN | 81102-TV | 81102 TN | 81102 T2 | T102 | 81102 |
81104 TN | 81104-TV | 81104 TN | 81104 T2 | T104 | 81104 |
81106 TN | 81106-TV | 81106 TN | 81106 T2 | T106 | 81106 |
81108 TN | 81108-TV | 81108 TN | 81108 T2 | T108 | 81108 |
81110 TN | 81110-TV | 81110 TN | 81110 T2 | T110 | 81110 |
81112 TN | 81112-TV | 81112 TN | 81112 T2 | T112 | 81112 |
81114 TN | 81114-TV | 81114 TN | 81114 T2 | T114 | 81114 |
81116 TN | 81116-TV | 81116 TN | 81116 T2 | T116 | 81116 |
81118 TN | 81118-TV | 81118 TN | 81118 T2 | T118 | 81118 |
81120 TN | 81120-TV | 81120 TN | 81120 T2 | T120 | 81120 |
81124 TN | 81124-TV | 81124 TN | 81124 T2 | T124 | 81124 |
81128 TN | 81128-TV | 81128 TN | 81128 T2 | T128 | 81128 |
81132 TN | 81132-TV | 81132 TN | 81132 T2 | T132 | 81132 |
81140 TN | 81140-TV | 81140 TN | 81140 T2 | T140 | 81140 |

Timken uses the "T" prefix for its cylindrical roller thrust range (T102 = 81102), and the last two or three digits match the bore-in-mm / 5 rule – T140 has a 100 mm bore, T220 has a 190 mm bore. Verify the Timken bore against the SKF equivalent before ordering.

Selecting the bearing – axial-load sizing

Cylindrical roller thrust bearings are sized by the equivalent dynamic axial load P and the required L_{10h} rating life in operating hours. Use the standard ISO 281 relation:

$L_{10h} = (106 / 60n) \cdot (C / P)^{10/3}$, where L_{10h} is the 90 %-survivor life in hours, n is the operating speed in rpm, C is the dynamic load rating (kN, above), and P is the equivalent dynamic axial load (kN).

Target life is typically 20,000 h for continuous industrial machines, 30,000 h for pumps and fans, and 40,000-100,000 h for stationary gearboxes. Marine main thrust bearings and mechanical presses are typically sized for 100,000+ h. Where the axial load varies over the operating cycle, use the cube-root mean of the load segments weighted by their operating time fraction.

Lubrication and mounting notes

Grease – standard lithium-complex grease (NLGI 2) is adequate to the limiting-speed values in the table. Above 70 % of limiting speed, switch to a synthetic grease (PAO or ester base) to control operating temperature.

Oil – for continuous-service applications, an ISO VG 68 mineral oil at 40 °C or an ISO VG 100 for higher temperatures. Oil-mist and oil-jet supply extend service life at speeds $> 1.4 \times$ the grease-limiting speed.

Mounting – the shaft washer is the smaller-bore half; the housing washer has the larger OD. Confirm before pressing to avoid a reversed installation, which will destroy the bearing in seconds.

Housing seat – the housing bore must be perpendicular to the shaft axis to under 0.001 rad. If in doubt, specify a K81xxx (self-aligning) variant.

Preload – unlike angular-contact ball bearings, cylindrical roller thrust bearings do not need preload. Assemble with a light axial residual load ($\sim 0.005 \times C$ static) to prevent skidding at start-up, then let the operating axial load dominate.

Related products and references

SKF 81102TN cylindrical roller thrust bearing on cBallast

SKF K81102TN self-aligning variant

All SKF 81xxx cylindrical roller thrust bearings on cBallast

Cylindrical roller thrust bearings across brands

SKF bearings, seals and lubrication

Bearings category

Dimensions and load ratings are the SKF General Catalogue values for the TN cage variant. Confirm against the current SKF product data sheet and the specific application's operating conditions (temperature, contamination, misalignment, load spectrum) before selection.

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