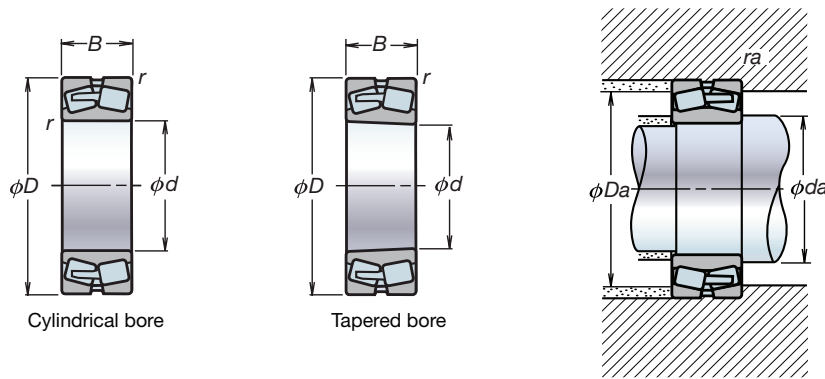


TL Series Spherical Roller Bearings



Dynamic equivalent load

$$P = XF_r + YF_a$$

$F_a / F_r \leq e$		$F_a / F_r > e$	
X	Y	X	Y
1	Y_3	0.67	Y_2

Static equivalent load

$$P_0 = F_r + Y_0 F_a$$

The values for e , Y_2 , Y_3 and Y_0 are given in the table below.

Boundary dimensions (mm)				Basic load ratings (N)		Limiting speeds (min ⁻¹)		Bearing numbers	
d	D	B	r (min.)	C_r	C_{or}	Grease	Oil	Cylindrical bore	Tapered bore (!)
65	140	48	2.1	375 000	380 000	3 200	4 000	TL22313EAE4	TL22313EAKE4
70	150	51	2.1	425 000	435 000	3 000	3 800	TL22314EAE4	TL22314EAKE4
90	190	64	3	665 000	705 000	2 400	3 000	TL22318EAE4	TL22318EAKE4
100	215	73	3	860 000	930 000	2 000	2 600	TL22320EAE4	TL22320EAKE4
110	170	45	2	293 000	465 000	2 000	2 400	TL23022CDE4	TL23022CDKE4
110	200	69.8	2.1	515 000	760 000	1 500	1 900	TL23222CE4	TL23222CKE4
110	240	80	3	825 000	1 120 000	1 700	2 200	TL22322EAE4	TL22322EAKE4
120	260	86	3	955 000	1 320 000	1 600	2 000	TL22324EAE4	TL22324EAKE4
130	280	93	4	995 000	1 350 000	1 300	1 600	TL22326CAE4	TL22326CAKE4
140	210	53	2	420 000	715 000	1 600	1 900	TL23028CDE4	TL23028CDKE4
140	250	68	3	645 000	930 000	1 400	1 700	TL22228CDE4	TL22228CDKE4
140	250	88	3	835 000	1 300 000	1 100	1 500	TL23228CE4	TL23228CKE4
150	225	56	2.1	470 000	815 000	1 400	1 800	TL23030CDE4	TL23030CDKE4
150	250	80	2.1	725 000	1 180 000	1 100	1 400	TL23130CAE4	TL23130CAKE4
150	270	73	3	765 000	1 120 000	1 300	1 600	TL22230CDE4	TL22230CDKE4
150	320	108	4	1 220 000	1 690 000	1 100	1 400	TL22330CAE4	TL22330CAKE4
160	240	60	2.1	540 000	955 000	1 300	1 700	TL23032CDE4	TL23032CDKE4
160	290	80	3	910 000	1 320 000	1 200	1 500	TL22232CDE4	TL22232CDKE4
160	290	104	3	1 100 000	1 770 000	1 000	1 300	TL23232CE4	TL23232CKE4
170	230	45	2	350 000	660 000	1 400	1 800	TL23934BCAE4	TL23934BCAKE4
170	260	67	2.1	640 000	1 090 000	1 200	1 600	TL23034CDE4	TL23034CDKE4
170	280	88	2.1	940 000	1 570 000	1 000	1 300	TL23134CAE4	TL23134CAKE4
170	360	120	4	1 580 000	2 110 000	1 000	1 200	TL22334CAE4	TL22334CAKE4
180	280	74	2.1	750 000	1 270 000	1 200	1 400	TL23036CDE4	TL23036CDKE4
180	320	112	4	1 300 000	2 110 000	850	1 100	TL23236CAE4	TL23236CAKE4
190	290	75	2.1	775 000	1 350 000	1 100	1 400	TL23038CAE4	TL23038CAKE4
190	320	104	3	1 190 000	2 020 000	850	1 100	TL23138CAE4	TL23138CAKE4
190	340	92	4	1 140 000	1 730 000	1 000	1 200	TL22238CAE4	TL22238CAKE4
190	340	120	4	1 440 000	2 350 000	800	1 100	TL23238CAE4	TL23238CAKE4
190	400	132	5	1 890 000	2 590 000	900	1 100	TL22338CAE4	TL22338CAKE4
200	310	82	2.1	940 000	1 700 000	1 000	1 300	TL23040CAE4	TL23040CAKE4
200	340	112	3	1 360 000	2 330 000	800	1 000	TL23140CAE4	TL23140CAKE4
200	360	98	4	1 300 000	2 010 000	950	1 200	TL22240CAE4	TL22240CAKE4
200	360	128	4	1 660 000	2 750 000	750	1 000	TL23240CAE4	TL23240CAKE4
220	340	90	3	1 090 000	1 980 000	950	1 200	TL23044CAE4	TL23044CAKE4
220	370	120	4	1 570 000	2 710 000	710	950	TL23144CAE4	TL23144CAKE4
220	400	108	4	1 570 000	2 430 000	850	1 000	TL22244CAE4	TL22244CAKE4
220	400	144	4	2 010 000	3 400 000	670	900	TL23244CAE4	TL23244CAKE4
220	460	145	5	2 350 000	3 400 000	750	950	TL22344CAE4	TL22344CAKE4
240	320	60	2.1	635 000	1 300 000	950	1 200	TL23948CAE4	TL23948CAKE4
240	360	92	3	1 160 000	2 140 000	850	1 100	TL23048CAE4	TL23048CAKE4
240	400	128	4	1 790 000	3 100 000	670	850	TL23148CAE4	TL23148CAKE4
240	500	155	5	2 600 000	3 800 000	670	850	TL22348CAE4	TL22348CAKE4
260	360	75	2.1	930 000	1 870 000	850	1 000	TL23952CAE4	TL23952CAKE4
260	400	104	4	1 430 000	2 580 000	800	950	TL23052CAE4	TL23052CAKE4
260	440	144	4	2 160 000	3 750 000	600	800	TL23152CAE4	TL23152CAKE4
280	380	75	2.1	925 000	1 950 000	800	950	TL23956CAE4	TL23956CAKE4
280	420	106	4	1 540 000	2 950 000	710	900	TL23056CAE4	TL23056CAKE4
280	460	146	5	2 230 000	4 000 000	560	750	TL23156CAE4	TL23156CAKE4
280	500	176	5	2 880 000	4 900 000	530	670	TL23256CAE4	TL23256CAKE4
300	420	90	3	1 230 000	2 490 000	710	900	TL23960CAE4	TL23960CAKE4
300	460	118	4	1 920 000	3 700 000	670	850	TL23060CAE4	TL23060CAKE4
300	500	160	5	2 670 000	4 800 000	500	670	TL23160CAE4	TL23160CAKE4
300	540	192	5	3 400 000	5 900 000	480	630	TL23260CAE4	TL23260CAKE4
320	540	176	5	3 050 000	5 500 000	480	600	TL23164CAE4	TL23164CAKE4
340	520	133	5	2 280 000	4 400 000	560	710	TL23068CAE4	TL23068CAKE4
340	580	190	5	3 600 000	6 600 000	430	560	TL23168CAE4	TL23168CAKE4
360	540	134	5	2 390 000	4 700 000	530	670	TL23072CAE4	TL23072CAKE4
380	520	106	4	1 870 000	4 100 000	530	670	TL23976CAE4	TL23976CAKE4

Note (!) The suffix K indicates that the bearing has a tapered bore (taper 1:12). Remarks The suffix E4 indicates that the bearing has an oil groove and holes.

Bearing Nomenclature

Example : **TL 23152 CA g3 M K E4 C3 S11**

Spherical roller bearings (Bearing type);
Width series 3 (Bearing series symbols);
Diameter series 1 (Bearing series symbols);
Bearing bore 260 mm (Bore number)

Machined brass cage (Cage type symbol)

Max. operating temperature: less than 200°C
(Special specification symbol)

Radial clearance C3 (Internal clearance symbol)

Outer ring with oil groove and oil holes (External features symbol)

Tapered bore (External features symbol)

TL spec. Inner ring. (Special spec, material symbol) g5: Inner and outer ring

	Abutment and fillet dimensions (mm)					Constant e	Axial load factors			Mass (kg) approx.
	(min.)	d_a (max.)	(max.)	D_a (min.)	r_a (max.)		Y_2	Y_3	Y_0	
77	84	128	119	2	0.33	3.0	2.0	2.0	3.52	
82	91	138	129	2	0.33	3.0	2.0	2.0	4.28	
104	115	176	163	2.5	0.33	3.1	2.1	2.0	8.56	
114	130	201	184	2.5	0.33	3.0	2.0	2.0	12.7	
120	124	160	153	2	0.24	4.2	2.8	2.8	3.76	
122	130	188	170	2	0.34	3.0	2.0	1.9	9.54	
124	145	226	206	2.5	0.30	3.1	2.1	2.0	17.6	
134	157	246	222	2.5	0.32	3.1	2.1	2.0	22.2	
148	—	262	236	3	0.34	2.9	2.0	1.9	27.8	
150	157	200	190	2	0.22	4.5	3.0	2.9	6.49	
154	167	236	219	2.5	0.25	4.0	2.7	2.6	14.5	
154	163	236	213	2.5	0.35	2.9	1.9	1.9	18.8	
162	168	213	203	2	0.22	4.6	3.1	3.0	7.90	
162	—	238	218	2	0.30	3.4	2.3	2.2	15.8	
164	179	256	236	2.5	0.26	3.9	2.6	2.5	18.4	
168	—	302	270	3	0.35	2.9	1.9	1.9	41.5	
172	179	228	216	2	0.22	4.5	3.0	2.9	9.66	
174	190	276	255	2.5	0.26	3.8	2.6	2.5	23.1	
174	189	276	245	2.5	0.34	2.9	2.0	1.9	30.5	
180	—	220	213	2	0.17	5.8	3.9	3.8	5.38	
182	191	248	233	2	0.23	4.3	2.9	2.8	13.0	
182	—	268	245	2	0.29	3.5	2.3	2.3	21.0	
188	—	342	304	3	0.35	2.9	1.9	1.9	57.9	
192	202	268	249	2	0.24	4.2	2.8	2.8	17.1	
198	—	302	274	3	0.35	2.9	1.9	1.9	38.5	
202	—	278	261	2	0.24	4.2	2.8	2.8	17.6	
204	—	306	276	3.5	0.31	3.2	2.2	2.1	34.0	
208	—	322	296	3	0.26	3.8	2.6	2.5	35.5	
208	—	322	288	3	0.35	2.9	1.9	1.9	46.5	
212	—	378	338	4	0.34	2.9	2.0	1.9	77.6	
212	—	298	279	2	0.25	4.0	2.7	2.6	22.6	
214	—	326	293	2.5	0.32	3.2	2.1	2.1	41.5	
218	—	342	315	3	0.26	3.8	2.6	2.5	42.6	
218	—	342	307	3	0.35	2.9	1.9	1.9	57.0	
234	—	326	302	2.5	0.24	4.1	2.8	2.7	29.7	
238	—	352	320	3	0.31	3.2	2.2	2.1	52.0	
238	—	382	348	3	0.27	3.7	2.5	2.4	59.0	
238	—	382	337	3	0.36	2.8	1.9	1.8	79.5	
242	—	438	391	4	0.33	3.0	2.0	2.0	116	
252	—	308	298	2	0.17	6.0	4.0	3.9	13.3	
254	—	346	324	2.5	0.24	4.2	2.8	2.7	32.6	
258	—	382	347	3	0.31	3.3	2.2	2.2	64.5	
262	—	478	423	4	0.32	3.2	2.1	2.1	147	
272	—	348	333	2	0.19	5.4	3.6	3.5	23.0	
278	—	382	356	3	0.25	4.1	2.7	2.7	46.6	
278	—	422	380	3	0.32	3.2	2.1	2.1	88.2	
292	—	368	351	2	0.18	5.7	3.9	3.8	24.5	
298	—	402	377	3	0.24	4.2	2.8	2.7	50.5	
302	—	438	400	4	0.30	3.3	2.2	2.2	94.3	
302	—	478	425	4	0.35	2.9	1.9	1.9	147	
314	—	406	386	2.5	0.19	5.2	3.5	3.4	38.2	
318	—	442	413	3	0.24	4.2	2.8	2.7	70.5	
322	—	478	433	4	0.31	3.3	2.2	2.2	125	
322	—	518	458	4	0.35	2.9	1.9	1.9	189	
342	—	518	466	4	0.31	3.2	2.1	2.1	162	
362	—	498	465	4	0.24	4.2	2.8	2.8	101	
362	—	558	499	4	0.31	3.2	2.1	2.1	206	
382	—	518	485	4	0.24	4.2	2.8	2.8	106	
398	—	502	482	3	0.18	5.5	3.7	3.6	65.4	