

Bearings for rolling mills



EVOLMEC[®]
EVOLUZIONE MECCANICA



ROGALLA[®]
WÄLZLAGER • DREHVERBINDUNGEN

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Description

Four-row cylindrical roller radial bearings are used almost exclusively in the rolling stands.

They have a lower friction than the other roller bearings and they are suitable for applications where high speeds are required. The reduced radial encumbrance of these bearings lets the adoption of big diameter necks compared to lamination roll.

In the four-row cylindrical roller bearings, rollers are driven on the outer ring between integrals edges or not integrals. The inner ring is devoid of edges. The bearing can cope, within certain limits, to axial displacement of the tree compared to the lodging. Depending on the application, bearings like this can be provided with cylindrical bore or conic. The rings, inner and outer, can be just in one piece or into several pieces. Bearings with more than four rows of cylindrical rollers and equipped cages are mostly used for big cold rolling mills for plane products, where lamination efforts are considerable and the speed very high. Bearings with more than four rows are produced for necks of the cylinders with diameters over about 220 mm. The outer ring is equipped with two not integral edges, while the rollers are self-guided.

Dimensions

The encumbrance sizes of radial cylindrical roller bearings with several rows listed in the tables comply with the norm **ISO 15:2017**.

Tolerances

Excluding specific customer requests, four-row radial cylindrical roller bearings are normally manufactured with dimensional precision class **P6** and form precision class **P5**, and those with six rows according to the normal precision. Tolerances values, conform to **ISO 492:2014**, will be found in the tables from page 24 to page 25.

Radial internal clearance

Four-row cylindrical roller radial bearings are manufactured with a radial inner clearance **C3** or **C4**, while those with six rows have variable clearances according to the use. On customer request, however, we can provide bearings with different clearances to these one. All bearings of this type, that have an helical groove in the hole of

the inner ring, are manufactured with radial inner clearance **C2**. The values of the clearance limits conform to **ISO 5753-1:2009** for the size range covered by this standard. Radial clearance values will be found in the table on the opposite page.

Misalignment

For this kind of bearings it is not expected any kind of misalignment.

Inner and outer rings

Material: Core hardened steel 100Cr6 (UNI 3097 – WNr. 1.3505) or 100CrMo7 (WNr.1.3507) according to the sizes.

On request and for special applications they can be manufactured in case-hardening steel.

Heat treatment: Annealing (annealing of workability), hardening and tempering.

These treatments will be always performed ensuring a stabilization **ST0** (for use of bearings without deformations of the rings up to temperatures of 150°C).

On request these treatments can be performed ensuring a final stabilization **ST1 & ST2**.

ST1- for functioning without deformations of the rings up to 200°C (**suffix ST1**)

ST2- for functioning without deformations of the rings up to 250°C (**suffix ST2**).

Hardness: 58/62 HRC

To improve the working of the cage (see the following paragraph) all the outer rings produced by **EVOLMEC** have the **internal central flange grinded**. (see paragraph relating to available executions)

Cage

Material: Generic brass

Multi-row cylindrical roller bearings are generally provided according to the execution with two double pronged machined brass cages **guided on rolls**, steel pin-type cage (and pierced rollers) or with two double row window-type massive brass cages.

Two double pronged machined brass cages produced by **EVOLMEC** are manufactured with important changes compared to the execution available on the market.

These changes ensure an optimal functioning of the cage which is an important and essential component for the good working of rolling bearings. A cage that is quickly manufactured with non-appropriate machining can cause the early death of the rolling system and consequently of the bearing itself.

The two double pronged machined brass cages we had studied have the following changes:

- Production process in several stages in order to minimize to the minimum the internal tensions of the cage.
- Outer central flanges are grinded: it ensures the **cage will be guided correctly on the inner central flange in the outer ring** (which is grinded as well). It ensures the minimization of the power lost by sliding friction, reducing the working temperature of bearing.

Rollers

Material: Core-hardened steel 100Cr6 (UNI 3097)

On request they can be manufactured in case-

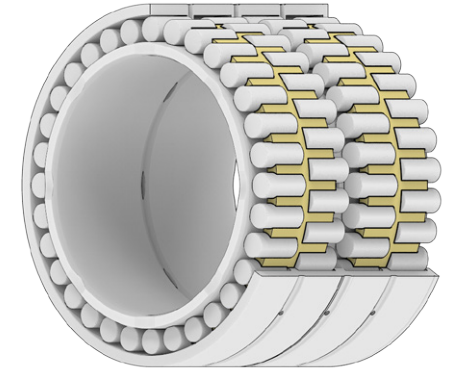
hardening steel (pierced rollers).

Heat treatment: Annealing (annealing of workability), hardening and tempering.

Hardness: 60/64 HRC

Designations

Supplementary designations (prefixes and suffixes) will be found at page 27.

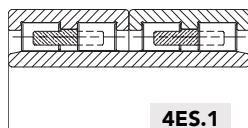


Radial internal clearance of cylindrical roller bearings with cylindrical bore

Bore diameter d [mm]		Radial internal clearance [µm]									
		C2		Normal		C3		C4		C5	
over	incl.	min	max	min	max	min	max	min	max	min	max
80	100	15	50	50	85	75	110	105	140	155	190
100	120	15	55	50	90	85	125	125	165	180	220
120	140	15	60	60	105	100	145	140	190	200	245
140	160	20	70	70	120	115	165	165	215	228	275
160	180	25	75	75	125	120	170	170	220	280	300
180	200	35	90	90	145	140	195	195	250	275	330
200	225	45	105	105	165	160	220	220	280	305	365
225	250	45	110	110	175	170	235	235	300	330	396
250	280	55	125	125	195	190	260	260	330	370	440
280	315	55	130	130	205	200	275	275	350	410	485
315	355	65	145	145	225	225	305	305	385	455	535
355	400	100	190	190	280	280	370	370	460	510	600
400	450	110	210	210	310	310	410	410	510	565	665
450	500	110	220	220	330	330	440	440	550	625	735
500	560	120	240	240	360	360	480	480	600	690	810
560	630	140	260	260	380	380	500	500	620	780	900
630	710	145	285	285	425	425	560	560	705	865	1.005
710	800	150	310	310	470	470	630	630	790	975	1.135
800	900	180	350	350	520	520	690	690	860	1.095	1.265
900	1.000	200	390	390	580	580	770	770	960	1.215	1.405
1.000	1.120	220	430	430	640	640	850	850	1.060	1.355	1.565
1.120	1.250	230	470	470	710	710	950	950	1.190	1.510	1.750
1.250	1.400	270	530	530	790	790	1.050	1.050	1.310	1.680	1.940
1.400	1.600	330	610	610	890	890	1.170	1.170	1.450	1.920	2.200
1.600	1.800	380	700	700	1.020	1.020	1.340	1.340	1.660	2.160	2.480
1.800	2.000	400	760	760	1.120	1.120	1.480	1.480	1.840	2.390	2.760

EXECUTION 4ES.1

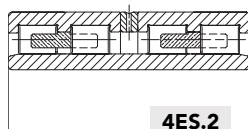
Two outer rings each with three integral flanges. One inner ring. Two roller guided double pronged machined brass cages. With or without annular groove and/or lubricating holes in the outer rings (see dimensional tables of bearings, dimensions b and k).



4ES.1

EXECUTION 4ES.2

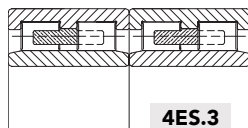
Two outer rings each with three integral flanges, and with an intermediate ring between the two outer rings. One inner ring. Two roller guided double pronged machined brass cages. With or without annular groove and/or lubricating holes in the outer rings (see dimensional tables of bearings, dimensions b and k).



4ES.2

EXECUTION 4ES.3

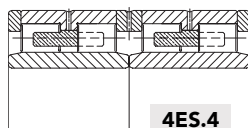
Two outer rings each with three integral flanges. Two inner rings. Two roller guided double pronged cages of brass. With or without annular groove and/or lubricating holes in the outer rings (see dimensional tables of bearings, dimensions b and k).



4ES.3

EXECUTION 4ES.4

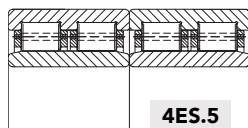
Two outer rings each with an integral central flange and two loose flange rings; one intermediate ring. Two inner rings. Two roller guided double pronged machined brass cages. With or without annular groove and/or lubricating holes in the outer rings (see dimensional tables of the bearings, dimensions b and k).



4ES.4

EXECUTION 4ES.5

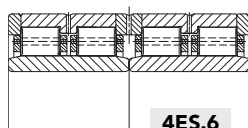
Two outer rings each with an integral central flange and two loose flange rings; one intermediate ring. Two inner rings. Pierced rollers and four pin-type cages of steel or brass. With or without annular groove and/or lubricating holes in the outer rings (see dimensional tables of the bearings, dimensions b and k).



4ES.5

EXECUTION 4ES.6

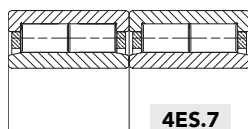
Two outer rings each with an integral central flange and two loose flange rings; one intermediate ring. Two inner rings. Pierced rollers and four pin-type cages of steel or brass. With or without annular groove and/or lubricating holes in the outer rings (see dimensional tables of the bearing, dimensions b and k).



4ES.6

EXECUTION 4ES.7

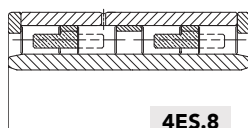
Two outer rings each with two integral flanges. Two inner rings. Two double row window-type machined brass cages (two rollers per cage pocket)



4ES.7

EXECUTION 4ES.8

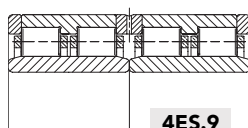
One outer ring with three loose guide rings and two loose flange rings. One inner ring. Two double pronged machined brass cages. With or without annular groove and/or lubricating holes in the outer ring (see dimensional tables of bearings, dimensions b and k).



4ES.8

EXECUTION 4ES.9

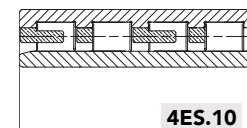
Two outer rings each with an integral central flange and two loose flange rings; one intermediate ring. Two inner rings. Four pressed steel cages. With or without annular groove and/or lubricating holes in the outer rings (see dimensional tables of bearings, dimensions b and k).



4ES.9

EXECUTION 4ES.10

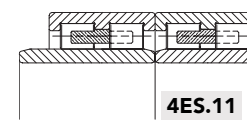
One outer ring with five integral flanges. One inner ring. Four roller guided pronged cages of brass. With annular groove and lubricating holes in the outer ring (see dimensional tables of bearings, dimensions b and k).



4ES.10

EXECUTION 4ES.11

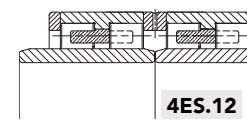
Two outer rings each with three integral flanges. Two inner rings, one of which is extended. Two roller guided double pronged machined brass cages. With or without annular groove and/or lubrication holes in the outer rings (see dimensional tables of bearings, dimensions b and k).



4ES.11

EXECUTION 4ES.12

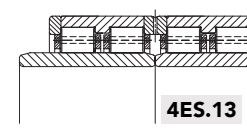
Two outer rings each with an integral central flange and two loose flange rings; one intermediate ring. Two inner rings, one of which is extended. Two roller guided double pronged machined brass cages. With or without annular groove and/or lubrication holes in the outer rings (see dimensional tables of bearings, dimensions b and k).



4ES.12

EXECUTION 4ES.13

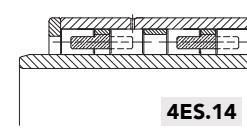
Two outer rings each with an integral central flange and two loose flange rings; one intermediate ring. Two inner rings, one of which is extended. Pierced rollers and four steel pin-type cages. With or without annular groove and/or lubrication holes in the outer rings (see dimensional tables of bearings, dimensions b and k).



4ES.13

EXECUTION 4ES.14

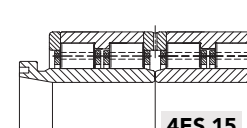
One outer ring with three loose guide rings and two loose flange rings. One extended inner ring. Two roller guided double pronged machined brass cages. With or without annular groove and/or lubrication holes in the outer ring (see dimensional tables of bearings, dimensions b and k).



4ES.14

EXECUTION 4ES.15

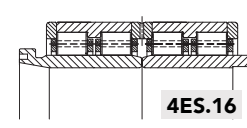
Two outer rings each with an integral central flange and two loose flange rings; one intermediate ring. Two inner rings, one of which is extended and has a concentric shoulder. Pierced rollers and four steel pin-type cages. With annular groove and lubrication holes in the outer rings (see dimensional tables of bearings, dimensions b and k).



4ES.15

EXECUTION 4ES.16

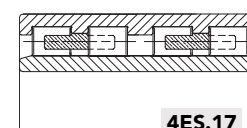
Two outer rings each with an integral central flange and two loose flange rings; one intermediate ring. Two extended inner rings, one of which has a concentric shoulder. Pierced rollers and four steel pin-type cages. With annular groove and lubrication holes in the outer rings (see dimensional tables of bearings, dimensions b and k).



4ES.16

EXECUTION 4ES.17

An outer ring with five integral flanges. An inner ring. Two side-to-side massive brass cage guided on flanges in the outer ring. With or without annular groove and/or lubricating holes in the outer ring (see dimensional tables of bearings, dimensions b and k).



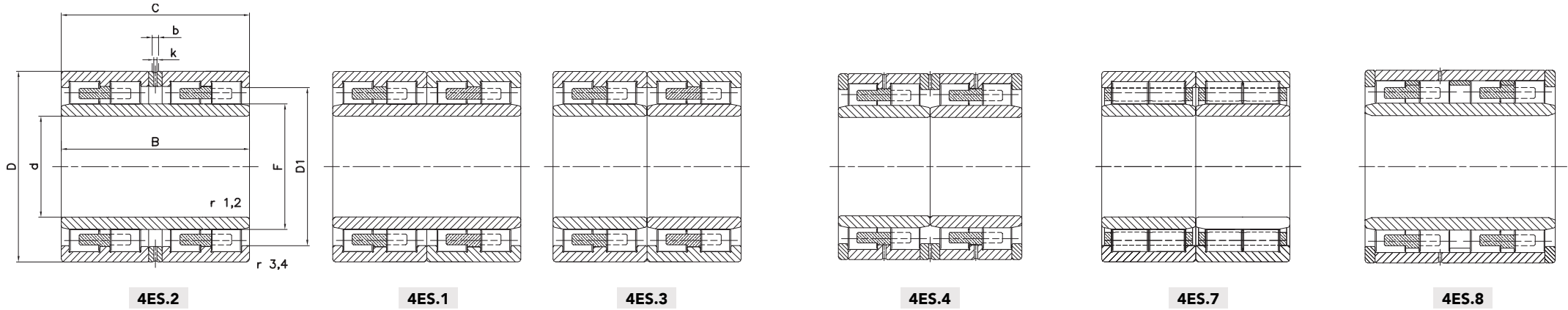
4ES.17

Four-row cylindrical roller bearings

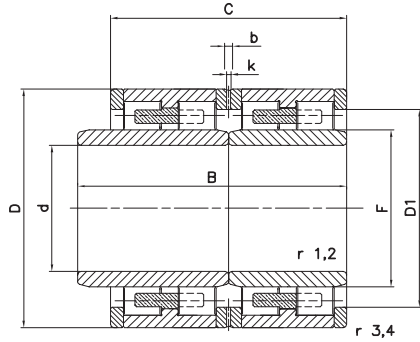
Dimensional tables

Four-row cylindrical roller bearings

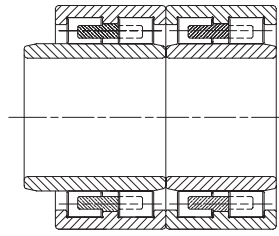
Dimensional tables



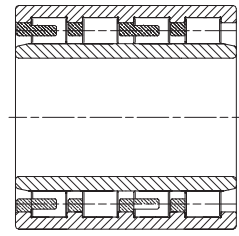
EVOLMEC											SKF				FAG			Weight [kg]			
d	D	B	C	F	D ₁	b	k	r _{1,2}	r _{3,4}	Load rating		CODE	Execution	CODE	Execution	Load rating			CODE	Load rating	
										dyn. C	stat. C ₀					dyn. C	stat. C ₀			dyn. C	stat. C ₀
115	165	107,5	90	132,5	151	-	-	1,1	1,1	485	830	EVMW.23.11	4ES.11	BC4B 319738 A	E.11	402	765	-	-	-	8,5
127	174,625	150,812	150,812	139,5	159	-	-	1,1	1,5	810	1.550	EVMW.25.4.12	4ES.3	315643/VJ202	E.3	627	1.320	529469.N12BA	800	1.430	10,5
139,700	215	195	187	156,285	188	-	-	3	0,4	1.440	2.530	EVMW.27.9.13	4ES.14	BC4B 466971 B	E.14	1.010	2.280	-	-	-	25
	215	195	187	159,285	188	-	-	3	0,4	1.450	2.680	EVMW.27.9.14	4ES.14	BC4B 459696	E.14	1.210	2.550	-	-	-	24
145	210	155	155	166	190	-	-	1,1	1,1	935	1.790	EVMW.29.15	4ES.1/SCFE	314625	E.1/WO	792	1.560	511605	1.080	1.930	18
	225	156	156	169	197	-	-	2	2	1.130	2.010	EVMW.29.16	4ES.1/SCFE	313924 A	E.1/WO	897	1.660	512764	1.250	1.960	23
150	230	156	156	174	202	-	-	2	2	1.130	2.010	EVMW.30.17	4ES.1/SCFE	313891 A	E.1/WO	897	1.660	506962	1.140	1.860	24
	230	130	130	180	210	-	-	1,5	1,5	915	1.600	EVMW.32.18	4ES.1/SCFE	314190	E.1/WO	781	1.340	502894B	830	1.340	17
160	230	168	168	179	204	-	-	2	2	1.180	2.210	EVMW.32.19	4ES.1/SCFE	315189 A	E.1/WO	897	2.200	510150B	1.160	2.080	23,5
	233	180	180	178,515	206	8,9	6	2,5	1,8	1.465	2.750	EVMW.32.20	4ES.8/SVSCFI	BC4B 457627 VCA	E.8/GWI	1.140	2.800	-	-	-	26,5
165,100	225,425	168,275	168,275	181	205	-	-	1,5	1,5	1.200	2.250	EVMW.33.02.21	4ES.3	315642/VJ202	E.3	1.010	2.240	529468.N12BA	1.100	2.000	20
	230	130	130	188,5	211	-	-	2	2	860	1.650	EVMW.34.22	4ES.2	313673	E.2	671	1.400	508370	780	1.400	15
170	230	160	160	185,5	212	-	3	2	2	1.150	2.270	EVMW.34.23	4ES.3	BC2B 322340/HB1VJ202	E.3	1.100	2.360	567622	1.200	2.200	19
	240	130	130	190	218	-	-	2	2	1.000	1.840	EVMW.34.24	4ES.1/SCFE	BC4B 635122	E.1/WO	913	1.830	510440B	1.000	1.630	19
180	260	225	225	196	230	8,3	4,5	2,1	2,1	1.950	3.720	EVMW.34.25	4ES.1	313587 B	E.1	1.650	3.350	505470	1.930	3.350	43,5
	260	168	168	202	233	-	-	2,1	2,1	1.400	2.600	EVMW.36.26	4ES.1/SCFE	313812	E.1/WO	1.280	2.500	507536	1.200	2.000	29,5
190	260	168	168	212	237	-	-	2	2	1.300	2.630	EVMW.38.27	4ES.1/SCFE	313651	E.1/WO	1.140	2.600	507735	1.340	2.000	27
	270	200	200	212	242	-	-	2,1	2,1	1.690	3.400	EVMW.38.28	4ES.1/SCFE	314199 B	E.1/WO	1.510	3.350	508657	1.660	3.000	37,5
200	280	200	200	214	251	-	-	2,1	2,1	1.910	3.610	EVMW.38.29	4ES.1/SCFE	314049 A	E.1/WO	1.720	3.350	510199	1.830	3.150	41,5
	270	170	170	222	349	-	-	2,1	2,1	1.340	2.810	EVMW.40.30	4ES.1/SCFE	314553	E.1/WO	1.170	2.700	522742B	1.290	2.600	28,5
200	280	170	170	222	252	-	-	2,1	2,1	1.500	2.850	EVMW.40.31	4ES.1/SCFE	314385	E.1/WO	1.380	3.000	507344	1.630	3.200	33,5
	280	170	170	222	253	-	-	2,1	2,1	1.580	3.050	EVMW.40.32	4ES.3/SCFE	BC4B 319659	E.7/WO	1.450	3.200	-	-	-	35
200	280	180	170	222	252	-	-	2,1	2,1	1.580	3.050	EVMW.40.33	4ES.11/SVSCF	319019	E.11/GW	1.380	3.000	-	-	-	35
	280	200	200	222	252	-	-	0,6	2,1	1.820	3.650	EVMW.40.34	4ES.1/SCFE	313893	E.1/WO	1.510	3.350	508726	1.630	3.200	39
200	285	200	200	222,5	236	10	6	2,1	2	2.000	3.930	EVMW.40.35	4ES.8/SVSCFI	BC4B 457628	E.8/GWI	1.470	3.900	-	-	-	44
	290	192	192	226	260	-	-	2,1	2,1	1.750	3.350	EVMW.40.36	4ES.1/SCFE	313811	E.1/WO	1.540	3.200	512580B	1.800	3.150	42,5
200	290	192	192	226	260	-	-	4,5	2,1	1.800	3.350	EVMW.40.37	4ES.1/SCFE	313811 A	E.1/WO	1.540	3.200	-	-	-	42,5
	310	230	230	229	273	-	-	2,1	2,1	2.310	4.300	EVMW.40.38	4ES.3	313639/VJ202	E.3	2.010	3.750	514958	2.700	4.250	63
210	290	192	192	236	264	-	-	2,1	2,1	1.690	3.600	EVMW.42.39	4ES.1/SCFE	313646	E.1/WO	1.450	3.400	507628	1.700	3.400	41
	300	20	20	240	276	-	4,5	2,1	2,1	1.950	4.000	EVMW.44.40	4ES.3/SCFE	BC2B 322341/HB1VJ202	E.3/WO	1.790	3.900	567623	1.830	3.350	41
220	310	192	192	246	280	-	-	2,1	2,1	1.940	3.680	EVMW.44.41	4ES.1/SCFE	313839	E.1/WO	1.680	3.650	507333	1.830	3.200	46
	310	225	225	244	278	-	-	0,6	2,1	2.280	4.500	EVMW.44.42	4ES.1/SCFE	313894 B	E.1/WO	1.940	4.300	514461	2.200	41.500	54,5
230	330	230	230	249	294	-	-	2,1	2,1	2.450	4.680	EVMW.44.43	4ES.3/SCFE	314889/VJ202	E.3/WO	2.050	4.000	541452	2.360	3.900	68,5
	330	206	206	260	297	-	-	2,1	2,1	2.260	4.430	EVMW.46.44	4ES.1/SCFE	313824	E.1/WO	1.870	4.000	508727B	2.160	3.900	58
230	365	250	250	266	321	11,1	6	3	3	2.920	5.700	EVMW.46.45	4ES.4	313581 A	E.4	2.640	4.900	529113	3.150	-	100



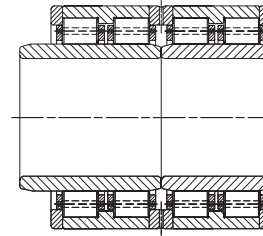
4ES.12



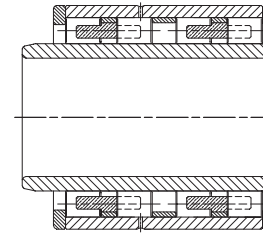
4ES.11



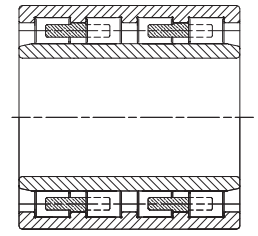
4ES.10



4ES.13



4ES.14



4ES.17

EVOLMEC											SKF				FAG				Weight [kg]		
d	D	B	C	F	D ₁	b	k	r _{1,2}	r _{3,4}	Load rating		CODE	Execution	CODE	Execution	Load rating		CODE		Load rating	
										dyn.	stat.					C	C ₀			dyn.	stat.
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kN]	[kN]					[kN]	[kN]		[kN]	[kN]	
240	330	180	180	265	299	-	-	2,1	2,1	1.950	3.830	EVMW.48.46	4ES.3/SCFE	635194	E.7/WO	1.720	3.800	504547	2.040	3.900	49,5
	330	220	220	265	300	-	-	2,1	2,1	2.230	4.550	EVMW.48.47	4ES.1/SCFE	313921	E.1/WO	1.720	4.300	-	-	-	58
	330	240	220	270	300	-	-	2,1	2,1	2.000	4.420	EVMW.48.48	4ES.17/SCFI	BC4B 320415	E.10/WI	1.720	4.300	-	-	-	60
	360	290	290	270	327	8,3	4,5	8x20°	2	3.660	7.170	EVMW.48.49	4ES.4/SCFI	BC4B 322292 A/HB3	E.4/WI	3.300	6.550	514959	3.350	5.700	130
250	340	230	230	310	276	9	8	3	2,3x45°	2.670	5.500	EVMW.50.50	4ES.8/SVSCFI	BC4B 457629 VCA	E.8/GWI	1.870	5.000	-	-	-	65
	360	204	204	287	326	-	-	2,1	2,1	2.340	4.670	EVMW.52.51	4ES.3/SCFE	314997/VJ202	E.3/WO	1.980	4.400	-	-	-	64,5
	360	230	230	292	326	-	-	3	3	2.490	5.340	EVMW.52.52	4ES.1/SCFE	BC4B 320956	E.1/WO	1.980	4.650	533880	2.500	5.000	73,5
	370	220	220	292	332	-	-	3	3	2.600	5.160	EVMW.52.53	4ES.1/SCFE	313823	E.1/WO	2.160	4.650	507336	2.200	4.050	77,5
260	370	240	220	292	332	-	-	3	3	2.600	5.160	EVMW.52.54	4ES.11/SVSCF	BC4B 319464/HA3	E.11/GW	2.160	4.605	-	-	-	78,5
	400	290	290	296	352	7	5	4	4	3.950	7.650	EVMW.52.55	4ES.4/SCFI	313427 B	E.4/WI	3.520	7.100	518214	3.900	6.300	135
	370	234	234	300	336	-	-	2	2	2.600	5.560	EVMW.53.56	4ES.1/SCFE	313922	E.1/WO	2.240	5.400	517423	2.500	5.100	80,5
	380	295	275	300	345	8,3	4,5	2	1	3.450	7.200	EVMW.54.57	4ES.12/SVSCFI	315605	E.12/GWI	3.080	7.200	-	-	-	100
280	380	290	290	308,5	352	-	6	7x20°	2,1	3.400	7.700	EVMW.56.58	4ES.4/SCFI	BC4-0001	E.4/WI	2.750	6.950	-	-	-	75
	390	220	220	312	352	-	-	3	3	2.600	5.250	EVMW.56.59	4ES.1/SCFE	313822	E.1/WO	2.240	5.000	507339B	2.400	4.550	82,5
	390	250	220	312	352	-	-	3	3	2.750	5.450	EVMW.56.60	4ES.11/SVSCF	319259	E.11/GW	2.240	5.000	-	-	-	84,5
	390	275	275	308	353	11,1	6	7x20°	1,1	3.480	7.330	EVMW.56.61	4ES.4/SCFI	314719 C	E.4/WI	3.080	7.200	527104	3.600	6.800	100
	400	285	285	316	360	-	-	3	3	3.700	7.700	EVMW.56.62	4ES.3/SCFE	314070/VJ202	E.3/WO	3.140	7.350	513342.N12BA	3.400	6.400	120
	410	300	300	313	368	-	-	4	4	4.000	8.000	EVMW.56.63	4ES.3/SCFE	314897/VJ202	E.3/WO	3.520	7.500	510350.C4.N12BA	3.900	6.950	130
290	420	300	300	319	372	8,3	4,5	4	4	4.370	8.700	EVMW.56.64	4ES.4	313487	E.4	3.470	7.350	-	-	-	150
	390	190	190	316	356	-	-	2,1	2,1	2.340	4.560	EVMW.58.65	4ES.3/SCFE	635195	E.7/WO	2.050	4.550	-	-	-	67
	420	300	300	332	379	11,1	6	7x20°	1,5	4.180	8.800	EVMW.60.66	4ES.4/SCF	314484 D	E.4/W	3.740	8.800	524289B	4.150	8.000	130
	420	320	300	332	379	11,1	6	4	1,5	4.300	9.100	EVMW.60.67	4ES.12/SCFI	319129	E.12/W	3.740	8.800	-	-	-	135
320	420	330	300	332	379	11,1	6	6,4x20°	1,5	4.300	9.100	EVMW.60.68	4ES.12/SVSCFI	BC4-0003	E.12/GWI	3.740	8.800	-	-	-	140
	460	240	240	364	425	-	-	3	3	3.520	6.900	EVMW.64.69	4ES.3/SCFE	BC4B 322216/VJ202	E.7/WO	2.920	7.200	804571	3.750	7.200	140
	480	350	350	364	426	13,9	7,5	10x20°	1,5	5.780	11.600	EVMW.64.70	4ES.4/SCFE	314274 B	E.6/WI	4.950	10.800	513654A	5.850	10.800	220
	460	340	340	365	415	11,1	6	10,5x20°	1,5	4.480	10.510	EVMW.66.71	4ES.4/SCFI	313445 C	E.4/WI	4.180	10.200	543447	4.650	9.500	175
340	480	350	350	378	431	11,1	6	8x20°	1,5	5.300	11.500	EVMW.68.72	4ES.4/SCFI	314485 A	E.4/WI	4.570	11.000	-	-	-	205
	480	350	350	378	431	11,1	6	8x20°	1,5	5.400	12.000	EVMW.68.72	4ES.4/SVSCFI	314485 C	E.4/GWI	4.570	11.000	527634	5.300	11.000	205
	480	370	350	378	431	11,1	6	4	1,5	5.400	12.000	EVMW.68.73	4ES.12/SCFI	319040 A	E.12/WI	4.570	11.000	-	-	-	200
	500	370	370	385	452	-	9	13x20°	3	5.950	12.600	EVMW.68.74	4ES.4/SCFE	BC4B 322261/HB1	E.6/WI	5.230	11.800	517794	6.550	13.200	260
	560	380	380	396	486	-	7,5	5	4	7.560	14.000	EVMW.68.75	4ES.4/SCFE	313404 A	E.6/WI	6.820	12.900	345171	7.650	12.200	350
	500	380	380	389	450	-	7,5	5	5	6.000	12.600	EVMW.70.76	4ES.3	314563/VJ202	E.3	4.950	11.400	532381.N12BA	5.700	11.200	240
350	500	410	410	388	455	16,7	9	11,5x20°	3	6.400	13.800	EVMW.70.78	4ES.4/SCFE	BC4B 322777/HB1	E.6/WI	5.830	13.700	532001	7.100	14.300	285
	510	300	300	401	468	-	6	5	5	4.700	9.750	EVMW.70.79	4ES.3	BC2B 319878/VJ202	E.3	4.290	9.000	-	-	-	220
	520	300	300	401	468	-	6	8x20°	5	5.000	9.800	EVMW.70.80	4ES.1/SVSCFI	BC4B 326909/HA3	E.1/GWI	4.290	9.000	568450	5.100	8.800	220
	520	320	300	401	468	-	6	8x20,5°	5	5.160	10.160	EVMW.70.81	4ES.11/SVSCF	BC4B 326858/HB3	E.11/GW	4.290	9.000	-	-	-	240

Description

Single-row deep groove ball bearings are the most common type of rolling bearings. Their range of application is very wide. The raceway grooves in both the inner and outer rings have circular arcs of slightly larger radius than that of the balls. Their straight forward basic design has many advantages:

- good radial load capacity;
- acceptable axial load capacity in both directions;
- have low torque capacity at startup and running speeds;
- can operate with low noise;
- require little maintenance.

When the radial load of a rolling mill is taken by four (or two) rows cylindrical roller bearings, the deep groove ball bearings are used as assistant bearings at the roll's driven end and to withstand a part of axial load.

Dimensions

The boundary dimensions of the bearings listed in the tables conform to **ISO 15:2017**.

Tolerances

Deep groove ball bearings are produced with normal tolerances (**P0**) as standard or with increased accuracy corresponding to tolerance classes **P6** and **P5** (where running tolerance is critical). Please contact our technical department to check the availability of bearings to **P6** and **P5** specifications.

Tolerances values, conform to **ISO 492:2014**, will be found in the tables from page **24** to page **25**.

Radial internal clearance

Generally larger clearance will be adopted when used in rolling mills.

The values of the clearance limits conform to **ISO 5753-1:2009** for the size range covered by this standard. Radial internal clearance values will be found in the table on the opposite page.

Inner and outer rings

Material: Core hardened steel 100Cr6 (UNI 3097 – WNr. 1.3505) or 100CrMo7 (WNr.1.3507) according to the sizes.

On request and for special applications they can be manufactured in case-hardening steel.

Heat treatment: Annealing (annealing of workability), hardening and tempering.

These treatments will be always performed ensuring a stabilization **ST0** (for use of bearings without deformations of the rings up to temperatures of 150°C).

On request these treatments can be performed ensuring a final stabilization **ST1 & ST2**.

ST1- for functioning without deformations of the rings up to 200°C (**suffix ST1**)

ST2- for functioning without deformations of the rings up to 250°C (**suffix ST2**).

Hardness: 58/62 HRC

Cage

Single row deep groove ball bearings, which have two pieces riveted steel cage (**Figure 1**) as standard (code with no suffix regarding the cage execution), may be supplied with machined-brass cage (**Figure 2**) for particular applications.

Please refer to the suffixes in the next page to determine the available cages executions.



Figure 1

Two pressed-steel half cages are fixed together with rivets. They are designed to reduce frictional torque and have high rigidity and strength, making it the cage of choice for most applications.

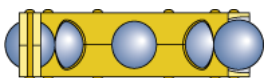


Figure 2

Two identical half cages made from solid brass are fixed together with rivets. Superior strength enables this cage to be used in heavily loaded and high-speed applications. On request this cage can be made in a single piece.

Balls

Material: Core-hardened steel 100Cr6 (UNI 3097)

Heat treatment: Annealing (annealing of workability), hardening and tempering.

Hardness: 60/64 HRC

Misalignment

Single row deep groove ball bearings have very limited ability to accommodate errors of alignment. The permissible angular misalignment between inner and outer rings, which will not produce inadmissibly high additional stresses in the bearing, depends on the radial internal clearance of the bearing during operation, the bearing size, its internal design and the forces and moments acting on it. Exact values for permissible misalignment can't be given.

It should be noted that misalignment of the bearing rings causes an appreciable increase in noise level when the bearing is running.

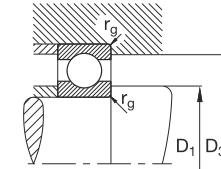
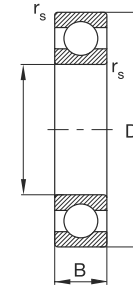
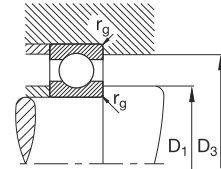
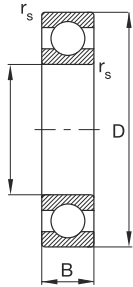
Designations

Supplementary designations (prefixes and suffixes) will be found at page **27**.



Radial internal clearance deep groove ball bearings

Bore diameter d [mm]		Radial internal clearance [µm]									
		C2		Normal		C3		C4		C5	
over	incl.	min	max	min	max	min	max	min	max	min	max
80	100	1	18	12	36	30	58	53	84	75	120
100	120	2	20	15	41	36	66	61	97	90	140
120	140	2	23	18	48	41	81	71	114	105	160
140	160	2	23	18	53	46	91	81	130	120	180
160	180	2	25	20	61	53	102	91	147	135	200
180	200	2	30	25	71	63	117	107	163	150	230
200	225	4	32	28	82	73	132	120	187	175	255
225	250	4	36	31	92	87	152	140	217	205	290
250	280	4	39	36	97	97	162	152	237	255	320
280	315	8	45	42	110	110	180	175	260	260	360
315	355	8	50	50	120	120	200	200	290	290	405
355	400	8	60	60	140	140	230	230	330	330	460
400	450	10	70	70	160	160	260	260	370	370	520
450	500	10	80	80	180	180	290	290	410	410	570
500	560	20	90	90	200	200	320	320	460	460	630
560	630	20	100	100	220	220	350	350	510	510	700
630	710	30	120	120	250	250	390	390	560	560	780
710	800	30	130	130	280	280	440	440	620	620	860
800	900	30	150	150	310	310	490	490	690	690	960
900	1.000	40	160	160	340	340	540	540	760	760	1.040
1.000	1.120	40	170	170	370	370	590	590	840	840	1.120



EVOLMEC							FAG		Load rating - Factor			Weight
d	D	B	r _s	D ₁	D ₃	r _g	CODE	CODE	dyn.	stat.		
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]			C	C ₀	f ₀	
150	229,5	35	2,1	160	220	2,1	EVSR 0100	538271	122	125	16,0	5,45
	230	35	2,1	160	220	2,1	EVSR 0101	506964	122	125	16,0	5,5
160	229,5	33	2	169	221	2	EVSR 0102	567422	102	114	16,5	4,34
	230	33	2	169	221	2	EVSR 0103	574960	102	114	16,4	4,38
180	259,5	33	2	189	251	2	EVSR 0104	507540	122	137	16,4	5,88
	269,5	33	2	199	261	2	EVSR 0105	502288	132	146	16,4	6,31
190	280	33	2	199	271	2	EVSR 0106	510452	132	146	16,4	7,45
	279,5	38	2,1	210	269	2,1	EVSR 0107	508728	150	166	16,4	7,17
200	289,5	38	2,1	210	270	2,1	EVSR 0108	502283	150	166	16,4	8,46
	309,5	38	2,1	230	290	2,1	EVSR 0109	800679 HA	176	204	16,4	9,19
220	309,5	38	2,1	230	290	2,1	EVSR 0110	507335	176	204	16,4	9,19
	329,5	40	2,1	240	319	2,1	EVSR 0111	508729	200	240	16,3	11,5
230	329,5	40	2,1	240	319	2,1	EVSR 0112	801656 HA	200	240	16,3	11,5
	329,5	40	2,1	250	319	2,1	EVSR 0113	578545	196	240	16,4	10,4
240	369,5	46	2,1	270	360	2,1	EVSR 0114	507338A	220	280	16,3	16,4
	389,5	46	2,1	290	380	2,1	EVSR 0115	507341	236	310	16,4	17,5
290	409,5	60	3	302	397	2,5	EVSR 0116	578599	310	425	15,9	26,2
	419,5	56	3	312	407	2,5	EVSR 0117	538205	285	400	16,2	24,4
330	460	56	3	352	448	2,5	EVSR 0118	509173	305	455	16,4	29,6
	479,5	60	3	352	467	2,5	EVSR 0119	538204	280	415	16,5	35,7
340	489,5	65	5	358	472	4	EVSR 0120	576368	345	510	16,2	40,9
	500	70	4	365	485	3	EVSR 0121	532002	355	550	16,3	44,3
360	550	85	5	378	532	4	EVSR 0122	533303	455	735	15,9	75,4
	519,5	65	4	397	505	3	EVSR 0123	576367	365	585	16,4	40,3

HA = retaining groove in the outer ring

EVOLMEC							FAG		Load rating - Factor			Weight
d	D	B	r _s	D ₁	D ₃	r _g	CODE	CODE	dyn.	stat.		
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]			C	C ₀	f ₀	
420	559,5	65	4	435	545	3	EVSR 0124	576366	390	655	16,5	45,6
	580	70	4	435	565	3	EVSR 0125	544178	380	640	16,5	57
500	700	100	6	523	677	5	EVSR 0126	530352	585	1.120	16,2	116
	760	100	6	553	737	5	EVSR 0127	508780 HA	600	1.160	16,3	158
530	780	112	6	553	757	5	EVSR 0128	529220 HA	710	1.400	16,0	190
	840	128	7,5	668	912	6	EVSR 0129	508308	815	1.760	16,2	327
650	920	118	6	673	897	5	EVSR 0130	514645	750	1.630	16,4	262
	850	85	6	693	827	5	EVSR 0131	509029	550	1.180	16,1	118
710	1000	140	7,5	738	972	6	EVSR 0132	502954	880	2.000	16,4	361
	1030	140	7,5	738	1002	6	EVSR 0133	534196 HA ¹⁾	1.020	2.320	16,0	394
	1080	160	7,5	785	1005	7,5	EVSR 0134	528283 HA ¹⁾	1.140	2.700	15,8	534
750	1016	125	6	773	993	5	EVSR 0135	565323 HA	830	2.000	16,4	312
	1080	150	7,5	788	1052	6	EVSR 0136	500909 HA	1.100	2.650	16,0	381
800	1080	115	6	823	1057	5	EVSR 0137	526190	865	2.080	16,4	313
	1150	155	7,5	828	1122	6	EVSR 0138	801911 HA	1.140	2.800	16,1	538
850	1220	165	7,5	878	1192	6	EVSR 0139	501657 HA ²⁾	1.220	3.150	16,2	629
	860	1130	120	7,5	888	1102	6	EVSR 0140	529055 HA	930	2.360	16,4

HA = retaining groove in the outer ring

¹⁾ Radial clearance C4; C3 clearance for the other bearings

²⁾ Radial clearance: 200 to 300 µm

Description

Two single row angular contact ball bearings, when duplexed back-to-back so that the inner ring forms one piece, are used to create double row angular contact ball bearings. Alternatively, the bearings may be duplexed face-to-face with the outer ring as one piece.

These bearings support radial and axial loads in either direction: back-to-back duplexed bearings also support moment loads.

Dimensions

The boundary dimensions of the bearings listed in the tables conform to **ISO 15:2017**.

Tolerances

Double row angular contact ball bearings are produced with normal tolerances (**P0**) as standard or with increased accuracy corresponding to tolerance classes **P6** and **P5** (where running tolerance is critical). Please contact our technical department to check the availability of bearings to **P6** and **P5** specifications.

Tolerances values, conform to **ISO 492:2014**, will be found in the tables from page 24 to page 25.

Internal clearance

Double row angular contact ball bearings are produced with normal axial internal clearance as standard. Most sizes are however also available with an internal clearance which is greater or smaller than normal.

For axial internal clearance values please contact **EVOLMEC** technical department.

Inner and outer rings

Material: Core hardened steel 100Cr6 (UNI 3097 – WNr. 1.3505) or 100CrMo7 (WNr.1.3507) according to the sizes.

On request and for special applications they can be manufactured in case-hardening steel.

Heat treatment: Annealing (annealing of workability), hardening and tempering.

These treatments will be always performed ensuring a stabilization **ST0** (for use of bearings without deformations of the rings up to

temperatures of 150°C).

On request these treatments can be performed ensuring a final stabilization **ST1** & **ST2**.

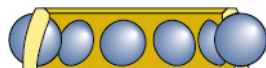
ST1- for functioning without deformations of the rings up to 200°C (**suffix ST1**)

ST2- for functioning without deformations of the rings up to 250°C (**suffix ST2**).

Hardness: 58/62 HRc

Cage

Double row angular contact ball bearings are normally provided with one of the following types of cages according to the range and dimensions:



Machined brass cage



Machined steel cage

Balls

Material: Core-hardened steel 100Cr6 (UNI 3097)

Heat treatment: Annealing (annealing of workability), hardening and tempering.

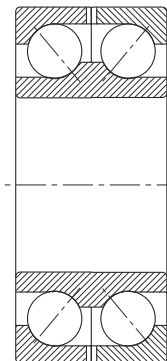
Hardness: 60/64 HRc

Designations

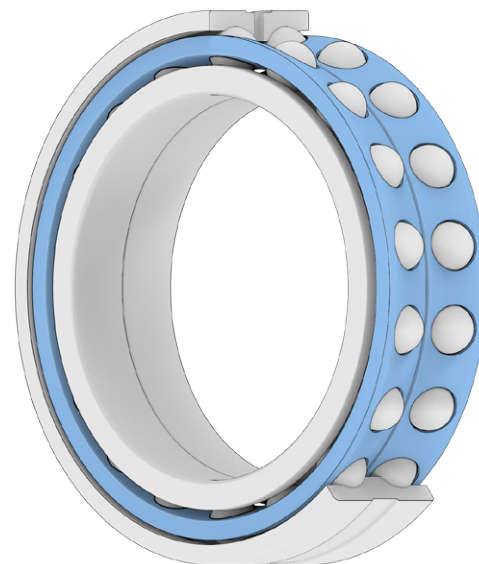
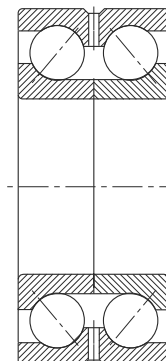
Supplementary designations (prefixes and suffixes) will be found at page 27.

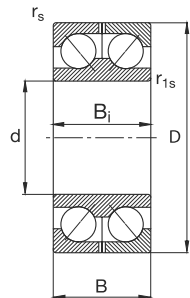
Executions

Execution 1
BACK-TO-BACK

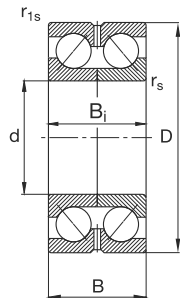


Execution 2
FACE-TO-FACE

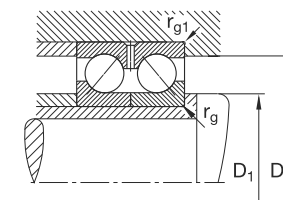
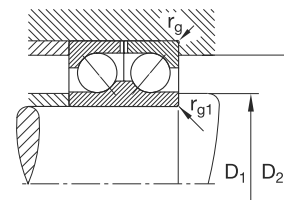




Execution 1



Execution 2



d	EVOLMEC										FAG		Load rating	Weight		
	D	B	Bi	rs	rs	D1	D2	rg	rg1	CODE	Execution	CODE			Execution	dyn. C
[mm]	[mm]	[mm]	[mm]	min	min	min	max	max	max					[kN]	[kN]	
100	170	60,3	60,3	2	2	111	159	2	2	EVSAD 0100	2	511044A	2	140	170	5,57
120	180	56	56	2	1	129	175	2	1	EVSAD 0101	2	541983	2	146	193	4,75
	190	66	66	2	2	131	179	2	2	EVSAD 0102	2	540889	2 Z	186	236	6,74
	190	66	66	2	2	131	179	2	2	EVSAD 0103	2	517458A	2	186	236	6,74
140	209,5	66	66	2	2	149	201	2	2	EVSAD 0104	2	538854	2	173	236	7,52
	225	70	70	2,1	2,1	160	215	2	2	EVSAD 0105	2	577243	2 HA	180	255	9,47
150	225	73	73	2,1	2,1	160	215	2,1	2,1	EVSAD 0106	2	568819	2 HA	180	255	8,89
	225	73	73	2,1	2,1	160	215	2,1	2,1	EVSAD 0107	2	510776A	2	180	255	9,89
	230	70	70	2,1	2,1	160	220	2,1	2,1	EVSAD 0108	2	506963	2	212	290	9,63
	230	70	70	2,1	2,1	160	220	2,1	2,1	EVSAD 0109	2	567620	2 HA	236	325	10,7
	240	84	84	1,5	1	155	233	1,5	1	EVSAD 0110	1	504083	1	240	335	15,8
	215	50	56	1,8	1,8	167	208	1,8	1,8	EVSAD 0111	2	514478	2	132	204	5,27
160	239,5	76	76	2,1	2	170	231	2,1	2	EVSAD 0112	2	537406	2	232	325	11,4
	240	76	76	2	2	169	231	2	2	EVSAD 0113	1	507511	1	232	325	12,3
	260	84	84	2,1	2,1	180	250	2,1	2,1	EVSAD 0114	1	503288	1	280	405	16,5
175	280	92	92	2,1	2,1	185	270	2,1	2,1	EVSAD 0115	1	506872	1	315	475	23,4
	250	66	66	2	2	189	241	2	2	EVSAD 0116	1	528711A	1	190	285	9,93
180	250	70	70	2	2	189	241	2	2	EVSAD 0117	1	508893A	1	190	285	10,4
	259,5	66	66	2	2	189	251	2	2	EVSAD 0118	2	509059A	2	196	305	11,9
	280	92	92	2	2	189	271	2	2	EVSAD 0119	2	566013	2 HA	290	430	20,1
	280	92	92	2,1	1,1	186	270	2,1	1,1	EVSAD 0120	1	503739	1	290	440	21,6

HA = retaining groove in the outer ring

Z = Separable bearing

d	EVOLMEC										FAG		Load rating	Weight		
	D	B	Bi	rs	rs	D1	D2	rg	rg1	CODE	Execution	CODE			Execution	dyn. C
[mm]	[mm]	[mm]	[mm]	min	min	min	max	max	max					[kN]	[kN]	
190	255	58	58	1,1	1,1	196	249	1,1	1,1	EVSAD 0121	2	514479	2	180	285	8,7
	269,5	66	66	2	2	199	261	2	2	EVSAD 0122	2	508658A	2	224	345	10,4
	290	92	92	2,1	1,1	196	280	2,1	1,1	EVSAD 0123	1	507510A	1	325	500	23,4
200	279,5	76	76	2,1	2,1	210	270	2,1	2,1	EVSAD 0124	2	508733A	2	245	380	14,3
	280	80	80	2,1	1,1	206	270	2,1	1,1	EVSAD 0125	1	507629	1	255	390	15,8
	289,5	76	76	2,1	2,1	210	280	2,1	2,1	EVSAD 0126	2	509590A	2	245	380	16,9
	289,5	76	76	2,1	2,1	210	280	2,1	2,1	EVSAD 0127	2	581040	2 HA	245	380	16,9
	289,5	76	76	2,1	1,1	206	280	2,1	1,1	EVSAD 0128	1	507448	1	245	380	17,9
	309,5	96	96	2,1	2,1	210	300	2,1	2,1	EVSAD 0129	2	538852	2	365	585	26,3
	310	96	96	2,1	2,1	210	300	2,1	2,1	EVSAD 0130	1	506871	1	365	585	28,3
220	300	70	76	1,1	1,1	226	294	1,1	1,1	EVSAD 0131	2	514480	2	265	430	14,6
	309,5	76	76	2	2	229	301	2	2	EVSAD 0132	2	511045A	2	255	405	17,5
	309,5	76	76	2	2	229	301	2	2	EVSAD 0133	2	567621	2 HA	285	465	17,6
230	329,5	80	80	2,1	2,1	240	320	2,1	2,1	EVSAD 0134	2	508732A	2	320	530	22,0
	329,5	80	80	2,1	1,1	236	320	2,1	1,1	EVSAD 0135	1	573446	1	320	530	23,9
250	340	70	76	2,1	1,5	260	333	2,1	1,5	EVSAD 0136	2	514481	2	300	510	18,9
	369,5	92	92	2,1	2,1	270	360	2,1	2,1	EVSAD 0137	2	508731A	2	390	695	30,5
260	400	130	130	4	4	277	383	4	4	EVSAD 0138	1	505057	1	540	1.020	61,5
	389,5	92	92	2,1	2,1	290	380	2,1	2,1	EVSAD 0139	2	508730A	2	405	750	32,5

HA = retaining groove in the outer ring

Z = Separable bearing

Description

Double direction tapered roller thrust bearings allow the realization of compact axial systems. The bearings of this type can support extremely heavy axial loads in both direction and they are insensitive to impacts.

They are mainly used to support the axial load on roll neck of rolling mills, in combination with multi-row cylindrical roller radial bearings.

Since double direction tapered roller thrust bearings are normally assembled with free coupling, both on the neck of the cylinder and on the housing of the crankset to prevent the rotation on the housing, the shaft washer is provided with one or two stopping carvings, where a key is inserted, or by similar means.

Dimensions

The boundary dimensions of tapered roller thrust bearings haven't been unified.

Tolerances

Except for some cases, these bearings are produced with normal tolerances (P0) as standard for the hole and the inner diameter. These values, conform to ISO 492:2014, will be found in the tables at page 26.

Tolerances on the height and on the rotation precision differ from normal values. On request values relating to a specific bearing can be provided.

Washers

Material: Core hardened steel 100Cr6 (UNI 3097 – WNr. 1.3505) or 100CrMo7 (WNr.1.3507) according to the sizes.

On request and for special applications they can be manufactured in case-hardening steel.

Heat treatment: Annealing (annealing of workability), hardening and tempering.

These treatments will be always performed ensuring a stabilization ST0 (for use of bearings without deformations of the rings up to temperatures of 150°C).

On request these treatments can be performed ensuring a final stabilization ST1 & ST2.

ST1- for functioning without deformations of the

rings up to 200°C (suffix ST1)

ST2- for functioning without deformations of the rings up to 250°C (suffix ST2).

Hardness: 58/62 HRc

Cage

Double direction tapered roller thrust bearings without full complement of rollers are provided with a massive brass cage or with steel pin-type cage. Bearings of ESB.2 & ESB.3 execution are provided with window-type steel cage.

Tapered rollers

Material: Core-hardened steel 100Cr6 (UNI 3097)

Heat treatment: Annealing (annealing of workability), hardening and tempering.

Hardness: 60/64 HRc

On request they can be manufactured in case-hardening steel (pierced rollers).

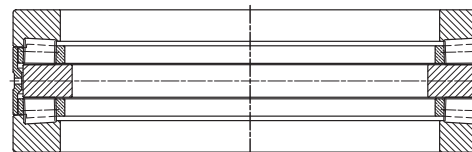
Designations

Supplementary designations (prefixes and suffixes) will be found at page 27.

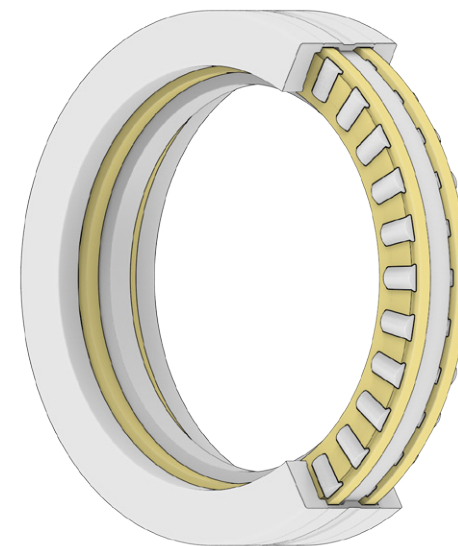
Executions

Two types of executions exist:

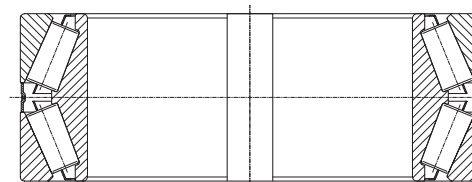
EXECUTION ESB.1



This execution, with plain central shaft washer, is the most common because it is able to withstand slight shaft eccentricity with respect to the housing bore. Between shaft washers for housing there is a spacer, proportioned so that it is possible to tighten fully the screws.

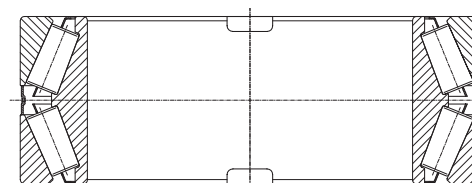


EXECUTIONS ESB.2 / ESB.3



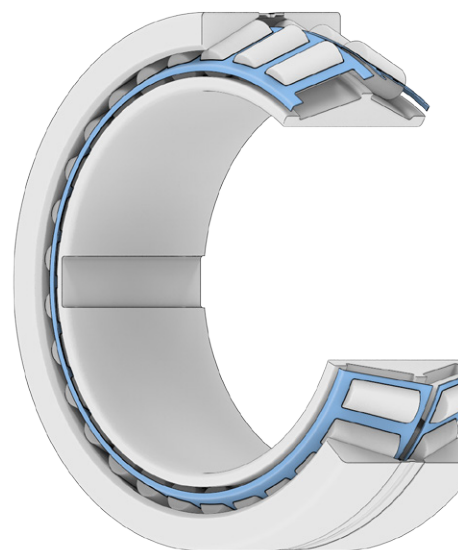
ESB.2

ONE STOPPING CARVING



ESB.3

TWO STOPPING CARVINGS



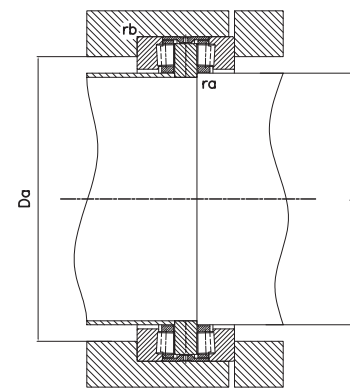
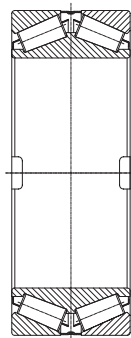
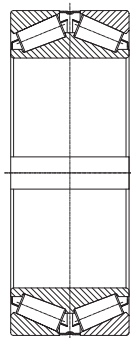
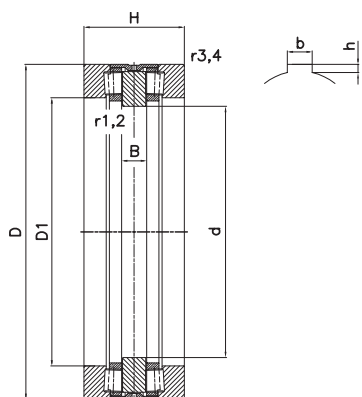
These executions have tapered raceways on the shaft washers. They have a greater load capacity than that with the plain central shaft washer and somehow they also can radially constrain the shaft.

Double direction tapered roller thrust bearings

Dimensional tables

Double direction tapered roller thrust bearings

Dimensional tables



EVOLMEC										EVOLMEC-SKF				SKF		FAG		Weight [kg]				
d	D	H	D ₁	B	b	h	Adjacent dimensions		CODE	Execution	Load rating		CODE	Execution	CODE	Load rating						
							r _{1,2} min	r _{3,4} min			da max	Da max				ra max	rb max		dyn. C	stat. C ₀	dyn. C	stat. C ₀
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]				
[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]					
[kg]																						
170	240	84	184	20	-	-	0,6	2	182	190	0,6	2	EVRC 0100	ESB.1	330	1.290	350980 C	BFD.1	528974	380	1.430	12,5
180	280	90	196	20	-	-	1	2	192	205	1	2	EVRC 0101	ESB.1	561	2.400	353162	BFD.1	528294	720	3.250	22
220	300	96	236	22	-	-	0,6	2	231	245	0,6	2	EVRC 0102	ESB.1	440	1.660	351019 C	BFD.1	528876	570	2.240	20
240	320	96	256	22	-	-	0,6	2	251	265	0,6	2	EVRC 0103	ESB.1	418	1.900	351182 C	BFD.1	529086	610	2.600	21,5
250	380	100	275	22	30	6,7	0,6	2	267	285	0,6	2	EVRC 0104	ESB.1	897	4.550	353005	BFD.1	522010	980	5.200	43,5
260	360	92	285	20	-	-	1	2	276	290	1	2	EVRC 0105	ESB.1	605	2.600	350981 C	BFD.1	509352	680	3.100	28
270	450	180	310	45	40	10	2	5	300	325	2	4	EVRC 0106	ESB.1	1.650	6.000	351164 C	BFD.1	527907	2.000	8.500	120
305,07	530	200	410	200	36,1	30	6,4	6,4	363	410	6	6	EVRC 0107	ESB.2	2.380	10.600	BFDB 353194/HB3	BFD.2	-	-	-	185
320	440	108	355	26	-	-	1,1	3	348	360	1	2,5	EVRC 0108	ESB.1	990	4.650	353102 C	BFD.1	528562	980	4.900	48,5
	470	130	350	30	-	-	1,1	3	340	360	1	2,5	EVRC 0109	ESB.1	1.300	5.700	350982 C	BFD.1	509654	1.340	6.550	80
350	490	130	390	30	-	-	1,1	3	380	400	1	2,5	EVRC 0110	ESB.1	1.170	5.100	351100 C	BFD.1	530739	1.320	6.700	73,5
	540	135	400	30	-	-	1,1	4	384	405	1	3	EVRC 0111	ESB.1	1.720	9.150	353006	BFD.1	522008	1.800	10.400	115
380	560	130	430	32	45	10	1,5	3	416	435	1,5	2,5	EVRC 0112	ESB.1	1.790	10.000	351175 C	BFD.1	513125	1.800	10.800	110
	650	215	450	65	55	10	2	4	446	470	2	3	EVRC 0113	ESB.1	3.360	16.600	BFDB 353204	BFD.1	545936	3.750	19.300	275
400	650	200	527	200	50,8	19	4	4	480	527	4	4	EVRC 0114	ESB.2	2.700	13.700	353106	BFD.2	-	-	-	235
	650	200	527	200	50,8	19	4	4	480	527	4	4	EVRC 0115	ESB.2	2.700	13.700	353106 C	BFD.2	-	-	-	235
	650	200	527	200	50,8	19	4	4	480	527	4	4	EVRC 0116	ESB.3	2.700	13.700	353106 D	BFD.3	-	-	-	230
420	620	170	465	35	56	10	1,5	3	455	485	1,5	3	EVRC 0117	ESB.1	2.420	12.200	351121 C	BFD.1	509392	2.280	12.000	185
	620	185	465	50	-	-	1,5	3	455	485	1,5	3	EVRC 0118	ESB.1	2.420	12.200	BFDB 353200/HA3	BFD.1	545991	2.280	12.000	200
440	645	167	490	50	45	11	3	4	480	510	2,5	3	EVRC 0119	ESB.1	1.980	10.800	353152	BFD.1	534038	2.240	12.700	190
450	645	155	490	38	45	11	4	4	480	510	3	3	EVRC 0120	ESB.1	1.980	10.800	350916 D	BFD.1	513401	2.240	12.700	170
	720	200	535	50	55	11	2	4	515	550	2	3	EVRC 0121	ESB.1	3.410	17.600	353151	BFD.1	509391	3.400	19.300	285
	720	200	535	40	55	10	2	4	515	550	2	3	EVRC 0122	ESB.1	3.410	17.600	351301 B	BFD.1	-	-	-	285
470	720	210	535	60	-	-	2	4	515	550	2	3	EVRC 0123	ESB.1	3.410	17.600	BFDB 353238/HA3	BFD.1	549701	3.400	19.300	305
	530	710	218	575	57	45	10	2	560	590	2	2,5	EVRC 0124	ESB.1	2.200	11.000	351475 C	BFD.1	511746	2.700	14.000	245
550	760	230	610	50	45	10	2	5	585	585	2	4	EVRC 0125	ESB.1	2.920	13.200	350976 C	BFD.1	515196	3.200	16.300	310
	880	290	680	70	-	-	5	6	670	670	4	5	EVRC 0126	ESB.1	4.730	21.200	BFDB 350824 B/HA1	BFD.1	-	-	-	550
600	910	290	680	70	45	12	5	6	670	670	4	5	EVRC 0127	ESB.1	4.730	21.200	350901 C	BFD.1	-	-	-	655
	670	900	230	725	50	45	12	2	705	705	2	4	EVRC 0128	ESB.1	3.580	19.000	351761 A	BFD.1	521823	3.800	21.200	425

RADIAL BEARINGS
NORMAL (P0), P6 and P5 TOLERANCES - **INNER RING**

Class P0 tolerances for radial bearings (except tapered roller bearings) [µm]

Inner ring d [mm]		Δ_{dmp}		V_{dp} Diametral series			V_{dmp} max	Δ_{Bs}		V_{Bs} max	K_{Ia} max
				8, 9 max	0, 1 max	2, 3, 4 max		high	low		
over	incl.	high	low	max	max	max	max	high	low	max	max
80	120	0	-20	25	25	15	15	0	-200	25	25
120	180	0	-25	31	31	19	19	0	-250	30	30
180	250	0	-30	38	38	23	23	0	-300	30	40
250	315	0	-35	44	44	26	26	0	-350	35	50
315	400	0	-40	50	50	30	30	0	-400	40	60
400	500	0	-45	56	56	34	34	0	-450	50	65
500	630	0	-50	63	63	38	38	0	-500	60	70
630	800	0	-75	-	-	-	-	0	-750	70	80
800	1.000	0	-100	-	-	-	-	0	-1000	80	90
1.000	1.250	0	-125	-	-	-	-	0	-1250	100	100
1.250	1.600	0	-160	-	-	-	-	0	-1600	120	120
1.600	2.000	0	-200	-	-	-	-	0	-2000	140	140

Class P6 tolerances for radial bearings (except tapered roller bearings) [µm]

Inner ring d [mm]		Δ_{dmp}		V_{dp} Diametral series			V_{dmp} max	Δ_{Bs}		V_{Bs} max	K_{Ia} max
				8, 9 max	0, 1 max	2, 3, 4 max		high	low		
over	incl.	high	low	max	max	max	max	high	low	max	max
80	120	0	-15	19	19	11	11	0	-200	25	13
120	180	0	-18	23	23	14	14	0	-250	30	18
180	250	0	-22	28	28	17	17	0	-300	30	20
250	315	0	-25	31	31	19	19	0	-350	35	25
315	400	0	-30	38	38	23	23	0	-400	40	30
400	500	0	-35	44	44	26	26	0	-450	45	35
500	630	0	-40	50	50	30	30	0	-500	50	40
630	800	0	-50	-	-	-	-	0	-750	55	45
800	1.000	0	-65	-	-	-	-	0	-1000	60	50
1.000	1.250	0	-80	-	-	-	-	0	-1250	70	60
1.250	1.600	0	-100	-	-	-	-	0	-1600	70	70
1.600	2.000	0	-130	-	-	-	-	0	-2000	80	80

Class P5 tolerances for radial bearings (except tapered roller bearings) [µm]

Inner ring d [mm]		Δ_{dmp}		V_{dp} Diametral series			V_{dmp} max	Δ_{Bs}		V_{Bs} max	K_{Ia} max	S_d max
				8, 9 max	0, 1, 2, 3, 4 max	high		low				
over	incl.	high	low	max	max	max	max	high	low	max	max	max
80	120	0	-10	10	8	5	5	0	-200	7	6	9
120	180	0	-13	13	10	7	7	0	-250	8	8	10
180	250	0	-15	15	12	8	8	0	-300	10	10	11
250	315	0	-18	18	14	9	9	0	-350	13	13	13
315	400	0	-23	23	18	12	12	0	-400	15	15	15
400	500	0	-27	28	21	14	14	0	-450	18	17	18
500	630	0	-33	35	26	18	18	0	-500	20	19	20
630	800	0	-40	-	-	-	-	0	-750	26	22	26
800	1.000	0	-50	-	-	-	-	0	-1000	32	26	32
1.000	1.250	0	-65	-	-	-	-	0	-1250	38	30	38
1.250	1.600	0	-80	-	-	-	-	0	-1600	45	35	45
1.600	2.000	0	-100	-	-	-	-	0	-2000	55	40	55

RADIAL BEARINGS
OUTER RING - NORMAL (P0), P6 and P5 TOLERANCES

Class P0 tolerances for radial bearings (except tapered roller bearings) [µm]

Outer ring D [mm]		Δ_{Dmp}		V_{Dp} Diametral series			V_{Dmp} max	K_{Oa} max
				8, 9 max	0, 1 max	2, 3, 4 max		
over	incl.	high	low	max	max	max	max	max
80	120	0	-15	19	19	11	11	35
120	150	0	-18	23	23	14	14	40
150	180	0	-25	31	31	19	19	45
180	250	0	-30	38	38	23	23	50
250	315	0	-35	44	44	26	26	60
315	400	0	-40	50	50	30	30	70
400	500	0	-45	56	56	34	34	80
500	630	0	-50	63	63	38	38	100
630	800	0	-75	94	94	55	55	120
800	1.000	0	-100	125	125	75	75	140
1.000	1.250	0	-125	-	-	-	-	160
1.250	1.600	0	-160	-	-	-	-	190
1.600	2.000	0	-200	-	-	-	-	220
2.000	2.500	0	-250	-	-	-	-	250

Class P6 tolerances for radial bearings (except tapered roller bearings) [µm]

Outer ring D [mm]		Δ_{Dmp}		V_{Dp} Diametral series			V_{Dmp} max	K_{Oa} max
				8, 9 max	0, 1 max	2, 3, 4 max		
over	incl.	high	low	max	max	max	max	max
80	120	0	-13	16	16	10	10	18
120	150	0	-15	19	19	11	11	20
150	180	0	-18	23	23	14	14	23
180	250	0	-20	25	25	15	15	25
250	315	0	-25	31	31	19	19	30
315	400	0	-28	35	35	21	21	35
400	500	0	-33	41	41	25	25	40
500	630	0	-38	48	48	29	29	50
630	800	0	-45	56	56	34	34	60
800	1.000	0	-60	75	75	45	45	75
1.000	1.250	0	-80	-	-	-	-	85
1.250	1.600	0	-100	-	-	-	-	100
1.600	2.000	0	-130	-	-	-	-	100
2.000	2.500	0	-160	-	-	-	-	120

Class P5 tolerances for radial bearings (except tapered roller bearings) [µm]

Outer ring D [mm]		Δ_{Dmp}		V_{Dp} Diametral series		V_{Dmp} max	V_{Cs} max	K_{Oa} max	S_D max
				8, 9 max	0, 1, 2, 3, 4 max				
over	incl.	high	low	max	max	max	max	max	max
80	120	0	-10	10	8	5	8	10	9
120	150	0	-11	11	8	6	8	11	10
150	180	0	-13	13	10	7	8	13	10
180	250	0	-15	15	11	8	10	15	11
250	315	0	-18	18	14	9	11	18	13
315	400	0	-20	20	15	10	13	20	13
400	500	0	-23	23	17	12	15	23	15
500	630	0	-28	28	21	14	18	25	18
630	800	0	-35	35	26	18	20	30	20
800	1.000	0	-40	50	29	25	25	35	25
1.000	1.250	0	-50	-	-	-	30	40	30
1.250	1.600	0	-65	-	-	-	35	45	35
1.600	2.000	0	-85	-	-	-	38	55	40
2.000	2.500	0	-110	-	-	-	45	65	50

TAPERED ROLLER THRUST BEARINGS
NORMAL (P0), P6 and P5 TOLERANCES

DESIGNATIONS
Supplementary designations: prefixes & suffixes

Class P0, P6, P5 tolerances for tapered roller thrust bearings [µm]

Shaft washer d [mm]		Δ_{dmp}		V_{dp}	Class P0 S_i	Class P6 S_i	Class P5 S_i
over	incl.	high	low	max	max	max	max
80	120	0	-20	15	15	8	4
120	180	0	-25	19	15	9	5
180	250	0	-30	23	20	10	5
250	315	0	-35	26	25	13	7
315	400	0	-40	30	30	15	7
400	500	0	-45	34	30	18	9
500	630	0	-50	38	35	21	11
630	800	0	-75	-	40	25	13
800	1.000	0	-100	-	45	30	15
1.000	1.250	0	-125	-	50	35	18
1.250	1.600	0	-160	-	60	40	21
1.600	2.000	0	-200	-	75	50	25

Class P0, P6, P5 tolerances for tapered roller thrust bearings [µm]

Housing washer D [mm]		Δ_{Dmp}		V_{Dp}	Class P0 S_e	Class P6 S_e	Class P5 S_e
over	incl.	high	low	max	max	max	max
80	120	0	-22	17	15	8	4
120	180	0	-25	19	15	9	5
180	250	0	-30	23	20	10	5
250	315	0	-35	26	25	13	7
315	400	0	-40	30	30	15	7
400	500	0	-45	34	30	18	9
500	630	0	-50	38	35	21	11
630	800	0	-75	55	40	25	13
800	1.000	0	-100	75	45	30	15
1.000	1.250	0	-125	-	50	35	18
1.250	1.600	0	-160	-	60	40	21
1.600	2.000	0	-200	-	75	50	25
2.000	2.500	0	-250	-	60	40	21

Class P0, P6, P5 tolerances for tapered roller thrust bearings [µm]

Bearing height d [mm]		Δ_{Ts}		Δ_{T1s}		Δ_{T2s}		Δ_{T3s}		Δ_{T4s}	
over	incl.	high	low	high	low	high	low	high	low	high	low
80	120	+25	-300	+150	-300	+200	-500	+400	-500	+25	-400
120	180	+25	-400	+150	-400	+200	-600	+400	-600	+25	-500
180	250	+30	-400	+150	-400	+250	-600	+500	-600	+30	-500
250	315	+40	-400	+200	-400	+350	-700	+600	-700	+40	-700
315	400	+40	-500	+200	-500	+350	-700	+600	-700	+40	-700
400	500	+50	-500	+300	-500	+400	-900	+750	-900	+50	-900
500	630	+60	-600	+350	-600	+500	-1.100	+900	-1.100	+60	-1.200
630	800	+70	-750	+400	-750	+600	-1.300	+1.100	-1.300	+70	-1.400
800	1.000	+80	-1.000	+450	-1.000	+700	-1.500	+1.300	-1.500	+80	-1.800
1.000	1.250	+100	-1.400	+500	-1.400	+900	-1.800	+1.600	-1.800	+100	-2.400

Prefixes

L	Removable inner ring of a multi-row cylindrical roller bearing
R	Outer ring, cage and rollers system of a multi-row cylindrical roller bearing

Suffixes

A1,A2,A3,A4	Changes of the inner execution
C2	Radial inner clearance lower than normal
C3	Radial inner clearance higher than normal
C4	Radial inner clearance higher than C3
CE	Inner rings and cemented outer rings
CEE	Outer cemented ring
CEI	Inner cemented ring
CER	Cemented inner and outer ring and cemented rollers
TB	Bainitic hardening for inner rings and outer rings
TBE	Bainitic hardening for outer rings
TBI	Bainitic hardening for inner rings
K	Tapered bore, taper 1:12 on diameter
K30	Tapered bore, taper 1:30 on diameter
P5	Dimensional and running accuracy according to ISO tolerance class 5
P6	Dimensional and running accuracy according to ISO tolerance class 6
2IRC	Group of two double-row bearings
SCA3	Annular groove and three lubrication holes on the outer ring
SCA6	Annular groove and six lubrication holes on the outer ring
SCA8	Annular groove and eight lubrication holes on the outer ring
SCF	Groove on faces
SCFI	Groove on the faces of the inner ring
SCFE	Groove on the faces of the outer ring
SV	Helical groove on the bore
ST0	Rings stabilized for functioning without deformations up to +150°C
ST1	Rings stabilized for functioning without deformations up to +200°C
ST2	Rings stabilized for functioning without deformations up to +250°C
M	Machined brass cage, ball centred
MA	Machined brass cage, outer ring centred
MB	Machined brass cage, inner ring centred



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Our Quality Management System has been developed in accordance with **ISO 9001:2015**.

In this way we can ensure **high-quality** processes and products to meet the specific needs of each of our clients.