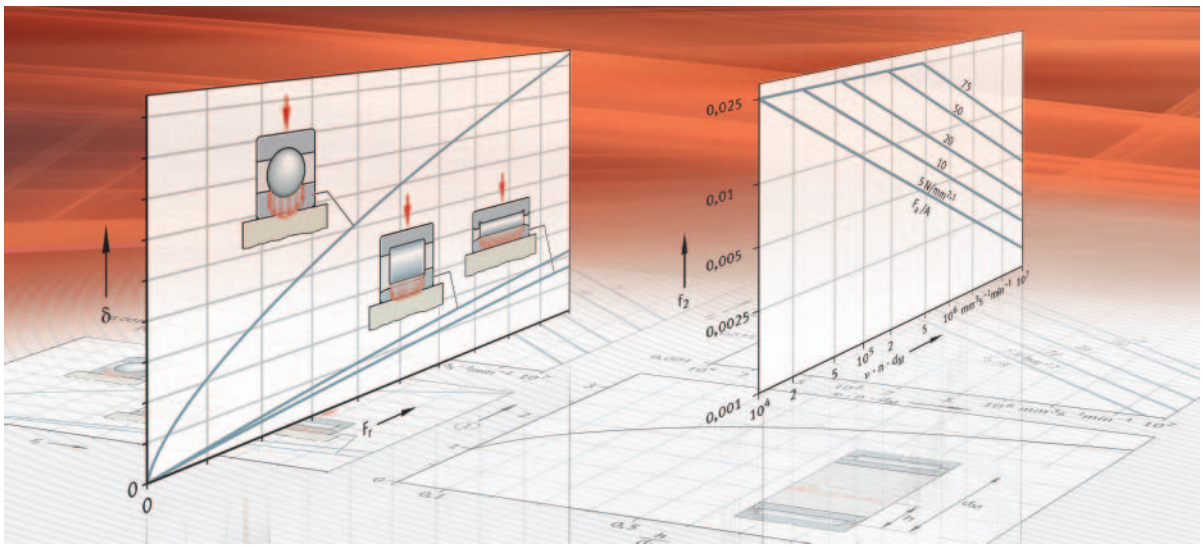


Tables

Tables

Dimension and tolerance symbols for radial rolling bearings in accordance with ISO 492:2014

Dimension symbol	Tolerance symbol	Description for radial bearings in accordance with ISO 492:2014	Old term in accordance with ISO 1132-1:2000
		Width	
B	–	Nominal inner ring width	Nominal inner ring width
	t_{VBs}	**Symmetrical rings** range of two-point sizes of inner ring width	Variation of inner ring width
		Asymmetrical rings range of minimum circumscribed sizes of inner ring width, between two opposite lines, obtained from any longitudinal section which includes the inner ring bore axis	
	$t_{\Delta Bs}$	**Symmetrical rings** deviation of a two-point size of inner ring width from its nominal size	Deviation of a single inner ring width
		Asymmetrical rings, upper limit deviation of a minimum circumscribed size of inner ring width, between two opposite lines, in any longitudinal section which includes the inner ring bore axis, from its nominal size	
		Asymmetrical rings, lower limit deviation of a two-point size of inner ring width from its nominal size	
C	–	Nominal outer ring width	Nominal outer ring width
	t_{VCs}	**Symmetrical rings** range of two-point sizes of outer ring width	Variation of outer ring width
		Asymmetrical rings range of minimum circumscribed sizes of outer ring width, between two opposite lines, obtained from any longitudinal section which includes the outer ring outside surface axis	
	$t_{\Delta Cs}$	**Symmetrical rings** deviation of a two-point size of outer ring width from its nominal size	Deviation of a single outer ring width
		Asymmetrical rings, upper limit deviation of a minimum circumscribed size of outer ring width, between two opposite lines, in any longitudinal section which includes the outer ring outside surface axis, from its nominal size	
		Asymmetrical rings, lower limit deviation of a two-point size of outer ring width from its nominal size	
C_1	–	Nominal outer ring flange width	Nominal outer ring flange width
	t_{VC1s}	Range of two-point sizes of outer ring flange width	Variation of outer ring flange width
	$t_{\Delta C1s}$	Deviation of a two-point size of outer ring flange width from its nominal size	Deviation of a single outer ring flange width

Dimension and tolerance symbols for radial rolling bearings in accordance with ISO 492:2014 (continued)

Dimension symbol	Tolerance symbol	Description for radial bearings in accordance with ISO 492:2014	Old term in accordance with ISO 1132-1:2000
		Diameter	
d	–	Nominal bore diameter of a cylindrical bore or at the theoretical small end of a tapered bore	Nominal bore diameter
	t_{Vdmp}	Range of mid-range sizes (out of two-point sizes) of bore diameter obtained from any cross-section of a cylindrical bore	Variation of mean bore diameter
	$t_{\Delta dmp}$	**Cylindrical bore** deviation of a mid-range size (out of two-point sizes) of bore diameter in any cross-section from its nominal size	Deviation of mean bore diameter in a single plane
		Tapered bore deviation of a mid-range size (out of two-point sizes) of bore diameter at the theoretical small end from its nominal size	
	t_{Vdsp}	Range of two-point sizes of bore diameter in any cross-section of a cylindrical or tapered bore	Variation of single bore diameter in a single plane
	$t_{\Delta ds}$	Deviation of a two-point size of bore diameter of a cylindrical bore from its nominal size	Deviation of a single bore diameter
d_1	–	Nominal diameter at the theoretical large end of a tapered bore	Diameter at the theoretical large end of a basically tapered bore
	$t_{\Delta d1mp}$	Deviation of a mid-range size (out of two-point sizes) of bore diameter at the theoretical large end of a tapered bore from its nominal size	Deviation of mean bore diameter in a single plane at the theoretical large end of a basically tapered bore
D	–	Nominal outside diameter	Nominal outside diameter
	t_{VDmp}	Range of mid-range sizes (out of two-point sizes) of outside diameter obtained from any cross-section	Variation of mean outside diameter
	$t_{\Delta Dmp}$	Deviation of a mid-range size (out of two-point sizes) of outside diameter in any cross-section from its nominal size	Deviation of mean outside diameter in a single plane
	t_{VDsp}	Range of two-point sizes of outside diameter in any cross-section	Variation of outside diameter in a single plane
	$t_{\Delta Ds}$	Deviation of a two-point size of outside diameter from its nominal size	Deviation of a single outside diameter
D_1	–	Nominal outside diameter of outer ring flange	Nominal outside diameter of outer ring flange
	$t_{\Delta D1s}$	Deviation of a two-point size of outside diameter of outer ring flange from its nominal size	Deviation of a single outside diameter of outer ring flange
		Tapered bore	
SL	–	Taper slope is the difference between nominal diameters at the theoretical large end and small end of a tapered bore ($SL = d_1 - d$)	–
	$t_{\Delta SL}$	Deviation of taper slope of a tapered inner ring bore from its nominal size ($\Delta SL = \Delta d1mp - \Delta dmp$)	–
α	–	Frustum angle of tapered inner ring bore (description based on ISO 1119)	–

Dimension and tolerance symbols for radial rolling bearings in accordance with ISO 492:2014 (continued)

Dimension symbol	Tolerance symbol	Description for radial bearings in accordance with ISO 492:2014	Old term in accordance with ISO 1132-1:2000
		Width of assembled bearing	
T	–	Nominal assembled bearing width	Assembled bearing width
	$t_{\Delta Ts}$	Deviation of minimum circumscribed size of assembled bearing width from its nominal size	Deviation of the actual (assembled) bearing width
T_1	–	Nominal effective width of inner subunit assembled with a master outer ring	Effective width of the inner subunit assembled with a master outer ring
	$t_{\Delta T1s}$	Deviation of minimum circumscribed size of effective width (inner subunit assembled with a master outer ring) from its nominal size	Nominal effective width of outer ring assembled with a master inner subunit
T_2	–	Effective width of outer ring assembled with a master inner subunit	Effective nominal width size of the outer ring, paired with an inner master unit
	$t_{\Delta T2s}$	Deviation of minimum circumscribed size of effective width (outer ring assembled with a master inner subunit) from its nominal size	Deviation of the actual effective width of outer ring assembled with a master inner subunit
T_F	–	Nominal assembled flanged bearing width	–
	$t_{\Delta TFs}$	Deviation of minimum circumscribed size of assembled flanged bearing width from its nominal size	–
T_{F2}	–	Nominal effective width of flanged outer ring assembled with a master inner subunit	–
	$t_{\Delta TF2s}$	Deviation of minimum circumscribed size of effective width (flanged outer ring assembled with a master inner subunit) from its nominal size	–
		Running accuracy	
	t_{Kea}	Circular radial run-out of outer ring outside surface of assembled bearing with respect to datum, i.e. axis, established from the inner ring bore surface	Radial run-out of outer ring of assembled bearing
	t_{Kia}	Circular radial run-out of inner ring bore of assembled bearing with respect to datum, i.e. axis, established from the outer ring outside surface	Radial run-out of inner ring of assembled bearing
	t_{Sd}	Circular axial run-out of inner ring face with respect to datum, i.e. axis, established from the inner ring bore surface	Perpendicularity of inner ring face with respect to the bore
	t_{SD}	Perpendicularity of outer ring outside surface axis with respect to datum established from the outer ring face	Perpendicularity of outer ring outside surface with respect to the face
	t_{SD1}	Perpendicularity of outer ring outside surface axis with respect to datum established from the outer ring flange back face	Perpendicularity of outer ring outside surface with respect to the flange back face
	t_{Sea}	Circular axial run-out of outer ring face of assembled bearing with respect to datum, i.e. axis, established from the inner ring bore surface	Axial run-out of outer ring of assembled bearing
	t_{Sea1}	Circular axial run-out of outer ring flange back face of assembled bearing with respect to datum, i.e. axis, established from the inner ring bore surface	Axial run-out of outer ring flange back face of assembled bearing
	t_{Sia}	Circular axial run-out of inner ring face of assembled bearing with respect to datum, i.e. axis, established from the outer ring outside surface	Axial run-out of inner ring of assembled bearing

Dimension and tolerance symbols for axial rolling bearings in accordance with ISO 199:2014

Dimension symbol	Tolerance symbol	Description for axial bearings in accordance with ISO 199:2014	Old term in accordance with ISO 1132-1:2000
		Diameter	
d	–	Nominal bore diameter of shaft washer, single-direction bearing	Nominal bore diameter of shaft washer
	$t_{\Delta dmp}$	Deviation of a mid-range size (out of two-point sizes) of shaft washer bore diameter in any cross-section from its nominal size	Deviation of mean bore diameter in a single plane
	t_{Vdsp}	Range of two-point sizes of shaft washer bore diameter in any cross-section	Variation of single bore diameter in a single plane
d_2	–	Nominal bore diameter of central shaft washer, double-direction bearing	Nominal bore diameter of central shaft washer
	$t_{\Delta d2mp}$	Deviation of a mid-range size (out of two-point sizes) of central shaft washer bore diameter in any cross-section from its nominal size	Deviation of mean bore diameter in a single plane
	t_{Vd2sp}	Range of two-point sizes of central shaft washer bore diameter in any cross-section	Variation of single bore diameter in a single plane
D	–	Nominal outside diameter of housing washer	Nominal outside diameter of housing washer
	$t_{\Delta Dmp}$	Deviation of a mid-range size (out of two-point sizes) of housing washer outside diameter in any cross-section from its nominal size	Deviation of mean outside diameter in a single plane
	t_{VDsp}	Range of two-point sizes of housing washer outside diameter in any cross-section	Variation of outside diameter in a single plane
		Height	
T	–	Nominal assembled bearing height, single-direction bearing	Nominal bearing height
	$t_{\Delta Ts}$	Deviation of minimum circumscribed size of assembled bearing height from its nominal size, single-direction bearing	Deviation of the actual bearing height
T_1	–	Nominal assembled bearing height, double-direction bearing	Nominal bearing height
	$t_{\Delta T1s}$	Deviation of minimum circumscribed size of assembled bearing height from its nominal size, double-direction bearing	Deviation of the actual bearing height
	t_{Se}	**Axial cylindrical roller bearings:** range of two-point sizes of thickness between housing washer raceway and the back face	Variation in thickness between housing washer raceway and back face
		Axial ball bearings: range of minimum spherical sizes between the raceway and the opposite back face of the housing washer	
	t_{Si}	**Axial cylindrical roller bearings:** range of two-point sizes of thickness between shaft washer raceway and the back face	Variation in thickness between shaft washer raceway and back face
		Axial ball bearings: range of minimum spherical sizes between the raceway and the opposite back face of the shaft washer	

Shaft and housing fits

Shaft and housing fits

Shaft fits

	Nominal shaft diameter in mm				
	over **3**	**6**	**10**	**18**	**30**
	incl. **6**	**10**	**18**	**30**	**50**
	Deviation of bearing bore diameter in µm (normal tolerance)				
Δ_{dmp}	0 −8	0 −8	0 −8	0 −10	0 −12
	Shaft deviation, fit interference or fit clearance in µm				
e7	−20 −32	−25 −40	−32 −50	−40 −61	−50 −75
e8	−20 −38	−25 −47	−32 −59	−40 −73	−50 −89
f6	−10 −18	−13 −22	−16 −27	−20 −33	−25 −41
f7	−10 −22	−13 −28	−16 −34	−20 −41	−25 −50
g5	−4 −9	−5 −11	−6 −14	−7 −16	−9 −20
g6	−4 −12	−5 −14	−6 −17	−7 −20	−9 −25
h5	0 −5	0 −6	0 −8	0 −9	0 −11
h6	0 −8	0 −9	0 −11	0 −13	0 −16
j5	+3 −2	+4 −2	+5 −3	+5 −4	+6 −5
j6	+6 −2	+7 −2	+8 −3	+9 −4	+11 −5
js3	+1,25 +1,25	+1,25 +1,25	+1,5 +1,5	+2 −2	+2 −2
js4	+2 −2	+2 −2	+2,5 +2,5	+3 −3	+3,5 +3,5
js5	+2,5 −2,5	+3 −3	+4 −4	+4,5 −4,5	+5,5 −5,5
js6	+4 −4	+4,5 −4,5	+5,5 −5,5	+6,5 −6,5	+8 −8
k3	+2,5 0	+2,5 0	+3 0	+4 0	+4 0
k4	+5 +1	+5 +1	+6 +1	+8 +2	+9 +2
k5	+6 +1	+7 +1	+9 +1	+11 +2	+13 +2
k6	+9 +1	+10 +1	+12 +1	+15 +2	+18 +2

50 65	65 80	80 100	100 120	120 140	140 160	160 180	180 200	200 225	225 250	250 280	280 315
0 −15	0 −15	0 −20	0 −20	0 −25	0 −25	0 −25	0 −30	0 −30	0 −30	0 −35	0 −35
−60 −90	−60 −90	−72 −107	−72 −107	−85 −125	−83 −125	−85 −125	−100 −146	−100 −146	−100 −146	−110 −162	−110 −162
−60 −106	−60 −106	−72 −126	−72 −126	−85 −148	−85 −148	−85 −148	−100 −172	−100 −172	−100 −172	−110 −191	−110 −191
−30 −49	−30 −49	−36 −58	−36 −58	−43 −68	−43 −68	−43 −68	−50 −79	−50 −79	−50 −79	−56 −88	−56 −88
−30 −60	−30 −60	−36 −71	−36 −71	−43 −83	−43 −83	−43 −83	−50 −96	−50 −96	−50 −96	−56 −108	−56 −108
−10 −23	−10 −23	−12 −27	−12 −27	−14 −32	−14 −32	−14 −32	−15 −35	−15 −35	−15 −35	−17 −40	−17 −40
−10 −29	−10 −29	−12 −34	−12 −34	−14 −39	−14 −39	−14 −39	−15 −44	−15 −44	−15 −44	−17 −49	−17 −49
0 −13	0 −13	0 −15	0 −15	0 −18	0 −18	0 −18	0 −20	0 −20	0 −20	0 −23	0 −23
0 −19	0 −19	0 −22	0 −22	0 −25	0 −25	0 −25	0 −29	0 −29	0 −29	0 −32	0 −32
+6 −7	+6 −7	+6 −9	+6 −9	+7 −11	+7 −11	+7 −11	+7 −13	+7 −13	+7 −13	+7 −16	+7 −16
+12 −7	+12 −7	+13 −9	+13 −9	+14 −11	+14 −11	+14 −11	+16 −13	+16 −13	+16 −13	+16 −16	+16 −16
+2,5 +2,5	+2,5 +2,5	+3 −3	+3 −3	+4 −4	+4 −4	+4 −4	+5 −5	+5 −5	+5 −5	+6 −6	+6 −6
+4 −4	+4 −4	+5 −5	+5 −5	+6 −6	+6 −6	+6 −6	+7 −7	+7 −7	+7 −7	+8 −8	+8 −8
+6,5 −6,5	+6,5 −6,5	+7,5 −7,5	+7,5 −7,5	+9 −9	+9 −9	+9 −9	+10 −10	+10 −10	+10 −10	+11,5 −11,5	+11,5 −11,5
+9,5 −9,5	+9,5 −9,5	+11 −11	+11 −11	+12,5 −12,5	+12,5 −12,5	+12,5 −12,5	+14,5 −14,5	+14,5 −14,5	+14,5 −14,5	+16 −16	+16 −16
+5 0	+5 0	+6 0	+6 0	+8 0	+8 0	+8 0	+10 0	+10 0	+10 0	+12 0	+12 0
+10 +2	+10 +2	+13 +3	+13 +3	+15 +3	+15 +3	+15 +3	+18 +4	+18 +4	+18 +4	+20 +4	+20 +4
+15 +2	+15 +2	+18 +3	+18 +3	+21 +3	+21 +3	+21 +3	+24 +4	+24 +4	+24 +4	+27 +4	+27 +4
+21 +2	+21 +2	+25 +3	+25 +3	+28 +3	+28 +3	+28 +3	+33 +4	+33 +4	+33 +4	+36 +4	+36 +4

Shaft and housing fits

Shaft fits
(continued)

	Nominal shaft diameter in mm			
	over **315** incl. **355**	**355** **400**	**400** **450**	**450** **500**
	Deviation of bearing bore diameter in μm (normal tolerance)			
Δ_{dmp}	0 −40	0 −40	0 −45	0 −45
	Shaft deviation, fit interference or fit clearance in μm			
e7	−125 −182	−125 −182	−135 −198	−135 −198
e8	−125 −214	−125 −214	−135 −232	−135 −232
f6	−62 −98	−62 −98	−68 −108	−68 −108
f7	−62 −119	−62 −119	−68 −131	−68 −131
g5	−18 −43	−18 −43	−20 −47	−20 −47
g6	−18 −54	−18 −54	−20 −60	−20 −60
h5	0 −25	0 −25	0 −27	0 −27
h6	0 −36	0 −36	0 −40	0 −40
j5	+7 −18	+7 −18	+7 −20	+7 −20
j6	+18 −18	+18 −18	+20 −20	+20 −20
js3	+6,5 −6,5	+6,5 −6,5	+7,5 −7,5	+7,5 −7,5
js4	+9 −9	+9 −9	+10 −10	+10 −10
js5	+12,5 −12,5	+12,5 −12,5	+13,5 −13,5	+13,5 −13,5
js6	+18 −18	+18 −18	+20 −20	+20 −20
k3	+13 0	+13 0	+15 0	+15 0
k4	+22 +4	+22 +4	+25 +5	+25 +5
k5	+29 +4	+29 +4	+32 +5	+32 +5
k6	+40 +4	+40 +4	+45 +5	+45 +5

500 **560**	**560** **630**	**630** **710**	**710** **800**	**800** **900**	**900** **1 000**	**1 000** **1 120**	**1 120** **1 250**
0 −50	0 −50	0 −75	0 −75	0 −100	0 −100	0 −125	0 −125
−145 −215	−145 −215	−160 −240	−160 −240	−170 −260	−170 −260	−195 −300	−195 −300
−145 −255	−145 −255	−160 −285	−160 −285	−170 −310	−170 −310	−195 −360	−195 −360
−76 −120	−76 −120	−80 −130	−80 −130	−86 −142	−86 −142	−98 −164	−98 −164
−76 −146	−76 −146	−80 −160	−80 −160	−86 −176	−86 −176	−98 −203	−98 −203
−22 −51	−22 −51	−24 −56	−24 −56	−26 −62	−26 −62	−28 −70	−28 −70
−22 −66	−22 −66	−24 −74	−24 −74	−26 −82	−26 −82	−28 −94	−28 −94
0 −29	0 −29	0 −32	0 −32	0 −36	0 −36	0 −42	0 −42
0 −44	0 −44	0 −50	0 −50	0 −56	0 −56	0 −66	0 −66
–	–	–	–	–	–	–	–
+22 −22	+22 −22	+25 −25	+25 −25	+28 −28	+28 −28	+33 −33	+33 −33
–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–
+14,5 −14,5	+14,5 −14,5	+16 −16	+16 −16	+18 −18	+18 −18	+21 −21	+21 −21
+22 −22	+22 −22	+25 −25	+25 −25	+28 −28	+28 −28	+33 −33	+33 −33
–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–
+29 0	+29 0	+32 0	+32 0	+36 0	+36 0	+42 0	+42 0
+44 0	+44 0	+50 0	+50 0	+56 0	+56 0	+66 0	+66 0

Shaft and housing fits

Shaft fits
(continued)

	Nominal shaft diameter in mm				
	over **3** incl. **6**	**6** **10**	**10** **18**	**18** **30**	**30** **50**
	Deviation of bearing bore diameter in μm (normal tolerance)				
Δ_{dmp}	0 −8	0 −8	0 −8	0 −10	0 −12
	Shaft deviation, fit interference or fit clearance in μm				
m5	+9 +4	+12 +6	+15 +7	+17 +8	+20 +9
m6	+12 +4	+15 +6	+18 +7	+21 +8	+25 +9
n5	+13 +8	+16 +10	+20 +12	+24 +15	+28 +17
n6	+16 +8	+19 +10	+23 +12	+28 +15	+33 +17
p6	+20 +12	+24 +15	+29 +18	+35 +22	+42 +26
p7	+24 +12	+30 +15	+36 +18	+43 +22	+51 +26
r6	+23 +15	+28 +19	+34 +23	+41 +28	+50 +34
r7	+27 +15	+34 +19	+41 +23	+49 +28	+59 +34
s6	+27 +19	+32 +23	+39 +28	+48 +35	+59 +43
s7	+31 +19	+38 +23	+46 +28	+56 +35	+68 +43
Shaft tolerances for adapter sleeves and withdrawal sleeves					
h7/ $\frac{IT5}{2}$	0 −12 *2,5*	0 −15 *3*	0 −18 *4*	0 −21 *4,5*	0 −25 *5,5*
h8/ $\frac{IT5}{2}$	0 −18 *2,5*	0 −22 *3*	0 −27 *4*	0 −33 *4,5*	0 −39 *5,5*
h9/ $\frac{IT6}{2}$	0 −30 *4*	0 −36 *4,5*	0 −43 *5,5*	0 −52 *6,5*	0 −62 *8*
h10/	0 −48 *6*	0 −58 *7,5*	0 −70 *9*	0 −84 *10,5*	0 −100 *12,5*

The cylindricity tolerance t_1 (values printed in *italic*) relates to the radius (DIN ISO 1101).
When measuring the shaft diameter, the tolerance values should be doubled.
For general machine building, the values h7 or h8 should be used in preference.

50 **65**	**65** **80**	**80** **100**	**100** **120**	**120** **140**	**140** **160**	**160** **180**	**180** **200**	**200** **225**	**225** **250**	**250** **280**	**280** **315**
0 −15	0 −15	0 −20	0 −20	0 −25	0 −25	0 −25	0 −30	0 −30	0 −30	0 −35	0 −35
+24 +11	+24 +11	+28 +13	+28 +13	+33 +15	+33 +15	+33 +15	+37 +17	+37 +17	+37 +17	+43 +20	+43 +20
+30 +11	+30 +11	+35 +13	+35 +13	+40 +15	+40 +15	+40 +15	+46 +17	+46 +17	+46 +17	+52 +20	+52 +20
+33 +20	+33 +20	+38 +23	+38 +23	+45 +27	+45 +27	+45 +27	+51 +31	+51 +31	+51 +31	+57 +34	+57 +34
+39 +20	+39 +20	+45 +23	+45 +23	+52 +27	+52 +27	+52 +27	+60 +31	+60 +31	+60 +31	+66 +34	+66 +34
+51 +32	+51 +32	+59 +37	+59 +37	+68 +43	+68 +43	+68 +43	+79 +50	+79 +50	+79 +50	+88 +56	+88 +56
+62 +32	+62 +32	+72 +37	+72 +37	+83 +43	+83 +43	+83 +43	+96 +50	+96 +50	+96 +50	+108 +56	+108 +56
+60 +41	+62 +43	+73 +51	+76 +54	+88 +63	+90 +65	+93 +68	+106 +77	+109 +80	+113 +84	+126 +94	+130 +98
+71 +41	+73 +43	+86 +51	+89 +54	+103 +63	+105 +65	+108 +68	+123 +77	+126 +80	+130 +84	+146 +94	+150 +98
+72 +53	+78 +59	+93 +71	+101 +79	+117 +92	+125 +100	+133 +108	+151 +122	+126 +80	+130 +84	+146 +94	+150 +98
+83 +53	+89 +59	+106 +71	+114 +79	+132 +92	+140 +100	+148 +108	+168 +122	+126 +80	+130 +84	+146 +94	+150 +98
0 −30 *6,5*	0 −30 *6,5*	0 −35 *7,5*	0 −35 *7,5*	0 −40 *9*	0 −40 *9*	0 −40 *9*	0 −46 *10*	0 −46 *10*	0 −46 *10*	0 −52 *11,5*	0 −52 *11,5*
0 −46 *6,5*	0 −46 *6,5*	0 −54 *7,5*	0 −54 *7,5*	0 −63 *9*	0 −63 *9*	0 −63 *9*	0 −72 *10*	0 −72 *10*	0 −72 *10*	0 −81 *11,5*	0 −81 *11,5*
0 −74 *9,5*	0 −74 *9,5*	0 −87 *11*	0 −87 *11*	0 −100 *12,5*	0 −100 *12,5*	0 −100 *12,5*	0 −115 *14,5*	0 −115 *14,5*	0 −115 *14,5*	0 −130 *16*	0 −130 *16*
0 −120 *15*	0 −120 *15*	0 −140 *17,5*	0 −140 *17,5*	0 −160 *20*	0 −160 *20*	0 −160 *20*	0 −185 *23*	0 −185 *23*	0 −185 *23*	0 −210 *26*	0 −210 *26*

Shaft fits
(continued)

	Nominal shaft diameter in mm			
	over **315** incl. **355**	**355** **400**	**400** **450**	**450** **500**
	Deviation of bearing bore diameter in μm (normal tolerance)			
Δ_{dmp}	0 −40	0 −40	0 −45	0 −45
	Shaft deviation, fit interference or fit clearance in μm			
m5	+46 +21	+46 +21	+50 +23	+50 +23
m6	+57 +21	+57 +21	+63 +23	+63 +23
n5	+62 +37	+62 +37	+67 +40	+67 +40
n6	+73 +37	+73 +37	+80 +40	+80 +40
p6	+98 +62	+98 +62	+108 +68	+108 +68
p7	+119 +62	+119 +62	+131 +68	+131 +68
r6	+144 +108	+150 +114	+166 +126	+172 +132
r7	+165 +108	+171 +114	+189 +126	+195 +132
s6	+165 +108	+171 +114	+189 +126	+195 +132
s7	+165 +108	+171 +114	+189 +126	+195 +132
Shaft tolerances for adapter sleeves and withdrawal sleeves				
h7/ $\frac{IT5}{2}$	0 −57 *12,5*	0 −57 *12,5*	0 −63 *13,5*	0 −63 *13,5*
h8/ $\frac{IT5}{2}$	0 −89 *12,5*	0 −89 *12,5*	0 −97 *13,5*	0 −97 *13,5*
h9/ $\frac{IT6}{2}$	0 −140 *18*	0 −140 *18*	0 −155 *20*	0 −155 *20*
h10/	0 −230 *28,5*	0 −230 *28,5*	0 −250 *31,5*	0 −250 *31,5*

The cylindricity tolerance t_1 (values printed in *italic*) relates to the radius (DIN ISO 1101).
When measuring the shaft diameter, the tolerance values should be doubled.
For general machine building, the values h7 or h8 should be used in preference.

500 **560**	**560** **630**	**630** **710**	**710** **800**	**800** **900**	**900** **1 000**	**1 000** **1 120**	**1 120** **1 250**
0 −50	0 −50	0 −75	0 −75	0 −100	0 −100	0 −125	0 −125
+55 +26	+55 +26	+62 +30	+62 +30	+70 +34	+70 +34	+82 +40	+82 +40
+70 +26	+70 +26	+80 +30	+80 +30	+90 +34	+90 +34	+106 +40	+106 +40
+73 +44	+73 +44	+82 +50	+82 +50	+92 +56	+92 +56	+108 +66	+108 +66
+88 +44	+88 +44	+100 +50	+100 +50	+112 +56	+112 +56	+132 +66	+132 +66
+122 +78	+122 +78	+138 +88	+138 +88	+156 +100	+156 +100	+186 +120	+186 +120
+148 +78	+148 +78	+168 +88	+168 +88	+190 +100	+190 +100	+225 +120	+225 +120
+194 +150	+199 +155	+225 +175	+235 +185	+266 +210	+276 +220	+316 +250	+326 +260
+220 +150	+225 +155	+255 +175	+265 +185	+300 +210	+310 +220	+355 +250	+365 +260
+220 +150	+225 +155	+255 +175	+265 +185	+300 +210	+310 +220	+355 +250	+365 +260
+220 +150	+225 +155	+255 +175	+265 +185	+300 +210	+310 +220	+355 +250	+365 +260
0 −70 *14,5*	0 −70 *14,5*	0 −80 *16*	0 −80 *16*	0 −90 *18*	0 −90 *18*	0 −105 *21*	0 −105 *21*
0 −110 *14,5*	0 −110 *14,5*	0 −125 *16*	0 −125 *16*	0 −140 *18*	0 −140 *18*	0 −165 *21*	0 −165 *21*
0 −175 *22*	0 −175 *22*	0 −200 *25*	0 −200 *25*	0 −230 *28*	0 −230 *28*	0 −260 *33*	0 −260 *33*
0 −280 *35*	0 −280 *35*	0 −320 *40*	0 −320 *40*	0 −360 *45*	0 −360 *45*	0 −420 *52,5*	0 −420 *52,5*

Shaft and housing fits

Housing fits

	Nominal housing bore diameter in mm				
	over **6** incl. **10**	**10** **18**	**18** **30**	**30** **50**	**50** **80**
	Deviation of bearing outside diameter in μm (normal tolerance)				
Δ_{Dmp}	0 −8	0 −8	0 −9	0 −11	0 −13
	Housing deviation, fit interference or fit clearance in μm				
D10	+98 +40	+120 +50	+149 +65	+180 +80	+220 +100
E8	+47 +25	+59 +32	+73 +40	+89 +50	+106 +60
F7	+28 +13	+34 +16	+41 +20	+50 +25	+60 +30
G6	+14 +5	+17 +6	+20 +7	+25 +9	+29 +10
G7	+20 +5	+24 +6	+28 +7	+34 +9	+40 +10
H5	+6 0	+8 0	+9 0	+11 0	+13 0
H6	+9 0	+11 0	+13 0	+16 0	+19 0
H7	+15 0	+18 0	+21 0	+25 0	+30 0
H8	+22 0	+27 0	+33 0	+39 0	+46 0
J6	+5 −4	+6 −5	+8 −5	+10 −6	+13 −6
J7	+8 −7	+10 −8	+12 −9	+14 −11	+18 −12
JS4	+2 −2	+2,5 −2,5	+3 −3	+3,5 −3,5	+4 −4
JS5	+3 −3	+4 −4	+4,5 −4,5	+5,5 −5,5	+6,5 −6,5
JS6	+4,5 −4,5	+5,5 −5,5	+6,5 −6,5	+8 −8	+9,5 −9,5
JS7	+7,5 −7,5	+9 −9	+10,5 −10,5	+12,5 −12,5	+15 −15

80 120	120 150	150 180	180 250	250 315	315 400	400 500	500 630	630 800	800 1 000	1 000 1 250	1 250 1 600
0 −15	0 −18	0 −25	0 −30	0 −35	0 −40	0 −45	0 −50	0 −75	0 −100	0 −125	0 −160
+260 +120	+305 +145	+305 +145	+355 +170	+400 +190	+440 +210	+480 +230	+540 +260	+610 +290	+680 +320	+770 +350	+890 +390
+126 +72	+148 +85	+148 +85	+172 +100	+191 +110	+214 +125	+232 +135	+255 +145	+285 +160	+310 +170	+360 +195	+415 +220
+71 +36	+83 +43	+83 +43	+96 +50	+108 +56	+119 +62	+131 +68	+146 +76	+160 +80	+176 +86	+203 +98	+235 +110
+34 +12	+39 +14	+39 +14	+44 +15	+49 +17	+54 +18	+60 +20	+66 +22	+74 +24	+82 +26	+94 +28	+108 +30
+47 +12	+54 +14	+54 +14	+61 +15	+69 +17	+75 +18	+83 +20	+92 +22	+104 +24	+116 +26	+133 +28	+155 +30
+15 0	+18 0	+18 0	+20 0	+23 0	+25 0	+27 0	–	–	–	–	–
+22 0	+25 0	+25 0	+29 0	+32 0	+36 0	+40 0	+44 0	+50 0	+56 0	+66 0	+78 0
+35 0	+40 0	+40 0	+46 0	+52 0	+57 0	+63 0	+70 0	+80 0	+90 0	+105 0	+125 0
+54 0	+63 0	+63 0	+72 0	+81 0	+89 0	+97 0	+110 0	+125 0	+140 0	+165 0	+195 0
+16 −6	+18 −7	+18 −7	+22 −7	+25 −7	+29 −7	+33 −7	–	–	–	–	–
+22 −13	+26 −14	+26 −14	+30 −16	+36 −16	+39 −18	+43 −20	–	–	–	–	–
+5 −5	+6 −6	+6 −6	+7 −7	+8 −8	+9 −9	+10 −10	–	–	–	–	–
+7,5 −7,5	+9 −9	+9 −9	+10 −10	+11,5 −11,5	+12,5 −12,5	+13,5 −13,5	–	–	–	–	–
+11 −11	+12,5 −12,5	+12,5 −12,5	+14,5 −14,5	+16 −16	+18 −18	+20 −20	+22 −22	+25 −25	+28 −28	+33 −33	+39 −39
+17,5 −17,5	+20 −20	+20 −20	+23 −23	+26 −26	+28,5 −28,5	+31,5 −31,5	+35 −35	+40 −40	+45 −45	+52 −52	+62 −62

Shaft and housing fits

Housing fits
(continued)

	Nominal housing bore diameter in mm				
	over **6** incl. **10**	**10** **18**	**18** **30**	**30** **50**	**50** **80**
	Deviation of bearing outside diameter in µm (normal tolerance)				
Δ_{Dmp}	0 −8	0 −8	0 −9	0 −11	0 −13
	Housing deviation, fit interference or fit clearance in µm				
K4	+0,5 −3,5	+1 −4	0 −6	+1 −6	+1 −7
K5	+1 −5	+2 −6	+1 −8	+2 −9	+3 −10
K6	+2 −7	+2 −9	+2 −11	+3 −13	+4 −15
K7	+5 −10	+6 −12	+6 −15	+7 −18	+9 −21
M6	−3 −12	−4 −15	−4 −17	−4 −20	−5 −24
M7	0 −15	0 −18	0 −21	0 −25	0 −30
N6	−7 −16	−9 −20	−11 −24	−12 −28	−14 −33
N7	−4 −19	−5 −23	−7 −28	−8 −33	−9 −39
P6	−12 −21	−15 −26	−18 −31	−21 −37	−26 −45
P7	−9 −24	−11 −29	−14 −35	−17 −42	−21 −51
R6	−16 −25	−20 −31	−24 −37	−29 −45	−35 −54
S7	−20 −29	−25 −36	−31 −44	−38 −54	−47 −66

80 120	120 150	150 180	180 250	250 315	315 400	400 500	500 630	630 800	800 1 000	1 000 1 250	1 250 1 600
0 −15	0 −18	0 −25	0 −30	0 −35	0 −40	0 −45	0 −50	0 −75	0 −100	0 −125	0 −160
+1 −9	+1 −11	+1 −11	0 −14	0 −16	0 −17	0 −20	–	–	–	–	–
+2 −13	+3 −15	+3 −15	+2 −18	+3 −20	+3 −22	+2 −25	–	–	–	–	–
+4 −18	+4 −21	+4 −21	+5 −24	+5 −27	+7 −29	+8 −32	0 −44	0 −50	0 −56	0 −66	0 −78
+10 −25	+12 −28	+12 −28	+13 −33	+16 −36	+17 −40	+18 −45	0 −70	0 −80	0 −90	0 −105	0 −125
−6 −28	−8 −33	−8 −33	−8 −37	−9 −41	−10 −46	−10 −50	−26 −70	−30 −80	−34 −90	−40 −106	−48 −126
0 −35	0 −40	0 −40	0 −46	0 −52	0 −57	0 −63	−26 −96	−30 −110	−34 −124	−40 −145	−48 −173
−16 −38	−20 −45	−20 −45	−22 −51	−25 −57	−26 −62	−27 −67	−44 −88	−50 −100	−56 −112	−66 −132	−78 −156
−10 −45	−12 −52	−12 −52	−14 −60	−14 −66	−16 −73	−17 −80	−44 −114	−50 −130	−56 −146	−66 −171	−78 −203
−30 −52	−36 −61	−36 −61	−41 −70	−47 −79	−51 −87	−55 −95	−78 −122	−88 −138	−100 −156	−120 −186	−140 −218
−24 −59	−28 −68	−28 −68	−33 −79	−36 −88	−41 −98	−45 −108	−78 −148	−88 −168	−100 −190	−120 −225	−140 −265
−44 −66	−56 −81	−61 −86	−68 −97	−85 −117	−97 −133	−113 −153	−150 −194	−175 −225	−210 −266	−250 −316	−300 −378
−64 −86	−85 −110	−101 −126	−113 −142	−149 −181	−179 −215	−219 −259	–	–	–	–	–

Normal tolerances

Normal tolerances for FAG radial bearings (excluding FAG tapered roller bearings)

Normal tolerances for FAG radial bearings, excluding tapered roller bearings.

Inner ring tolerances

Bore		Bore deviation		Variation				Runout	Deviation of inner ring width				Variation
d		$t_{\Delta dmp}$		t_{Vdsp}			t_{Vdmp}	t_{Kia}	$t_{\Delta Bs}$				t_{VBs}
mm		µm		µm			µm	µm	µm				µm
		Deviation		Diameter series					Deviation				
				9	0, 1	2, 3, 4			normal		modified[1]		
over	incl.	upper	lower	max.	max.	max.	max.	max.	upper	lower	upper	lower	max.
0,6[2]	2,5	0	−8	10	8	6	6	10	0	−40	0	–	12
2,5	10	0	−8	10	8	6	6	10	0	−120	0	−250	15
10	18	0	−8	10	8	6	6	10	0	−120	0	−250	20
18	30	0	−10	13	10	8	8	13	0	−120	0	−250	20
30	50	0	−12	15	12	9	9	15	0	−120	0	−250	20
50	80	0	−15	19	19	11	11	20	0	−150	0	−380	25
80	120	0	−20	25	25	15	15	25	0	−200	0	−380	25
120	180	0	−25	31	31	19	19	30	0	−250	0	−500	30
180	250	0	−30	38	38	23	23	40	0	−300	0	−500	30
250	315	0	−35	44	44	26	26	50	0	−350	0	−500	35
315	400	0	−40	50	50	30	30	60	0	−400	0	−630	40
400	500	0	−45	56	56	34	34	65	0	−450	0	–	50
500	630	0	−50	63	63	38	38	70	0	−500	0	–	60
630	800	0	−75	–	–	–	–	80	0	−750	0	–	70
800	1 000	0	−100	–	–	–	–	90	0	−1 000	0	–	80
1 000	1 250	0	−125	–	–	–	–	100	0	−1 250	0	–	100
1 250	1 600	0	−160	–	–	–	–	120	0	−1 600	0	–	120
1 600	2 000	0	−200	–	–	–	–	140	0	−2 000	0	–	140

[1] Only for bearings manufactured specifically for use as matched pairs.

[2] This diameter is included in the group.

Outer ring tolerances[1)]

Outside diameter		Deviation of outside diameter		Variation					Runout
D		$t_{\Delta Dmp}$		t_{VDsp}				t_{VDmp}[2)]	t_{Kea}
mm		µm		µm				µm	µm
		Deviation		Open bearings Diameter series			Bearings with sealing shields or sealing washers		
				9	0, 1	2, 3, 4			
over	incl.	upper	lower	max.	max.	max.	max.	max.	max.
2,5[3)]	6	0	−8	10	8	6	10	6	15
6	18	0	−8	10	8	6	10	6	15
18	30	0	−9	12	9	7	12	7	15
30	50	0	−11	14	11	8	16	8	20
50	80	0	−13	16	13	10	20	10	25
80	120	0	−15	19	19	11	26	11	35
120	150	0	−18	23	23	14	30	14	40
150	180	0	−25	31	31	19	38	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

1) $\overline{\Delta_{Cs}}$, Δ_{C1s}, V_{Cs} and V_{C2s} are identical to Δ_{Bs} and V_{Bs} for the inner ring of the corresponding bearing (table Tolerance class Normal Inner ring, page 22).

2) Applies before assembly of the bearing and after removal of internal and/or external snap rings.

3) This diameter is included in the group.

Normal tolerances

Normal tolerances for FAG tapered roller bearings in metric sizes

The main dimensions conform to ISO 355 and DIN 720, the dimensional and running tolerances conform to ISO 492:2014. These values are only valid for bearings in metric sizes.

Width tolerance to tolerance class Normal

Single row tapered roller bearings 302, 303, 313, 322, 323, T2EE, T4CB, T4DB, T5ED and T7FC correspond to the tolerance class Normal.

Bearings 320, 329, 330, 331 and 332 for shaft diameters over 200 mm have width tolerances to the tolerance class Normal. Bearings for shaft diameters < 200 mm have width tolerances to the tolerance class 6X, see table, page 26.

Inner ring tolerances

Bore		Bore deviation		Variation		Runout
d		$t_{\Delta dmp}$		t_{Vdsp}	t_{Vdmp}	t_{Kia}
mm		µm		µm	µm	µm
over	incl.	max.	min.	max.	max.	max.
–	10	0	−12	12	9	15
10	18	0	−12	12	9	15
18	30	0	−12	12	9	18
30	50	0	−12	12	9	20
50	80	0	−15	15	11	25
80	120	0	−20	20	15	30
120	180	0	−25	25	19	35
180	250	0	−30	30	23	50
250	315	0	−35	35	26	60
315	400	0	−40	40	30	70
400	500	0	−45	45	34	80
500	630	0	−60	60	40	90
630	800	0	−75	75	45	100
800	1 000	0	−100	100	55	115
1 000	1 250	0	−125	125	65	130
1 250	1 600	0	−160	160	80	150
1 600	2 000	0	−200	200	100	170

Width tolerances

Bore		Deviation of inner ring width		Width deviation					
d		$t_{\Delta Bs}$		$t_{\Delta Ts}$		$t_{\Delta T1s}$		$t_{\Delta T2s}$	
mm		µm		µm		µm		µm	
over	incl.	max.	min.	max.	min.	max.	min.	max.	min.
–	10	0	−120	+200	0	+100	0	+100	0
10	18	0	−120	+200	0	+100	0	+100	0
18	30	0	−120	+200	0	+100	0	+100	0
30	50	0	−120	+200	0	+100	0	+100	0
50	80	0	−150	+200	0	+100	0	+100	0
80	120	0	−200	+200	−200	+100	−100	+100	−100
120	180	0	−250	+350	−250	+150	−150	+200	−100
180	250	0	−300	+350	−250	+150	−150	+200	−100
250	315	0	−350	+350	−250	+150	−150	+200	−100
315	400	0	−400	+400	−400	+200	−200	+200	−200
400	500	0	−450	+450	−450	+225	−225	+225	−225
500	630	0	−500	+500	−500	–	–	–	–
630	800	0	−750	+600	−600	–	–	–	–
800	1 000	0	−1 000	+750	−750	–	–	–	–
1 000	1 250	0	−1 250	+900	−900	–	–	–	–
1 250	1 600	0	−1 600	+1 050	−1 050	–	–	–	–
1 600	2 000	0	−2 000	+1 200	−1 200	–	–	–	–

Normal tolerances

Outer ring tolerances

Outside diameter		Deviation of outside diameter		Variation		Runout
D		$t_{\Delta Dmp}$		t_{VDsp}	t_{VDmp}	t_{Kea}
mm		µm		µm	µm	µm
over	incl.	max.	min.	max.	max.	max.
–	18	0	–12	12	9	18
18	30	0	–12	12	9	18
30	50	0	–14	14	11	20
50	80	0	–16	16	12	25
80	120	0	–18	18	14	35
120	150	0	–20	20	15	40
150	180	0	–25	25	19	45
180	250	0	–30	30	23	50
250	315	0	–35	35	26	60
315	400	0	–40	40	30	70
400	500	0	–45	45	34	80
500	630	0	–50	60	38	100
630	800	0	–75	80	55	120
800	1 000	0	–100	100	75	140
1 000	1 250	0	–125	130	90	160
1 250	1 600	0	–160	170	100	180
1 600	2 000	0	–200	210	110	200
2 000	2 500	0	–250	265	120	220

The width tolerance Δ_{Cs} is identical to Δ_{Bs} for the inner ring of the same bearing.

Width tolerance to tolerance class 6X

Tapered roller bearings 320, 329, 330, 331 and 332 for shaft diameters up to 200 mm and inch size bearings with the code KJ have restricted width tolerances to the tolerance class 6X.

Width tolerances

Bore		Deviation of inner ring width		Width deviation							
d		$t_{\Delta Bs}$		$t_{\Delta Cs}$		$t_{\Delta Ts}$		$t_{\Delta T1s}$		$t_{\Delta T2s}$	
mm		µm		µm		µm		µm		µm	
over	incl.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.
–	10	0	–50	0	–100	+100	0	+50	0	+50	0
10	18	0	–50	0	–100	+100	0	+50	0	+50	0
18	30	0	–50	0	–100	+100	0	+50	0	+50	0
30	50	0	–50	0	–100	+100	0	+50	0	+50	0
50	80	0	–50	0	–100	+100	0	+50	0	+50	0
80	120	0	–50	0	–100	+100	0	+50	0	+50	0
120	180	0	–50	0	–100	+150	0	+50	0	+100	0
180	250	0	–50	0	–100	+150	0	+50	0	+100	0
250	315	0	–50	0	–100	+200	0	+100	0	+100	0
315	400	0	–50	0	–100	+200	0	+100	0	+100	0
400	500	0	–50	0	–100	+200	0	+100	0	+100	0

Restricted tolerance class 5

Tapered roller bearings with restricted tolerances correspond to the tolerance class 5 to ISO 492:2014.

Inner ring tolerances

Bore		Bore deviation		Variation		Runout
d		$t_{\Delta dmp}$		t_{Vdsp}	t_{Vdmp}	t_{Kia}
mm		µm		µm	µm	µm
over	incl.	max.	min.	max.	max.	max.
–	10	0	−7	5	5	5
10	18	0	−7	5	5	5
18	30	0	−8	6	5	5
30	50	0	−10	8	5	6
50	80	0	−12	9	6	7
80	120	0	−15	11	8	8
120	180	0	−18	14	9	11
180	250	0	−22	17	11	13
250	315	0	−25	19	13	13
315	400	0	−30	23	15	15
400	500	0	−35	28	17	20
500	630	0	−40	35	20	25
630	800	0	−50	45	25	30
800	1 000	0	−60	60	30	37
1 000	1 250	0	−75	75	37	45
1 250	1 600	0	−90	90	45	55

Width tolerances

Bore		Deviation of inner ring width		Deviation of bearing width	
d		$t_{\Delta Bs}$		$t_{\Delta Ts}$	
mm		µm		µm	
over	incl.	max.	min.	max.	min.
–	10	0	−200	+200	−200
10	18	0	−200	+200	−200
18	30	0	−200	+200	−200
30	50	0	−240	+200	−200
50	80	0	−300	+200	−200
80	120	0	−400	+200	−200
120	180	0	−500	+350	−250
180	250	0	−600	+350	−250
250	315	0	−700	+350	−250
315	400	0	−800	+400	−400
400	500	0	−900	+450	−450
500	630	0	−1 100	+500	−500
630	800	0	−1 600	+600	−600
800	1 000	0	−2 000	+750	−750
1 000	1 250	0	−2 000	+750	−750
1 250	1 600	0	−2 000	+900	−900

Normal tolerances

Outer ring tolerances

Outside diameter		Deviation of outside diameter		Variation		Runout
D		$t_{\Delta Dmp}$		t_{VDsp}	t_{VDmp}	t_{Kea}
mm		µm		µm	µm	µm
over	incl.	max.	min.	max.	max.	max.
–	18	0	–8	6	5	6
18	30	0	–8	6	5	6
30	50	0	–9	7	5	7
50	80	0	–11	8	6	8
80	120	0	–13	10	7	10
120	150	0	–15	11	8	11
150	180	0	–18	14	9	13
180	250	0	–20	15	10	15
250	315	0	–25	19	13	18
315	400	0	–28	22	14	20
400	500	0	–33	26	17	24
400	500	0	–38	30	20	30
500	630	0	–45	38	25	36
630	800	0	–60	50	30	43
800	1 000	0	–80	65	38	52
1 000	1 250	0	–100	90	50	62
1 250	1 600	0	–125	120	65	73

Normal tolerances for FAG tapered roller bearings to ANSI/ABMA

Tapered roller bearings of series K are manufactured as standard with normal tolerances based on ANSI/ABMA.
Exception: series KJ = 6X.
The width Δ_{Bs} and radial runout correspond to the tolerance class Normal to ISO 492:2014.
The bore and outside diameters of bearings in inch sizes have plus tolerances.

Inner ring tolerances

Bore d mm		Bore deviation $t_{\Delta dmp}$ µm		Runout t_{Kia} µm
over	incl.	max.	min.	
10	18	13	0	15
18	30	13	0	18
30	50	13	0	20
50	81	13	0	25
81	120	25	0	30
120	180	25	0	35
180	305	25	0	50
305	400	50	0	50

Width tolerances

Bore d mm		Deviation of inner ring width (in relation to bore) $t_{\Delta Bs}$ µm		Deviation of bearing width $t_{\Delta Ts}$ µm	
over	incl.	max.	min.	max.	min.
10	50	0	–120	+200	0
50	81	0	–150	+200	0
81	102	0	–200	+200	0
102	120	0	–200	+350	–250
120	180	0	–250	+350	–250
180	250	0	–300	+350	–250
250	305	0	–350	+350	–250
305	315	0	–350	+375	–375
315	400	0	–400	+375	–375

Outer ring tolerances

Outside diameter D mm		Deviation of outside diameter $t_{\Delta Dmp}$ µm		Runout t_{Kea} µm
over	incl.	max.	min.	
18	30	+25	0	18
30	50	+25	0	20
50	81	+25	0	25
81	120	+25	0	35
120	150	+25	0	40
150	180	+25	0	45
180	250	+25	0	50
250	305	+25	0	50
305	400	+50	0	50

Normal tolerances

Normal tolerances for axial bearings

The normal tolerances for axial bearings correspond to ISO 199, DIN 620-3.

Bore diameter tolerances for shaft locating washers

Bore d mm		Bore deviation $t_{\Delta dmp}$ µm Tolerance class				Variation t_{Vdp} µm Tolerance class	
		Normal, 6 and 5 Deviation		4 Deviation		Normal, 6 and 5	4
over	incl.	upper	lower	upper	lower	max.	max.
–	18	0	–8	0	–7	6	5
18	30	0	–10	0	–8	8	6
30	50	0	–12	0	–10	9	8
50	80	0	–15	0	–12	11	9
80	120	0	–20	0	–15	15	11
120	180	0	–25	0	–18	19	14
180	250	0	–30	0	–22	23	17
250	315	0	–35	0	–25	26	19
315	400	0	–40	0	–30	30	23
400	500	0	–45	0	–35	34	26
500	630	0	–50	0	–40	38	30
630	800	0	–75	0	–50	56	–
800	1 000	0	–100	0	–	75	–
1 000	1 250	0	–125	0	–	95	–

Outside diameter tolerances for housing locating washers

Outside diameter D mm		Deviation of outside diameter $t_{\Delta Dmp}$ µm Tolerance class				Variation t_{VDp} µm Tolerance class	
		Normal, 6 and 5 Deviation		4 Deviation		Normal, 6 and 5	4
over	incl.	upper	lower	upper	lower	max.	max.
10	18	0	–11	0	–7	8	5
18	30	0	–13	0	–8	10	6
30	50	0	–16	0	–9	12	7
50	80	0	–19	0	–11	14	8
80	120	0	–22	0	–13	17	10
120	180	0	–25	0	–15	19	11
180	250	0	–30	0	–20	23	15
250	315	0	–35	0	–25	26	19
315	400	0	–40	0	–28	30	21
400	500	0	–45	0	–33	34	25
500	630	0	–50	0	–38	38	29
630	800	0	–75	0	–45	55	34
800	1 000	0	–100	–	–	75	–
1 000	1 250	0	–125	–	–	75	–
1 250	1 600	0	–160	–	–	120	–

Variation of washer thickness for shaft and housing locating washers

Bore		Variation				
d mm		t_{Si} µm				t_{Se} µm
		Tolerance class Normal	Tolerance class 6	Tolerance class 5	Tolerance class 4	Tolerance class Normal, 6, 5, 4
over	incl.	max.	max.	max.	max.	
–	18	10	5	3	2	Identical to t_{Si} for the shaft locating washer of the corresponding bearing
18	30	10	5	3	2	
30	50	10	6	3	2	
50	80	10	7	4	3	
80	120	15	8	4	3	
120	180	15	9	5	4	
180	250	20	10	5	4	
250	315	25	13	7	5	
315	400	30	15	7	5	
400	500	30	18	9	6	
500	630	35	21	11	7	
630	800	40	25	13	8	
800	1 000	45	30	15	8	
1 000	1 250	50	35	18	9	

Normal tolerances

Tolerances for nominal bearing height

Tolerances: see table. The corresponding dimension symbols are shown in *Figure 1*.

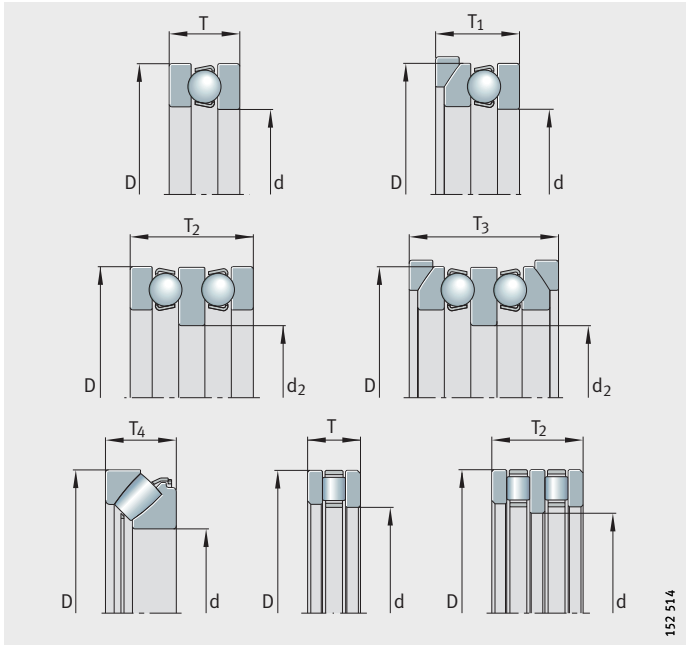


Figure 1
Tolerances
for nominal bearing height

Tolerances for nominal bearing height

Bore d mm		T Deviation µm		T_1 Deviation µm		T_2 Deviation µm		T_3 Deviation µm		T_4 Deviation µm	
over	incl.	upper	lower	upper	lower	upper	lower	upper	lower	upper	lower
–	30	20	–250	100	–250	150	–400	300	–400	20	–300
30	50	20	–250	100	–250	150	–400	300	–400	20	–300
50	80	20	–300	100	–300	150	–500	300	–500	20	–400
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

Chamfer dimensions

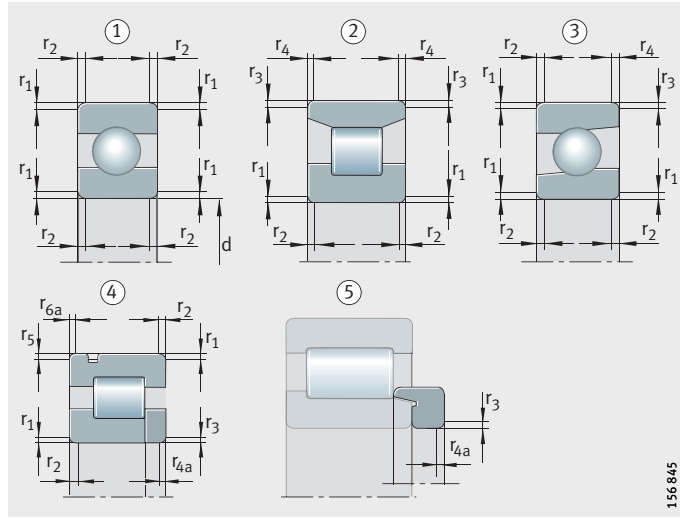
Chamfer dimensions for radial bearings (excluding tapered roller bearings)

The chamfer dimensions correspond to DIN 620-6.

The minimum and maximum values for the bearings are given in the table, page 34.

In the case of drawn cup needle roller bearings with open ends HK, drawn cup needle roller bearings with closed end BK and aligning needle roller bearings PNA and RPNA, the chamfer dimensions deviate from DIN 620-6.

Chamfer dimensions for tapered roller bearings: see table, page 35, for axial bearings see table, page 38.



① Symmetrical ring cross-section with identical chamfers on both rings
② Symmetrical ring cross-section with different chamfers on both rings
③ Asymmetrical ring cross-section
④ Annular slot on outer ring, bearing with rib washer
⑤ L-section ring

Figure 1
Chamfer dimensions for radial bearings excluding tapered roller bearings

Chamfer dimensions

Limit values for chamfer dimensions of radial bearings to DIN 620-6 (excluding tapered roller bearings)

Nominal chamfer dimension $r^{1)}$ mm	Nominal bearing bore diameter d mm		Chamfer dimension			
			r_1 to r_{6a} mm	r_1, r_3, r_5 mm	r_2, r_4, $r_6^{2)}$ mm	r_{4a}, r_{6a} mm
	over	incl.	min.	max.	max.	max.
0,05	–	–	0,05	0,1	0,2	0,1
0,08	–	–	0,08	0,16	0,3	0,16
0,1	–	–	0,1	0,2	0,4	0,2
0,15	–	–	0,15	0,3	0,6	0,3
0,2	–	–	0,2	0,5	0,8	0,5
0,3	–	40	0,3	0,6	1	0,8
	40	–	0,3	0,8	1	0,8
0,5	–	40	0,5	1	2	1,5
	40	–	0,5	1,3	2	1,5
0,6	–	40	0,6	1	2	1,5
	40	–	0,6	1,3	2	1,5
1	–	50	1	1,5	3	2,2
	50	–	1	1,9	3	2,2
1,1	–	120	1,1	2	3,5	2,7
	120	–	1,1	2,5	4	2,7
1,5	–	120	1,5	2,3	4	3,5
	120	–	1,5	3	5	3,5
2	–	80	2	3	4,5	4
	80	220	2	3,5	5	4
	220	–	2	3,8	6	4
2,1	–	280	2,1	4	6,5	4,5
	280	–	2,1	4,5	7	4,5
2,5	–	100	2,5	3,8	6	5
	100	280	2,5	4,5	6	5
	280	–	2,5	5	7	5
3	–	280	3	5	8	5,5
	280	–	3	5,5	8	5,5
4	–	–	4	6,5	9	6,5
5	–	–	5	8	10	8
6	–	–	6	10	13	10
7,5	–	–	7,5	12,5	17	12,5
9,5	–	–	9,5	15	19	15
12	–	–	12	18	24	18
15	–	–	15	21	30	21
19	–	–	19	25	38	25

1) The nominal chamfer dimension r is identical to the smallest permissible chamfer dimension r_{min}.

2) For bearings with a width of 2 mm or less, the values for r_1 apply.

Chamfer dimensions for tapered roller bearings

Minimum and maximum values for metric tapered roller bearings: *Figure 2* and table.

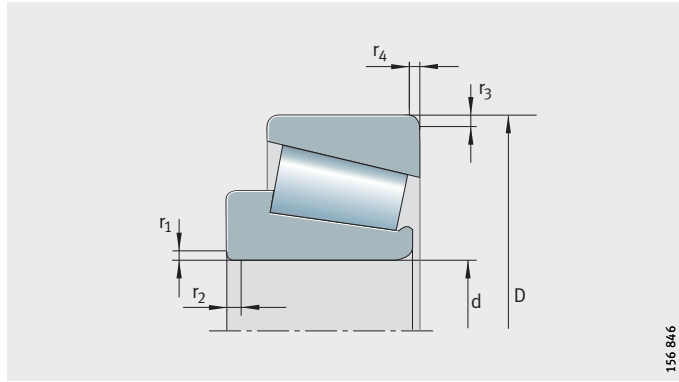


Figure 2
Chamfer dimensions for metric tapered roller bearings

Limit values for chamfer dimensions of tapered roller bearings

Nominal chamfer dimension $r^{1)}$ mm	Nominal dimension of bearing bore, outside diameter d, D mm		Chamfer dimension		
			r_1 to r_4 mm	r_1, r_3 mm	r_2, r_4 mm
	over	incl.	min.	max.	max.
0,3	–	40	0,3	0,7	1,4
	40	–	0,3	0,9	1,6
0,6	–	40	0,6	1,1	1,7
	40	–	0,6	1,3	2
1	–	50	1	1,6	2,5
	50	–	1	1,9	3
1,5	–	120	1,5	2,3	3
	120	250	1,5	2,8	3,5
	250	–	1,5	3,5	4
2	–	120	2	2,8	4
	120	250	2	3,5	4,5
	250	–	2	4	5
2,5	–	120	2,5	3,5	5
	120	250	2,5	4	5,5
	250	–	2,5	4,5	6
3	–	120	3	4	5,5
	120	250	3	4,5	6,5
	250	400	3	5	7
	400	–	3	5,5	7,5
4	–	120	4	5	7
	120	250	4	5,5	7,5
	250	400	4	6	8
	400	–	4	6,5	8,5
5	–	180	5	6,5	8
	180	–	5	7,5	9
6	–	180	6	7,5	10
	180	–	6	9	11

1) The nominal chamfer dimension r is identical to the smallest permissible chamfer dimension r_{min}.

Chamfer dimensions

Chamfer dimensions for tapered roller bearings in metric sizes

The limit values for chamfer dimensions r are only valid for tapered roller bearings in metric sizes to ISO 582:1995.

Limit values for chamfer dimensions

Nominal chamfer dimension $r^{1)}$ mm	Nominal dimension of bearing bore, outside diameter d, D mm		Chamfer dimension		
			r_1 to r_4 mm	r_1, r_3 mm	r_2, r_4 mm
	over	incl.	min.	max.	max.
0,3	–	40	0,3	0,7	1,4
	40	–	0,3	0,9	1,6
0,6	–	40	0,6	1,1	1,7
	40	–	0,6	1,3	2
1	–	50	1	1,6	2,5
	50	–	1	1,9	3
1,5	–	120	1,5	2,3	3
	120	250	1,5	2,8	3,5
	250	–	1,5	3,5	4
2	–	120	2	2,8	4
	120	250	2	3,5	4,5
	250	–	2	4	5
2,5	–	120	2,5	3,5	5
	120	250	2,5	4	5,5
	250	–	2,5	4,5	6
3	–	120	3	4	5,5
	120	250	3	4,5	6,5
	250	400	3	5	7
	400	–	3	5,5	7,5
4	–	120	4	5	7
	120	250	4	5,5	7,5
	250	400	4	6	8
	400	–	4	6,5	8,5
5	–	180	5	6,5	8
	180	–	5	7,5	9
6	–	180	6	7,5	10
	180	–	6	9	11

1) The nominal chamfer dimension r is identical to the smallest permissible chamfer dimension r_{min}.

Chamfer dimensions for FAG tapered roller bearings to ANSI/ABMA

The limit values for chamfer dimensions r are only valid for tapered roller bearings based on ANSI/ABMA.

Limit values for chamfer dimensions r_{max} for the inner ring

Nominal bearing bore diameter d mm		Chamfer dimension	
		r_1 mm	r_2 mm
over	incl.		
–	50,8	+0,4	+0,9
50,8	101,6	+0,5	+1,25
101,6	254	+0,65	+1,8

Limit values for chamfer dimensions r_{max} for the outer ring

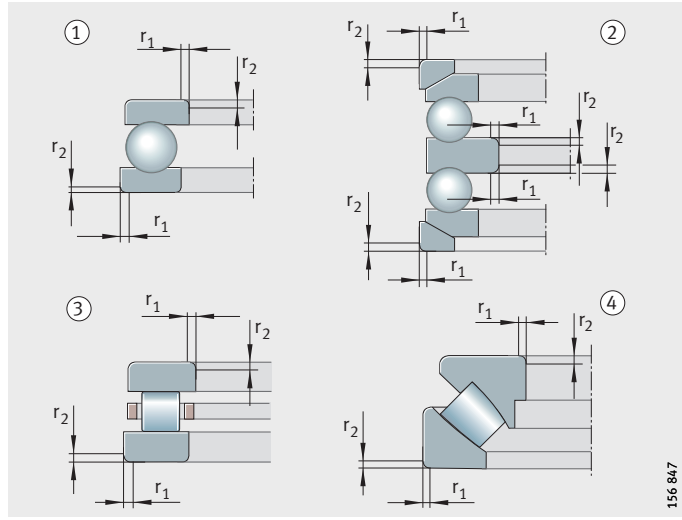
Nominal outside diameter D mm		Chamfer dimension	
		r_3 mm	r_4 mm
over	incl.		
–	101,6	+0,6	+1,05
101,6	168,3	+0,65	+1,15
168,3	266,7	+0,85	+1,35
266,7	355,6	+1,7	+1,7

Chamfer dimensions

Chamfer dimensions for axial bearings

Minumum and maximum values for metric tapered roller bearings: *Figure 3* and table. The table corresponds to DIN 620-6.

In the case of axial deep groove ball bearings, the tolerances for the chamfer dimensions are identical in both axial and radial directions.



① Single direction axial deep groove ball bearing with flat housing locating washer
② Double direction axial deep groove ball bearing with spherical housing locating washers and seating washers
③ Single direction axial cylindrical roller bearing
④ Single direction axial spherical roller bearing

Figure 3
Chamfer dimensions for axial bearings

Limit values for chamfer dimensions of axial bearings

Chamfer dimension		
$r^{1)}$ mm	r_1, r_2 mm	
	min.	max.
0,05	0,05	0,1
0,08	0,08	0,16
0,1	0,1	0,2
0,15	0,15	0,3
0,2	0,2	0,5
0,3	0,3	0,8
0,6	0,6	1,5
1	1	2,2
1,1	1,1	2,7
1,5	1,5	3,5
2	2	4
2,1	2,1	4,5
3	3	5,5
4	4	6,5
5	5	8
6	6	10
7,5	7,5	12,5
9,5	9,5	15
12	12	18
15	15	21
19	19	25

1) The nominal chamfer dimension r is identical to the smallest permissible chamfer dimension r_{min}.

Radial internal clearance

Radial internal clearance of FAG deep groove ball bearings

The radial internal clearance corresponds to the internal clearance group Group N to ISO 5753-1, DIN 620-4.

Standardised bearings with increased internal clearance have the suffix C3. Special bearings with the radial internal clearance Group 3 or Group 4 are indicated in the dimension tables.

Radial internal clearance of FAG deep groove ball bearings with cylindrical bore

Bore d mm		Radial internal clearance							
		Group 2 µm		Group N µm		Group 3 µm		Group 4 µm	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.
1,5	6	0	7	2	13	8	23	–	–
6	10	0	7	2	13	8	23	14	29
10	18	0	9	3	18	11	25	18	33
18	24	0	10	5	20	13	28	20	36
24	30	1	11	5	20	13	28	23	41
30	40	1	11	6	20	15	33	28	46
40	50	1	11	6	23	18	36	30	51
50	65	1	15	8	28	23	43	38	61
65	80	1	15	10	30	25	51	46	71
80	100	1	18	12	36	30	58	53	84
100	120	2	20	15	41	36	66	61	97
120	140	2	23	18	48	41	81	71	114
140	160	2	23	18	53	46	91	81	130
160	180	2	25	20	61	53	102	91	147
180	200	2	30	25	71	63	117	107	163
200	225	2	35	25	85	75	140	125	195
225	250	2	40	30	95	85	160	145	225
250	280	2	45	35	105	90	170	155	245
280	315	2	55	40	115	100	190	175	270
315	355	3	60	45	125	110	210	195	300
355	400	3	70	55	145	130	240	225	340
400	450	3	80	60	170	150	270	250	380
450	500	3	90	70	190	170	300	280	420
500	560	10	100	80	210	190	330	310	470
560	630	10	110	90	230	210	360	340	520
630	710	20	130	110	260	240	400	380	570
710	800	20	140	120	290	270	450	430	630
800	900	20	160	140	320	300	500	480	700
900	1 000	20	170	150	350	330	550	530	770
1 000	1 120	20	180	160	380	360	600	580	850
1 120	1 250	20	190	170	410	390	650	630	920
1 250	1 400	30	200	190	440	420	700	680	990
1 400	1 600	30	210	210	470	450	750	730	1 060

Radial internal clearance

Radial internal clearance of FAG self-aligning ball bearings

The radial internal clearance is Group N to ISO 5753-1, DIN 620-4.

Radial internal clearance of FAG self-aligning ball bearings with cylindrical bore

Bore d mm		Radial internal clearance			
		Group N µm		Group 3 µm	
over	incl.	min.	max.	min.	max.
–	6	5	15	10	20
6	10	6	17	12	25
10	14	6	19	13	26
14	18	8	21	15	28
18	24	10	23	17	30
24	30	11	24	19	35
30	40	13	29	23	40
40	50	14	31	25	44
50	65	16	36	30	50
65	80	18	40	35	60
80	100	22	48	42	70
100	120	25	56	50	83
120	140	30	68	60	100
140	160	35	80	70	120

Bearings with a tapered bore have the internal clearance group Group 3 to ISO 5753-1, DIN 620-4.

Radial internal clearance of FAG self-aligning ball bearings with tapered bore

Bore d mm		Radial internal clearance			
		Group N µm		Group 3 µm	
over	incl.	min.	max.	min.	max.
18	24	13	26	20	33
24	30	15	28	23	39
30	40	19	35	29	46
40	50	22	39	33	52
50	65	27	47	41	61
65	80	35	57	50	75
80	100	42	68	62	90
100	120	50	81	75	108
120	140	60	98	90	130
140	160	65	110	100	150

Radial internal clearance of FAG barrel roller bearings

The radial internal clearance corresponds to the internal clearance group Group N to ISO 5753-1, DIN 620-4.

Bearings with a tapered bore have the internal clearance group Group 3 to ISO 5753-1, DIN 620-4.

Radial internal clearance of FAG barrel roller bearings with cylindrical bore

Bore d mm		Radial internal clearance							
		Group 2 µm		Group N µm		Group 3 µm		Group 4 µm	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.
–	30	2	9	9	17	17	28	28	40
30	40	3	10	10	20	20	30	30	45
40	50	3	13	13	23	23	35	35	50
50	65	4	15	15	27	27	40	40	55
65	80	5	20	20	35	35	55	55	75
80	100	7	25	25	45	45	65	65	90
100	120	10	30	30	50	50	70	70	95
120	140	15	35	35	55	55	80	80	110
140	160	20	40	40	65	65	95	95	125
160	180	25	45	45	70	70	100	100	130
180	225	30	50	50	75	75	105	105	135
225	250	35	55	55	80	80	110	110	140
250	280	40	60	60	85	85	115	115	145
280	315	40	70	70	100	100	135	135	170
315	355	45	75	75	105	105	140	140	175

Radial internal clearance of FAG barrel roller bearings with tapered bore

Bore d mm		Radial internal clearance							
		Group 2 µm		Group N µm		Group 3 µm		Group 4 µm	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.
–	30	9	17	17	28	28	40	40	55
30	40	10	20	20	30	30	45	45	60
40	50	13	23	23	35	35	50	50	65
50	65	15	27	27	40	40	55	55	75
65	80	20	35	35	55	55	75	75	95
80	100	25	45	45	65	65	90	90	120
100	120	30	50	50	70	70	95	95	125
120	140	35	55	55	80	80	110	110	140
140	160	40	65	65	95	95	125	125	155
160	180	45	70	70	100	100	130	130	160
180	225	50	75	75	105	105	135	135	165
225	250	55	80	80	110	110	140	140	170
250	280	60	85	85	115	115	145	145	175
280	315	70	100	100	135	135	170	170	205
315	355	75	105	105	140	140	175	175	210

Radial internal clearance

Radial internal clearance of FAG cylindrical roller bearings

The radial internal clearance of bearings with a cylindrical bore normally corresponds to the internal clearance group Group N to ISO 5753-1, DIN 620-4.

Radial internal clearance of FAG cylindrical roller bearings with cylindrical bore

Bore d mm		Radial internal clearance C1NA µm	
over	incl.	min.	max.
–	24	10	20
24	30	15	25
30	40	15	25
40	50	17	30
50	65	20	35
65	80	25	40
80	100	35	55
100	120	40	60
120	140	45	70
140	160	50	75
160	180	55	85
180	200	60	90
200	225	60	95
225	250	65	100
250	280	75	110
280	315	80	120
315	355	90	135
355	400	100	150
400	450	110	170
450	500	120	190
500	560	130	210
560	630	140	230
630	710	160	260
710	800	170	290
800	900	190	330
900	1 000	210	360
1 000	1 120	230	400
1 120	1 250	250	440
1 250	1 400	270	460
1 400	1 600	300	500
1 600	1 800	320	530
1 800	2 000	340	560

Group 2		Group N		Group 3		Group 4	
µm		µm		µm		µm	
min.	max.	min.	max.	min.	max.	min.	max.
15	40	20	45	35	60	50	75
20	45	20	45	35	60	50	75
20	45	25	50	45	70	60	85
25	55	30	60	50	80	70	100
30	60	40	70	60	90	80	110
35	70	40	75	65	100	90	125
40	75	50	85	75	110	105	140
50	90	50	90	85	125	125	165
55	100	60	105	100	145	145	190
60	110	70	120	115	165	165	215
75	125	75	125	120	170	170	220
85	140	90	145	140	195	195	250
95	155	105	165	160	220	220	280
105	170	110	175	170	235	235	300
115	185	125	195	190	260	260	330
130	205	130	205	200	275	275	350
145	225	145	225	225	305	305	385
165	255	190	280	280	370	370	460
185	285	210	310	310	410	410	510
205	315	220	330	330	440	440	550
230	350	240	360	360	480	480	600
260	380	260	380	380	500	500	620
295	435	285	425	425	565	565	705
325	485	310	470	470	630	630	790
370	540	350	520	520	690	690	860
410	600	390	580	580	770	770	960
455	665	430	640	640	850	850	1 060
490	730	470	710	710	950	950	1 190
550	810	530	790	790	1 050	1 050	1 310
640	920	610	890	890	1 170	1 170	1 450
700	1 020	700	1 020	1 020	1 340	1 340	1 660
760	1 120	760	1 120	1 120	1 480	1 480	1 840

Radial internal clearance

Radial internal clearance of FAG cylindrical roller bearings with tapered bore

Bore d mm		Radial internal clearance C1NA μm	
over	incl.	min.	max.
–	24	5	15
24	30	5	15
30	40	5	15
40	50	5	18
50	65	5	20
65	80	10	25
80	100	10	30
100	120	10	30
120	140	10	35
140	160	10	35
160	180	10	40
180	200	15	45
200	225	15	50
225	250	15	50
250	280	20	55
280	315	20	60
315	355	20	65
355	400	25	75
400	450	25	85
450	500	25	95
500	560	25	100
560	630	30	110
630	710	30	130
710	800	35	140
800	900	35	160
900	1 000	35	180
1 000	1 120	50	200
1 120	1 250	60	220
1 250	1 400	60	240
1 400	1 600	70	270
1 600	1 800	80	300
1 800	2 000	100	320

Bearings with a tapered bore frequently have a radial internal clearance Group 3 or Group 4 to DIN 620-4 (ISO 5753-1).

Group 2 µm		Group N µm		Group 3 µm		Group 4 µm	
min.	max.	min.	max.	min.	max.	min.	max.
0	25	30	55	40	65	50	75
0	25	35	60	45	70	55	80
5	30	40	65	55	80	70	95
5	35	45	75	60	90	75	105
10	40	50	80	70	100	90	120
10	45	60	95	85	120	110	145
15	50	70	105	95	130	120	155
15	55	90	130	115	155	140	180
15	60	100	145	130	175	160	205
20	70	110	160	145	195	180	230
25	75	125	175	160	210	195	245
35	90	140	195	180	235	220	275
45	105	155	215	200	260	245	305
45	110	170	235	220	285	270	335
55	125	185	255	240	310	295	365
55	130	205	280	265	340	325	400
65	145	225	305	290	370	355	435
100	190	255	345	330	420	405	495
110	210	285	385	370	470	455	555
110	220	315	425	410	520	505	615
120	240	350	470	455	575	560	680
140	260	380	500	500	620	620	740
145	285	435	575	565	705	695	835
150	310	485	645	630	790	775	935
180	350	540	710	700	870	860	1 030
200	390	600	790	780	970	960	1 150
220	430	665	875	865	1 075	1 065	1 275
230	470	730	970	960	1 200	1 200	1 440
270	530	810	1 070	1 070	1 330	1 330	1 590
330	610	920	1 200	1 200	1 480	1 480	1 760
380	700	1 020	1 340	1 340	1 660	1 660	1 980
400	760	1 120	1 480	1 480	1 840	1 840	2 200

Radial internal clearance

Radial internal clearance of FAG toroidal roller bearings

The radial internal clearance of toroidal roller bearings corresponds to the internal clearance groups in accordance with ISO 5753-1.

Radial internal clearance of FAG toroidal roller bearings with cylindrical bore

Bore d mm		Radial internal clearance Group 2 µm	
over	incl.	min.	max.
18	24	15	30
24	30	15	35
30	40	20	40
40	50	25	45
50	65	30	55
65	80	40	70
80	100	50	85
100	120	60	100
120	140	75	120
140	160	85	140
160	180	95	155
180	200	105	175
200	225	115	190
225	250	125	205
250	280	135	225
280	315	150	240
315	355	160	260
355	400	175	280
400	450	190	310
450	500	205	335
500	560	220	360
560	630	240	400
630	710	260	440
710	800	300	500
800	900	320	540
900	1 000	370	600
1 000	1 120	410	660
1 120	1 250	450	720
1 250	1 400	490	800
1 400	1 600	570	890
1 600	1 800	650	1 010

Group N		Group 3		Group 4		Group 5	
µm		µm		µm		µm	
min.	max.	min.	max.	min.	max.	min.	max.
25	40	35	55	50	65	65	85
30	50	45	60	60	80	75	95
35	55	55	75	70	95	90	120
45	65	65	85	85	110	105	140
50	80	75	105	100	140	135	175
65	100	95	125	120	165	160	210
80	120	120	160	155	210	205	260
100	145	140	190	185	245	240	310
115	170	165	215	215	280	280	350
135	195	195	250	250	325	320	400
150	220	215	280	280	365	360	450
170	240	235	310	305	395	390	495
185	265	260	340	335	435	430	545
200	285	280	370	365	480	475	605
220	310	305	410	405	520	515	655
235	330	330	435	430	570	570	715
255	360	360	485	480	620	620	790
280	395	395	530	525	675	675	850
305	435	435	580	575	745	745	930
335	475	475	635	630	815	810	1 015
360	520	510	690	680	890	890	1 110
390	570	560	760	750	980	970	1 220
430	620	610	840	830	1 080	1 070	1 340
490	680	680	920	920	1 200	1 200	1 480
530	760	750	1 020	1 010	1 330	1 320	1 660
590	830	830	1 120	1 120	1 460	1 460	1 830
660	930	930	1 260	1 260	1 640	1 640	2 040
720	1 020	1 020	1 380	1 380	1 800	1 800	2 240
800	1 130	1 130	1 510	1 540	1 970	1 970	2 460
890	1 250	1 250	1 680	1 680	2 200	2 200	2 740
1 010	1 390	1 390	1 870	1 870	2 430	2 430	3 000

Radial internal clearance

Radial internal clearance of FAG toroidal roller bearings with tapered bore

Bore d mm		Radial internal clearance Group 2 μm	
over	incl.	min.	max.
18	24	15	35
24	30	20	40
30	40	25	50
40	50	30	55
50	65	40	65
65	80	50	80
80	100	60	100
100	120	75	115
120	140	90	135
140	160	100	155
160	180	115	175
180	200	130	195
200	225	140	215
225	250	160	235
250	280	170	260
280	315	195	285
315	355	220	320
355	400	250	350
400	450	280	385
450	500	305	435
500	560	330	480
560	630	380	530
630	710	420	590
710	800	480	680
800	900	520	740
900	1 000	580	820
1 000	1 120	640	900
1 120	1 250	700	980
1 250	1 400	770	1 080
1 400	1 600	870	1 200
1 600	1 800	950	1 320

Group N		Group 3		Group 4		Group 5	
µm		µm		µm		µm	
min.	max.	min.	max.	min.	max.	min.	max.
30	45	40	55	55	70	65	85
35	55	50	65	65	85	80	100
45	65	60	80	80	100	100	125
50	75	70	95	90	120	115	145
60	90	85	115	110	150	145	185
75	110	105	140	135	180	175	220
95	135	130	175	170	220	215	275
115	155	155	205	200	255	255	325
135	180	180	235	230	295	290	365
155	215	210	270	265	340	335	415
170	240	235	305	300	385	380	470
190	260	260	330	325	420	415	520
210	290	285	365	360	460	460	575
235	315	315	405	400	515	510	635
255	345	340	445	440	560	555	695
280	380	375	485	480	620	615	765
315	420	415	545	540	680	675	850
350	475	470	600	595	755	755	920
380	525	525	655	650	835	835	1 005
435	575	575	735	730	915	910	1 115
470	640	630	810	800	1 010	1 000	1 230
530	710	700	890	880	1 110	1 110	1 350
590	780	770	990	980	1 230	1 230	1 490
670	860	860	1 100	1 100	1 380	1 380	1 660
730	960	950	1 220	1 210	1 530	1 520	1 860
810	1 040	1 040	1 340	1 340	1 670	1 670	2 050
890	1 170	1 160	1 500	1 490	1 880	1 870	2 280
970	1 280	1 270	1 640	1 630	2 060	2 050	2 500
1 080	1 410	1 410	1 790	1 780	2 250	2 250	2 740
1 200	1 550	1 550	1 990	1 990	2 500	2 500	3 050
1 320	1 690	1 690	2 180	2 180	2 730	2 730	3 310

Axial internal clearance

Axial internal clearance of double row FAG angular contact ball bearings

The main dimensions of the bearings conform to DIN 628-3.

The dimensional and running tolerances of the bearings correspond to tolerance class 6 to DIN 620-2, ISO 492:2014.

Double row angular contact ball bearings of the basic design have the normal axial internal clearance (CN). Bearings are available by agreement with an axial internal clearance larger (C3) or smaller (C2) than normal.

Bearings with a split inner ring are intended for higher axial loads. In general, they have a tighter fit than unsplit bearings. Their normal internal clearance corresponds approximately to the internal clearance group C3 for unsplit bearings.

Axial internal clearance to DIN 628-3 of FAG angular contact ball bearings with unsplit inner ring

Bore d mm		Axial internal clearance							
		C2 µm		CN µm		C3 µm		C4 µm	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.
–	10	1	11	5	21	12	28	25	45
10	18	1	12	6	23	13	31	27	47
18	24	2	14	7	25	16	34	28	48
24	30	2	15	8	27	18	37	30	50
30	40	2	16	9	29	21	40	33	54
40	50	2	18	11	33	23	44	36	58
50	65	3	22	13	36	26	48	40	63
65	80	3	24	15	40	30	54	46	71
80	100	3	26	18	46	35	63	55	83
100	120	4	30	22	53	42	73	65	96
120	140	4	34	25	59	48	82	74	108

Axial internal clearance of FAG angular contact ball bearings with split inner ring

Bore d mm		Axial internal clearance					
		C2 µm		CN µm		C3 µm	
over	incl.	min.	max.	min.	max.	min.	max.
24	30	8	27	16	35	27	46
30	40	9	29	18	38	30	50
40	50	11	33	22	44	36	58
50	65	13	36	25	48	40	63
65	80	15	40	29	54	46	71

Axial internal clearance of FAG four point contact bearings

The axial internal clearance corresponds to the internal clearance group CN to DIN 628-4.

Axial internal clearance of FAG four point contact bearings

Bore d mm		Axial internal clearance							
		C2 µm		CN µm		C3 µm		C4 µm	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.
18	40	30	70	60	110	100	150	140	190
40	60	40	90	80	130	120	170	160	210
60	80	50	100	90	140	130	180	170	220
80	100	60	120	100	160	140	200	180	240
100	140	70	140	120	180	160	220	200	260
140	180	80	160	140	200	180	240	220	280
180	220	100	180	160	220	200	260	240	300
220	260	120	200	180	240	220	300	280	360
260	300	140	220	200	280	260	340	320	400
300	355	160	240	220	300	280	360	–	–
355	400	180	270	250	330	310	390	–	–
400	450	200	290	270	360	340	430	–	–
450	500	220	310	290	390	370	470	–	–
500	560	240	330	310	420	400	510	–	–
560	630	260	360	340	450	430	550	–	–
630	710	280	390	370	490	470	590	–	–
710	800	300	420	400	540	520	660	–	–
800	900	330	460	440	590	570	730	–	–
900	1 000	360	500	480	630	620	780	–	–

Reduction in radial internal clearance of FAG cylindrical roller bearings with tapered bore

Nominal bearing bore diameter d mm		Radial internal clearance before mounting Internal clearance group					
		Group N mm		Group 3 mm		Group 4 mm	
over	incl.	min.	max.	min.	max.	min.	max.
24	30	0,035	0,06	0,045	0,07	0,055	0,08
30	40	0,04	0,065	0,055	0,08	0,07	0,095
40	50	0,045	0,075	0,06	0,09	0,075	0,105
50	65	0,05	0,08	0,07	0,1	0,09	0,12
65	80	0,06	0,095	0,085	0,12	0,11	0,145
80	100	0,07	0,105	0,095	0,13	0,12	0,155
100	120	0,09	0,13	0,115	0,155	0,14	0,18
120	140	0,1	0,145	0,13	0,175	0,16	0,205
140	160	0,11	0,16	0,145	0,195	0,18	0,23
160	180	0,125	0,175	0,16	0,21	0,195	0,245
180	200	0,14	0,195	0,18	0,235	0,22	0,275
200	225	0,155	0,215	0,2	0,26	0,245	0,305
225	250	0,17	0,235	0,22	0,285	0,27	0,335
250	280	0,185	0,255	0,24	0,31	0,295	0,365
280	315	0,205	0,28	0,265	0,34	0,325	0,4
315	355	0,225	0,305	0,29	0,37	0,355	0,435
355	400	0,255	0,345	0,33	0,42	0,405	0,495
400	450	0,285	0,385	0,37	0,47	0,455	0,555
450	500	0,315	0,425	0,41	0,52	0,505	0,615
500	560	0,35	0,47	0,455	0,575	0,56	0,68
560	630	0,38	0,5	0,5	0,62	0,62	0,74
630	710	0,435	0,575	0,565	0,705	0,695	0,835
710	800	0,485	0,645	0,63	0,79	0,775	0,935
800	900	0,54	0,71	0,7	0,87	0,86	1,03
900	1 000	0,6	0,79	0,78	0,97	0,96	1,15
1 000	1 120	0,665	0,875	0,865	1,075	1,065	1,275
1 120	1 250	0,73	0,97	0,96	1,2	1,2	1,44
1 250	1 400	0,81	1,07	1,07	1,33	1,33	1,59

1) Valid only for solid steel shafts and hollow shafts with a bore no larger than half the shaft diameter.
The following applies: Bearings with a radial internal clearance before mounting in the upper half of the tolerance range are mounted using the larger value for the reduction in radial internal clearance or the axial drive-up distance, while bearings in the lower half of the tolerance range are mounted using the smaller value for the reduction in radial internal clearance or the axial drive-up distance.

2) The actual value of the radial internal clearance must not be smaller than the control value. In the case of bearings with a small diameter, this may be difficult to determine.

Reduction in radial internal clearance[1]		Drive-up distance on taper 1:12[1]				Control value for radial internal clearance after mounting[2]		
		Shaft		Sleeve		Group N	Group 3	Group 4
mm		mm		mm		mm	mm	mm
min.	max.	min.	max.	min.	max.	min.	min.	min.
0,015	0,02	0,3	0,35	0,3	0,4	0,02	0,025	0,035
0,02	0,025	0,35	0,4	0,35	0,45	0,02	0,025	0,04
0,025	0,03	0,4	0,45	0,45	0,5	0,02	0,03	0,045
0,03	0,035	0,45	0,55	0,5	0,65	0,02	0,035	0,05
0,035	0,04	0,55	0,6	0,65	0,7	0,025	0,04	0,07
0,04	0,045	0,6	0,7	0,65	0,8	0,03	0,05	0,075
0,045	0,055	0,7	0,85	0,8	0,95	0,045	0,065	0,085
0,055	0,065	0,85	1	0,95	1,1	0,045	0,07	0,095
0,06	0,075	0,9	1,2	1,1	1,3	0,05	0,075	0,105
0,065	0,085	1	1,3	1,3	1,5	0,06	0,08	0,11
0,075	0,095	1,2	1,5	1,4	1,7	0,065	0,09	0,125
0,085	0,105	1,3	1,6	1,6	1,8	0,07	0,1	0,14
0,095	0,115	1,5	1,8	1,7	2	0,075	0,105	0,155
0,105	0,125	1,6	2	1,9	2,3	0,08	0,125	0,17
0,115	0,14	1,8	2,2	2,2	2,4	0,09	0,13	0,185
0,13	0,16	2	2,5	2,5	2,7	0,095	0,14	0,195
0,14	0,17	2,2	2,6	2,6	2,9	0,115	0,165	0,235
0,15	0,185	2,3	2,8	2,8	3,1	0,135	0,19	0,27
0,16	0,195	2,5	3	3,1	3,4	0,155	0,215	0,31
0,17	0,215	2,7	3,4	3,5	3,8	0,18	0,24	0,345
0,185	0,24	2,9	3,7	3,6	4,2	0,195	0,26	0,38
0,2	0,26	3,1	4,1	3,9	4,7	0,235	0,305	0,435
0,22	0,28	3,4	4,4	4,3	5,3	0,26	0,35	0,495
0,24	0,31	3,7	4,8	4,8	5,5	0,3	0,39	0,55
0,26	0,34	4,1	5,3	5,2	6,2	0,34	0,44	0,62
0,28	0,37	4,4	5,8	5,7	7	0,385	0,5	0,7
0,31	0,41	4,8	6,4	6,3	7,6	0,42	0,55	0,79
0,34	0,45	5,3	7	0,3	8,3	0,47	0,62	0,85

Reduction in radial internal clearance

Reduction in radial internal clearance of FAG spherical roller bearings with tapered bore

Nominal bearing bore diameter d mm		Radial internal clearance before mounting Internal clearance group					
		Group N mm		Group 3 mm		Group 4 mm	
over	incl.	min.	max.	min.	max.	min.	max.
24	30	0,03	0,04	0,04	0,055	0,055	0,075
30	40	0,035	0,05	0,05	0,065	0,065	0,085
40	50	0,045	0,06	0,06	0,08	0,08	0,1
50	65	0,055	0,075	0,075	0,095	0,095	0,12
65	80	0,07	0,095	0,095	0,12	0,12	0,15
80	100	0,08	0,11	0,11	0,14	0,14	0,18
100	120	0,1	0,135	0,135	0,17	0,17	0,22
120	140	0,12	0,16	0,16	0,2	0,2	0,26
140	160	0,13	0,18	0,18	0,23	0,23	0,3
160	180	0,14	0,2	0,2	0,26	0,26	0,34
180	200	0,16	0,22	0,22	0,29	0,29	0,37
200	225	0,18	0,25	0,25	0,32	0,32	0,41
225	250	0,2	0,27	0,27	0,35	0,35	0,45
250	280	0,22	0,3	0,3	0,39	0,39	0,49
280	315	0,24	0,33	0,33	0,43	0,43	0,54
315	355	0,27	0,36	0,36	0,47	0,47	0,59
355	400	0,3	0,4	0,4	0,52	0,52	0,65
400	450	0,33	0,44	0,44	0,57	0,57	0,72
450	500	0,37	0,49	0,49	0,63	0,63	0,79
500	560	0,41	0,54	0,54	0,68	0,68	0,87
560	630	0,46	0,6	0,6	0,76	0,76	0,98
630	710	0,51	0,67	0,67	0,85	0,85	1,09
710	800	0,57	0,75	0,75	0,96	0,96	1,22
800	900	0,64	0,84	0,84	1,07	1,07	1,37
900	1 000	0,71	0,93	0,93	1,19	1,19	1,52
1 000	1 120	0,78	1,02	1,02	1,3	1,3	1,65
1 120	1 250	0,86	1,12	1,12	1,42	1,42	1,8
1 250	1 400	0,94	1,22	1,22	1,55	1,55	1,96

[1] Valid only for solid steel shafts and hollow shafts with a bore no larger than half the shaft diameter.
The following applies: Bearings with a radial internal clearance before mounting in the upper half of the tolerance range are mounted using the larger value for the reduction in radial internal clearance or the axial drive-up distance, while bearings in the lower half of the tolerance range are mounted using the smaller value for the reduction in radial internal clearance or the axial drive-up distance.

[2] The actual value of the radial internal clearance must not be smaller than the control value. In the case of bearings with a small diameter, this may be difficult to determine.

Reduction in radial internal clearance[1]		Drive-up distance on taper 1:12[1]				Drive-up distance on taper 1:30[1]				Control value for radial internal clearance after mounting[2]		
		Shaft		Sleeve		Shaft		Sleeve		Group N	Group 3	Group 4
mm		mm		mm		mm		mm		mm	mm	mm
min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	min.	min.
0,015	0,02	0,3	0,35	0,3	0,4	–	–	–	–	0,015	0,02	0,035
0,02	0,025	0,35	0,4	0,35	0,45	–	–	–	–	0,015	0,025	0,04
0,025	0,03	0,4	0,45	0,45	0,5	–	–	–	–	0,02	0,03	0,05
0,03	0,04	0,45	0,6	0,5	0,7	–	–	–	–	0,025	0,035	0,055
0,04	0,05	0,6	0,75	0,7	0,85	–	–	–	–	0,025	0,04	0,07
0,045	0,06	0,7	0,9	0,75	1	1,7	2,2	1,8	2,4	0,035	0,05	0,08
0,05	0,07	0,7	1,1	0,8	1,2	1,9	2,7	2	2,8	0,05	0,065	0,1
0,065	0,09	1,1	1,4	1,2	1,5	2,7	3,5	2,8	3,6	0,055	0,08	0,11
0,075	0,1	1,2	1,6	1,3	1,7	3	4	3,1	4,2	0,055	0,09	0,13
0,08	0,11	1,3	1,7	1,4	1,9	3,2	4,2	3,3	4,6	0,06	0,1	0,15
0,09	0,13	1,4	2	1,5	2,2	3,5	4,5	3,6	5	0,07	0,1	0,16
0,1	0,14	1,6	2,2	1,7	2,4	4	5,5	4,2	5,7	0,08	0,12	0,18
0,11	0,15	1,7	2,4	1,8	2,6	4,2	6	4,6	6,2	0,09	0,13	0,2
0,12	0,17	1,9	2,6	2	2,9	4,7	6,7	4,8	6,9	0,1	0,14	0,22
0,13	0,19	2	3	2,2	3,2	5	7,5	5,2	7,7	0,11	0,15	0,24
0,15	0,21	2,4	3,4	2,6	3,6	6	8,2	6,2	8,4	0,12	0,17	0,26
0,17	0,23	2,6	3,6	2,9	3,9	6,5	9	5,8	9,2	0,13	0,19	0,29
0,2	0,26	3,1	4,1	3,4	4,4	7,7	10	8	10,4	0,13	0,2	0,31
0,21	0,28	3,3	4,4	3,6	4,8	8,2	11	8,4	11,2	0,16	0,23	0,35
0,24	0,32	3,7	5	4,1	5,4	9,2	12,5	9,6	12,8	0,17	0,25	0,36
0,26	0,35	4	5,4	4,4	5,9	10	13,5	10,4	14	0,2	0,29	0,41
0,3	0,4	4,6	6,2	5,1	6,8	11,5	15,5	12	16	0,21	0,31	0,45
0,34	0,45	5,3	7	5,8	7,6	13,3	17,5	13,6	18	0,23	0,35	0,51
0,37	0,5	5,7	7,8	6,3	8,5	14,3	19,5	14,8	20	0,27	0,39	0,57
0,41	0,55	6,3	8,5	7	9,4	15,8	21	16,4	22	0,3	0,43	0,64
0,45	0,6	6,8	9	7,6	10,2	17	23	18	24	0,32	0,48	0,7
0,49	0,65	7,4	9,8	8,3	11	18,5	25	19,6	26	0,34	0,54	0,77
0,55	0,72	8,3	10,8	9,3	12,1	21	27	22,2	28,3	0,36	0,59	0,84

Reduction in radial internal clearance

Reduction in radial internal clearance of FAG toroidal roller bearings with tapered bore

Nominal bearing bore diameter d mm		Radial internal clearance before mounting Internal clearance group					
		Group N mm		Group 3 mm		Group 4 mm	
over	incl.	min.	max.	min.	max.	min.	max.
24	30	0,035	0,055	0,050	0,065	0,065	0,085
30	40	0,045	0,065	0,060	0,080	0,080	0,100
40	50	0,050	0,075	0,070	0,095	0,090	0,120
50	65	0,060	0,090	0,085	0,115	0,110	0,150
65	80	0,075	0,110	0,105	0,140	0,135	0,180
80	100	0,095	0,135	0,130	0,175	0,170	0,220
100	120	0,115	0,155	0,155	0,205	0,200	0,255
120	140	0,135	0,180	0,180	0,235	0,230	0,295
140	160	0,155	0,215	0,210	0,270	0,265	0,340
160	180	0,170	0,240	0,235	0,305	0,300	0,385
180	200	0,190	0,260	0,260	0,330	0,325	0,420
200	225	0,210	0,290	0,285	0,365	0,360	0,460
225	250	0,235	0,315	0,315	0,405	0,400	0,515
250	280	0,255	0,345	0,340	0,445	0,440	0,560
280	315	0,280	0,380	0,375	0,485	0,480	0,620
315	355	0,315	0,420	0,415	0,545	0,540	0,680
355	400	0,350	0,475	0,470	0,600	0,595	0,755
400	450	0,380	0,525	0,525	0,655	0,650	0,835
450	500	0,435	0,575	0,575	0,735	0,730	0,915
500	560	0,470	0,640	0,630	0,810	0,800	1,010
560	630	0,530	0,710	0,700	0,890	0,880	1,110
630	710	0,590	0,780	0,770	0,990	0,980	1,230
710	800	0,670	0,860	0,860	1,100	1,100	1,380
800	900	0,730	0,960	0,950	1,220	1,210	1,530
900	1 000	0,810	1,040	1,040	1,340	1,340	1,670
1 000	1 120	0,890	1,170	1,160	1,500	1,490	1,880
1 120	1 250	0,970	1,280	1,270	1,640	1,630	2,060
1 250	1 400	1,080	1,410	1,410	1,790	1,780	2,250
1 400	1 600	1,200	1,550	1,550	1,990	1,990	2,500
1 600	1 800	1,320	1,690	1,690	2,180	2,180	2,730

[1] Valid only for solid steel shafts and hollow shafts with a bore no larger than half the shaft diameter.
The following applies: Bearings with a radial internal clearance before mounting in the upper half of the tolerance range are mounted using the larger value for the reduction in radial internal clearance or the axial drive-up distance, while bearings in the lower half of the tolerance range are mounted using the smaller value for the reduction in radial internal clearance or the axial drive-up distance.

[2] The actual value of the radial internal clearance must not be smaller than the control value. In the case of bearings with a small diameter, this may be difficult to determine.

Reduction in radial internal clearance[1]		Drive-up distance on taper 1:12[1]		Drive-up distance on taper 1:30[1]		Control value for radial internal clearance after mounting[2]		
		Shaft		Shaft		Group N	Group 3	Group 4
mm		mm		mm		mm	mm	mm
min.	max.	min.	max.	min.	max.	min.	min.	min.
0,010	0,017	0,24	0,29	0,61	0,72	0,025	0,035	0,048
0,014	0,021	0,30	0,34	0,76	0,84	0,031	0,041	0,059
0,018	0,028	0,37	0,42	0,91	1,04	0,033	0,046	0,062
0,024	0,035	0,46	0,50	1,14	1,24	0,036	0,054	0,075
0,030	0,046	0,55	0,61	1,37	1,53	0,045	0,065	0,090
0,040	0,056	0,67	0,73	1,68	1,83	0,056	0,080	0,114
0,049	0,069	0,79	0,89	1,98	2,23	0,066	0,093	0,131
0,060	0,083	0,91	1,05	2,29	2,62	0,075	0,105	0,147
0,072	0,095	1,04	1,21	2,59	3,02	0,083	0,123	0,170
0,081	0,107	1,16	1,36	2,90	3,41	0,089	0,137	0,193
0,090	0,121	1,28	1,52	3,20	3,81	0,100	0,150	0,204
0,101	0,134	1,43	1,68	3,58	4,20	0,109	0,162	0,226
0,113	0,151	1,59	1,88	3,96	4,69	0,123	0,177	0,249
0,126	0,168	1,77	2,08	4,42	5,19	0,129	0,186	0,273
0,142	0,188	1,98	2,31	4,95	5,78	0,138	0,203	0,292
0,160	0,211	2,23	2,59	5,56	6,47	0,155	0,221	0,329
0,180	0,238	2,50	2,90	6,25	7,26	0,170	0,251	0,357
0,203	0,268	2,81	3,26	7,01	8,15	0,178	0,279	0,382
0,225	0,300	3,11	3,66	7,78	9,14	0,210	0,300	0,430
0,250	0,335	3,48	4,05	8,69	10,13	0,220	0,325	0,465
0,285	0,375	3,90	4,52	9,76	11,31	0,245	0,355	0,505
0,320	0,420	4,39	5,08	10,98	12,69	0,270	0,380	0,560
0,360	0,475	4,94	5,71	12,35	14,27	0,310	0,425	0,625
0,405	0,535	5,55	6,42	13,88	16,05	0,325	0,460	0,675
0,450	0,605	6,16	7,21	15,40	18,03	0,360	0,490	0,735
0,505	0,670	6,89	8,00	17,23	20,00	0,385	0,545	0,820
0,565	0,750	7,69	8,95	19,21	22,37	0,410	0,580	0,880
0,630	0,840	8,60	9,98	21,50	24,94	0,450	0,640	0,940
0,720	0,940	9,82	11,16	24,55	27,90	0,480	0,685	1,050
0,810	1,070	11,04	12,74	27,60	31,85	0,510	0,705	1,110

FAG rolling bearing greases Arcanol – chemical/physical data

FAG rolling bearing greases Arcanol

Arcanol grease	Designation to DIN 51825	Classification
MULTI2	KP2K–30	Low-noise ball bearing grease for D ≦ 62 mm
MULTI3	K3K–20	Standard ball bearing/radial insert ball bearing grease for D > 62 mm
SPEED2,6	KPHC2/3K–40	Standard spindle bearing grease
MULTITOP	KPHC2N–40	Universal high performance grease
TEMP90	KP3P–40	Low-noise rolling bearing grease, up to +160 °C
TEMP110	KP2P–30	Universal grease for higher temperatures
TEMP120	KPHC2R–30	Grease for high temperatures and high loads
TEMP200	KFKP2U–30	Rolling bearing grease for T > +150 °C to +260 °C
LOAD150	KP2N–20	Multi-purpose grease for automotive applications, high performance grease for line contact
LOAD220	KP2N–20	Heavy duty grease, wide speed range
LOAD400	KP2K–20	Grease for high loads, shocks
LOAD460	KP1K–30	Grease for high loads, vibrations, low temperatures
LOAD1000	KP2K–20	Grease for high loads, shocks, large bearings
FOOD2	KPHC2K–30	Grease with foodstuffs approval
VIB3	KP3N–30	Grease for oscillating motion
BIO2	KPE2N–40	Grease with rapid biodegradability
CLEAN-M	KX2R–30	Clean room grease, grease resistant to radiation
MOTION2	KPFHC2K–40	High performance grease paste for oscillating applications and plain bearing arrangements

Type of grease Thickener Base oil	Operating temperature range °C	Upper continuous limit temperature $T_{upperlimit}$ °C	NLGI grade	Speed parameter $n \cdot d_M$ $min^{-1} \cdot mm$	Kinematic viscosity	
					at +40 °C mm^2/s	at +100 °C mm^2/s
Lithium soap Mineral oil	–30 to +120	+75	2	500 000	110	11
Lithium soap Mineral oil	–20 to +120	+75	3	500 000	110	12
Lithium soap Synthetic oil	–40 to +120	+80	2 to 3	2 000 000	25	6
Lithium soap Partially synthetic oil	–40 to +140	+80	2	800 000	82	12,5
Polycarbamide Partially synthetic oil	–40 to +160	+90	3	700 000	148	15,5
Lithium complex soap Partially synthetic oil	–30 to +160	+110	2	500 000	130	14,2
Polycarbamide Synthetic oil	–30 to +180	+120	2	300 000	400	40
PTFE Perfluoropolyether oil	–30 to +260	+200	2	300 000	550	49
Lithium complex soap Mineral oil	–20 to +140	+95	2	500 000	160	15,5
Lithium/calcium soap Mineral oil	–20 to +140	+80	2	500 000	245	20
Lithium/calcium soap Mineral oil	–20 to +120	+80	2	400 000	400	27
Lithium/calcium soap Mineral oil	–30 to +130	+80	1	400 000	400	25
Lithium/calcium soap Mineral oil	–20 to +130	+80	2	300 000	1 000	38
Aluminium complex soap White oil	–30 to +120	+70	2	400 000	150	18
Lithium complex soap Mineral oil	–30 to +150	+90	3	350 000	170	14
Lithium/calcium soap Synthetic oil	–40 to +150	+80	2	300 000	55	10
Polycarbamide Ether	–30 to +180	+90	2	850 000	103	12,8
Lithium soap Synthetic oil	–40 to +130	+75	2	500 000	50	8

Mounting and dismounting methods for rolling bearings

Bearing type	Bearing bore	d mm
Deep groove ball bearings Angular contact ball bearings Spindle bearings Four point contact bearings Self-aligning ball bearings Tapered roller bearings Barrel roller bearings Spherical roller bearings Toroidal bearings	Cylindrical	< 80 80 – 200 > 200
Cylindrical roller bearings Needle roller bearings	Cylindrical	< 80 80 – 200 > 200
Axial deep groove ball bearings Axial angular contact ball bearings Axial cylindrical roller bearings Axial spherical roller bearings	Cylindrical	< 80 80 – 200 > 200
Self-aligning ball bearings Self-aligning ball bearings with adapter sleeve Toroidal bearings Barrel roller bearings Barrel roller bearings with adapter sleeve Spherical roller bearings Spherical roller bearings with adapter sleeve Spherical roller bearings with withdrawal sleeve Adapter sleeve Withdrawal sleeve	Tapered	< 80 80 – 200 > 200
Cylindrical roller bearings, double row	Tapered	< 80 80 – 200 > 200

Symbols

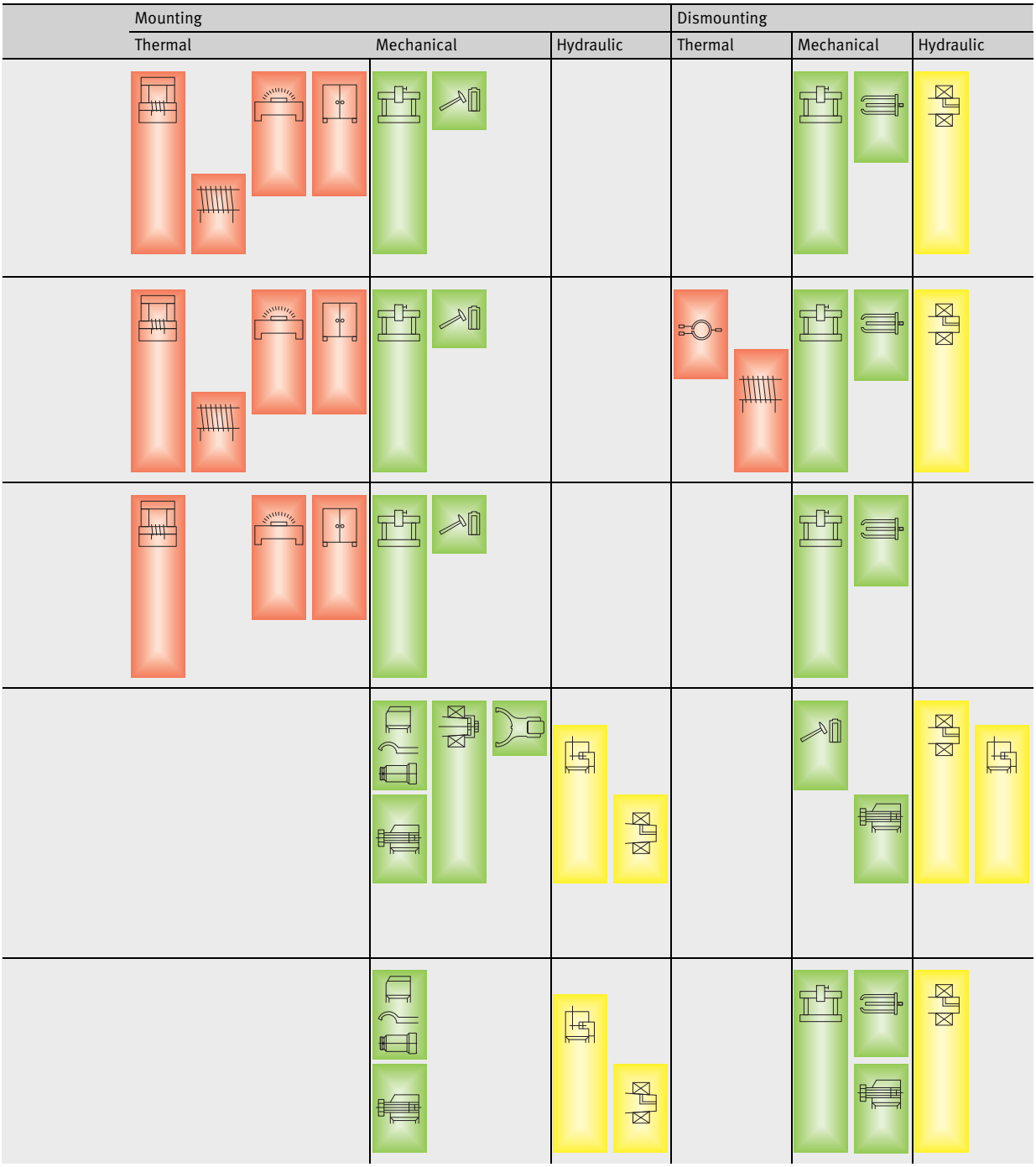
Induction heating device

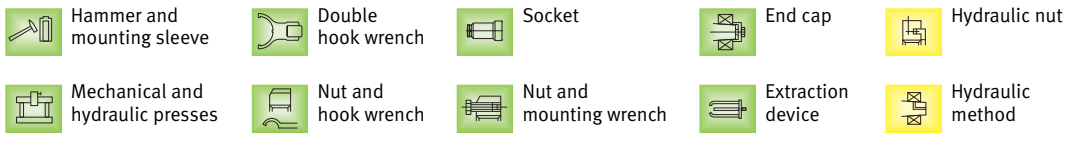
Heating cabinet

Heating ring

Heating plate

Medium frequency technology


Mounting
Thermal
Mechanical
Hydraulic
Dismounting
Thermal
Mechanical
Hydraulic


Hammer and mounting sleeve
Double hook wrench
Socket
End cap
Hydraulic nut
Mechanical and hydraulic presses
Nut and hook wrench
Nut and mounting wrench
Extraction device
Hydraulic method

Measurement record

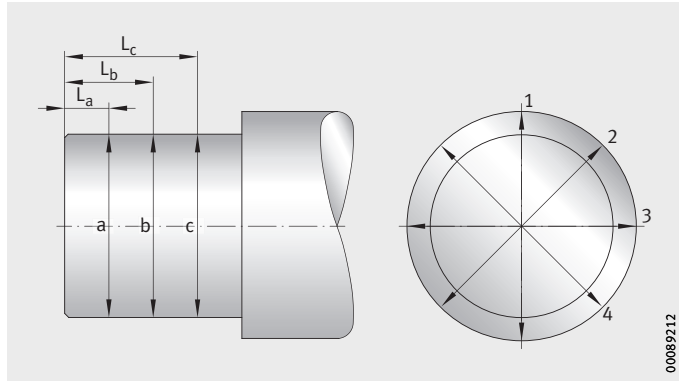


Figure 1
Shaft

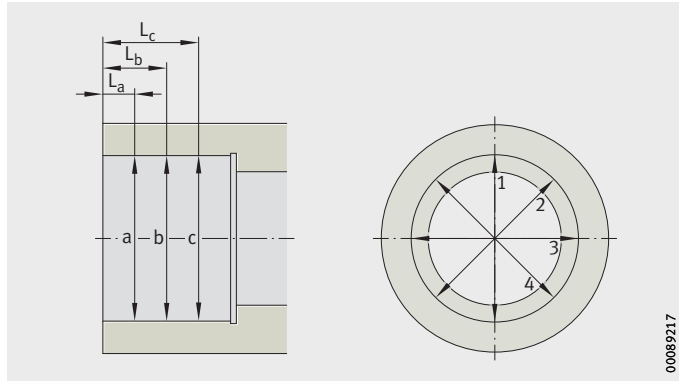


Figure 2
Housing

Measurement record for shaft

Spacing [mm]	L_a	L_b	L_c
Diameter [mm]	a	b	c
1			
2			
3			
4			
Mean value (1 + 2 + 3 + 4)/4			

Measurement record for housing

Spacing [mm]	L_a	L_b	L_c
Diameter [mm]	a	b	c
1			
2			
3			
4			
Mean value (1 + 2 + 3 + 4)/4			

Further information

Further information

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