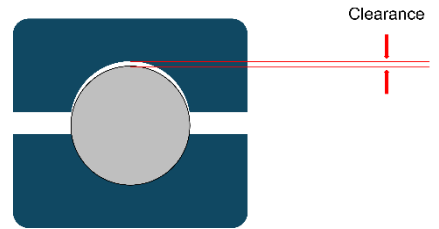


Bearing clearance

The effective bearing clearance – that is, the radial or axial play in the installed condition – results from the interaction between the selected clearance class, the fits of the shaft and housing, and the temperature influences occurring during operation.

For standard applications, the clearance class CN (also referred to as C0) is generally used. Both designations are equivalent, and this standard clearance is often not explicitly stated in order codes.



For small and miniature bearings with shaft diameters below 10 mm, additional clearance levels designated MC1 to MC6 are used for more precise classification. These levels allow fine tuning to meet particularly tight tolerance requirements. The standard clearance MC3 applies as the factory default.

Small & miniature bearings

Suffix		MC1	MC2	MC3	MC4	MC5	MC6
Span	min	0	3	5	8	13	20
	max	5	8	10	13	20	28

Deep groove ball bearing with cylindrical bore

d mm		Radial bearing clearance in μm							
		C2		CN		C3		C4	
over	to	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	1000	20	170	150	350	330	550	530	770

Double row self-aligning ball bearings with cylindrical bore

d		Radial bearing clearance in μm							
mm		C2		CN		C3		C4	
over	to	min.	max.	min.	max.	min.	max.	min.	max.
2,5	6	1	8	5	15	10	20	15	25
6	10	2	9	6	17	12	25	19	33
10	14	2	10	6	19	13	26	21	35
14	18	3	12	8	21	15	28	23	37
18	24	4	14	10	23	17	30	25	39
24	30	5	16	11	24	19	35	29	46
30	40	6	18	13	29	23	40	34	53
40	50	6	19	14	31	25	44	37	57
50	65	7	21	16	36	30	50	45	69
65	80	8	24	18	40	35	60	54	83
80	100	9	27	22	48	42	70	64	96
100	120	10	31	25	56	50	83	75	114
120	140	10	38	30	68	60	100	90	135
140	160	15	44	35	80	70	120	110	161
160	180	15	50	40	92	82	138	126	185
180	200	17	57	47	105	93	157	144	212
200	225	18	62	50	115	100	170	155	230
225	250	20	70	57	130	115	195	175	255
250	280	23	78	65	145	125	220	200	295
280	315	27	90	75	165	145	250	230	335
315	355	32	100	85	185	165	285	260	380
355	400	35	110	90	205	185	325	295	430
400	450	38	125	100	230	205	345	315	465
450	500	40	135	110	255	230	380	345	510

Double row self-aligning ball bearings with tapered bore

d		Radial bearing clearance in μm							
mm		C2		CN		C3		C4	
over	to	min.	max.	min.	max.	min.	max.	min.	max.
18	24	7	17	13	26	20	33	28	42
24	30	9	20	15	28	23	39	33	50
30	40	12	24	19	35	29	46	40	59
40	50	14	27	22	39	33	52	45	65
50	65	18	32	27	47	41	61	56	80
65	80	23	39	35	57	50	75	69	98
80	100	29	47	42	68	62	90	84	116
100	120	35	56	50	81	75	108	100	139
120	140	40	68	60	98	90	130	120	165
140	160	45	74	65	110	100	150	140	191
160	180	50	85	75	127	117	173	161	220
180	200	55	95	85	143	131	195	182	250
200	225	63	107	95	160	145	215	200	275
225	250	70	120	107	180	165	245	230	310
250	280	78	133	120	200	180	275	255	350
280	315	87	150	135	225	205	310	280	385
315	355	97	165	150	250	220	340	310	430
355	400	105	180	160	275	245	375	335	470
400	450	115	200	170	300	260	400	360	510
450	500	120	215	180	325	275	425	380	545

Cylindrical roller bearings with cylindrical bore and needle roller bearings

d mm		Radial bearing clearance in μm							
		C2		CN		C3		C4	
over	to	min.	max.	min.	max.	min.	max.	min.	max.
-	24	0	25	20	45	35	60	50	75
24	30	0	25	20	45	35	60	50	75
30	40	5	30	25	50	45	70	60	85
40	50	5	35	30	60	50	80	70	100
50	65	10	40	40	70	60	90	80	110
65	80	10	45	40	75	65	100	90	125
80	100	15	50	50	85	75	110	105	140
100	120	15	55	50	90	85	125	125	165
120	140	15	60	60	105	100	145	145	190
140	160	20	70	70	120	115	165	165	215
160	180	25	75	75	125	120	170	170	220
180	200	35	90	90	145	140	195	195	250
200	225	45	105	105	165	160	220	220	280
225	250	45	110	110	175	170	235	235	300
250	280	55	125	125	195	190	260	260	330
280	315	55	130	130	205	200	275	275	350
315	355	65	145	145	225	225	305	305	385
355	400	100	190	190	280	280	370	370	460
400	450	110	210	210	310	310	410	410	510
450	500	110	220	220	330	330	440	440	550
500	560	120	240	240	360	360	480	480	600
560	630	140	260	260	380	380	500	500	620
630	710	145	285	285	425	425	565	565	705
710	800	150	310	310	470	470	630	630	790
800	900	180	350	350	520	520	690	690	860
900	1000	200	390	390	580	580	770	770	960
1000	1120	220	430	430	640	640	850	850	1060
1120	1250	230	470	470	710	710	950	950	1190
1250	1400	270	530	530	790	790	1050	1050	1310

Cylindrical roller bearings with tapered bore

d mm		Radial bearing clearance in μm							
		C2		CN		C3		C4	
over	to	min.	max.	min.	max.	min.	max.	min.	max.
-	24	15	40	30	55	40	65	50	75
24	30	20	45	35	60	45	70	55	80
30	40	20	45	40	65	55	80	70	95
40	50	25	55	45	75	60	90	75	105
50	65	30	60	50	80	70	100	90	120
65	80	35	70	60	95	85	120	110	145
80	100	40	75	70	105	95	130	120	155
100	120	50	90	90	130	115	155	140	180
120	140	55	100	100	145	130	175	160	205
140	160	60	110	110	160	145	195	180	230
160	180	75	125	125	175	160	210	195	245
180	200	85	140	140	195	180	235	220	275
200	225	95	155	155	215	200	260	245	305
225	250	105	170	170	235	220	285	270	335
250	280	115	185	185	255	240	310	295	365
280	315	130	205	205	280	265	340	325	400
315	355	145	225	225	305	290	370	355	435
355	400	165	255	255	345	330	420	405	495

400	450	185	285	285	385	370	470	455	555
450	500	205	315	315	425	410	520	505	615
500	560	230	350	350	470	455	575	560	680
560	630	260	380	380	500	500	620	620	740
630	710	295	435	435	575	565	705	695	835
710	800	325	485	485	645	630	790	775	935
800	900	370	540	540	710	700	870	860	1030
900	1000	410	600	600	790	780	970	960	1150
1000	1120	455	665	665	875	865	1075	1065	1275
1120	1250	490	730	730	970	960	1200	1200	1440
1250	1400	550	810	810	1070	1070	1330	1330	1590

Double row spherical roller bearings with cylindrical bore

<i>d</i> mm		Radial bearing clearance in μm							
over	to	C2		CN		C3		C4	
		min.	max.	min.	max.	min.	max.	min.	max.
14	18	10	20	20	35	35	45	45	60
18	24	10	20	20	35	35	45	45	60
24	30	15	25	25	40	40	55	55	75
30	40	15	30	30	45	45	60	60	80
40	50	20	35	35	55	55	75	75	100
50	65	20	40	40	65	65	90	90	120
65	80	30	50	50	80	80	110	110	145
80	100	35	60	60	100	100	135	135	180
100	120	40	75	75	120	120	160	160	210
120	140	50	95	95	145	145	190	190	240
140	160	60	110	110	170	170	220	220	280
160	180	65	120	120	180	180	240	240	310
180	200	70	130	130	200	200	260	260	340
200	225	80	140	140	220	220	290	290	380
225	250	90	150	150	240	240	320	320	420
250	280	100	170	170	260	260	350	350	460
280	315	110	190	190	280	280	370	370	500
315	355	120	200	200	310	310	410	410	550
355	400	130	220	220	340	340	450	450	600
400	450	140	240	240	370	370	500	500	660
450	500	140	260	260	410	410	550	550	720
500	560	150	280	280	440	440	600	600	780
560	630	170	310	310	480	480	650	650	850
630	710	190	350	350	530	530	700	700	920
710	800	210	390	390	580	580	770	770	1010
800	900	230	430	430	650	650	860	860	1120
900	1000	260	480	480	710	710	930	930	1220
1000	1120	290	530	530	770	770	1050	1050	1430
1120	1250	320	580	580	840	840	1140	1140	1560

Double row spherical roller bearings with tapered bore

d		Radial bearing clearance in μm							
mm		C2		CN		C3		C4	
over	to	min.	max.	min.	max.	min.	max.	min.	max.
18	24	15	25	25	35	35	45	45	60
24	30	20	30	30	40	40	55	55	75
30	40	25	35	35	50	50	65	65	85
40	50	30	45	45	60	60	80	80	100
50	65	40	55	55	75	75	95	95	120
65	80	50	70	70	95	95	120	120	150
80	100	55	80	80	110	110	140	140	180
100	120	65	100	100	135	135	170	170	220
120	140	80	120	120	160	160	200	200	260
140	160	90	130	130	180	180	230	230	300
160	180	100	140	140	200	200	260	260	340
180	200	110	160	160	220	220	290	290	370
200	225	120	180	180	250	250	320	320	410
225	250	140	200	200	270	270	350	350	450
250	280	150	220	220	300	300	390	390	490
280	315	170	240	240	330	330	430	430	540
315	355	190	270	270	360	360	470	470	590
355	400	210	300	300	400	400	520	520	650
400	450	230	330	330	440	440	570	570	720
450	500	260	370	370	490	490	630	630	790
500	560	290	410	410	540	540	680	680	870
560	630	320	460	460	600	600	760	760	980
630	710	350	510	510	670	670	850	850	1090
710	800	390	570	570	750	750	960	960	1220

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