

DIN 472-2017
Retaining rings for bores –Normal type and heavy type

The designs shown in Figure 1 are for illustrative purposes only; however, the dimensions of retaining rings and grooves shall be as specified in Tables 1 and 2. The tolerances specified relate to retaining rings in their Unstressed Shape of ring at manufacturer's discretion uncoated condition; For other unspecified technical requirements, refer to DIN472-2017.

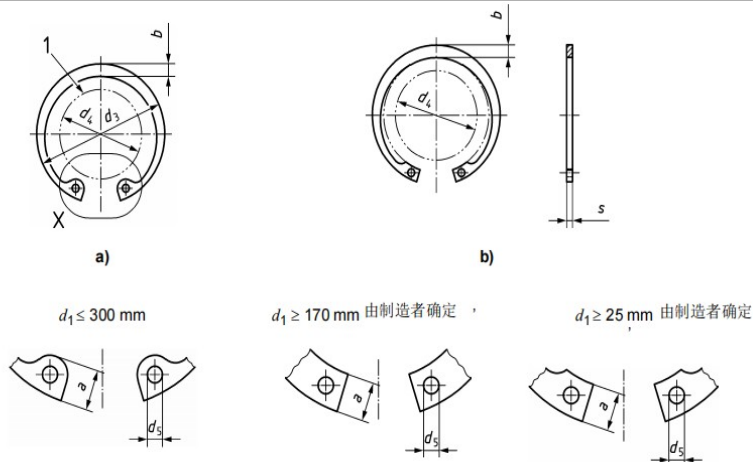


Figure 1 — Dimensions of

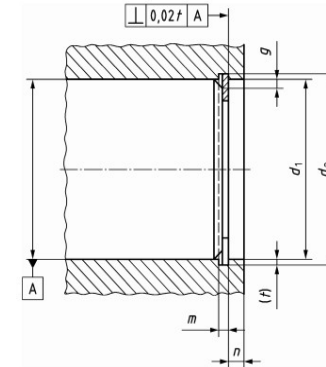


Figure 2 — Example of installation

Table 1 — Normal type

Dimensions in millimetres

Nominal size d1	Ring							Groove		Supplementary data			Performance and other tests					
	s	s perm. dev.	d3	d3 perm. dev.	a max	b① ≈	d5 min	d2	d2 perm. dev.	d4	Fn kN	Fr kN	Testing the spiral flatness	Hardness (QT)	Testing the conical deformation		The outer diameter has contracted three consecutive times to (d3 × 0.99)	
													d1≤100:s×1.5 d1>100:s×1.8	HRC (HV)	Force F N ± 5 %	h-s Max	d6②	d3>d2 min
8	0.8	0 -0.05	8.7	0.35 -0.10	2.4	1.1	1.0	8.4	0.09 -0	3.0	0.86	2.00	1.20	470-580HV	30	0.033	7.92	8.49
9	0.8		9.8		2.5	1.3	1.0	9.4		3.7	0.96	2.00	1.20	470-580HV	30	0.039	8.91	9.49
10	1.0		10.8		3.2	1.4	1.2	10.4	0.11 -0	3.3	1.08	4.00	1.50	470-580HV	30	0.042	9.90	10.51
11	1.0		11.8		3.3	1.5	1.2	11.4		4.1	1.17	4.00	1.50	470-580HV	30	0.045	10.89	11.51
12	1.0		13.0		3.4	1.7	1.5	12.5		4.9	1.60	4.00	1.50	470-580HV	30	0.051	11.88	12.61
13	1.0		14.1		3.6	1.8	1.5	13.6		5.4	2.10	4.20	1.50	470-580HV	30	0.054	12.87	13.71
14	1.0		15.1		3.7	1.9	1.7	14.6		6.2	2.25	4.50	1.50	470-580HV	30	0.057	13.86	14.71
15	1.0		16.2		3.7	2.0	1.7	15.7		7.2	2.80	5.00	1.50	470-580HV	30	0.060	14.85	15.81

16	1.0	0 -0.06	17.3	0.42 -0.13	3.8	2.0	1.7	16.8	0.13 -0	8.0	3.40	5.50	1.50	470-580HV	30	0.060	15.84	16.91
17	1.0		18.3		3.9	2.1	1.7	17.8		8.8	3.60	6.00	1.50	470-580HV	30	0.063	16.83	17.91
18	1.0		19.5		4.1	2.2	2.0	19.0		9.4	4.80	6.50	1.50	470-580HV	30	0.066	17.82	19.13
19	1.0		20.5		4.1	2.2	2.0	20.0		10.4	5.10	6.80	1.50	470-580HV	30	0.066	18.81	20.13
20	1.0		21.5		4.2	2.3	2.0	21.0		11.2	5.40	7.20	1.50	470-580HV	30	0.069	19.80	21.13
21	1.0		22.5		4.2	2.4	2.0	22.0		12.2	5.70	7.60	1.50	470-580HV	30	0.072	20.79	22.13
22	1.0		23.5	0.42 -0.21	4.2	2.5	2.0	23.0	0.21 -0	13.2	5.90	8.00	1.50	470-580HV	30	0.075	21.78	23.13
24	1.2		25.9		4.4	2.6	2.0	25.2		14.8	7.70	13.90	1.80	47-54	40	0.078	23.76	25.41
25	1.2		26.9		4.5	2.7	2.0	26.2		15.5	8.00	14.60	1.80	47-54	40	0.081	24.75	26.41
26	1.2		27.9		4.7	2.8	2.0	27.2		16.1	8.40	13.85	1.80	47-54	40	0.084	25.74	27.41
28	1.2		30.1	0.50 -0.25	4.8	2.9	2.0	29.4	0.25 -0	17.9	10.50	13.30	1.80	47-54	40	0.087	27.72	29.61
30	1.2		32.1		4.8	3.0	2.0	31.4		19.9	11.30	13.70	1.80	47-54	40	0.090	29.70	31.65
31	1.2		33.4		5.2	3.2	2.5	32.7		20.0	14.10	13.80	1.80	47-54	40	0.096	30.69	32.95
32	1.2		34.4		5.4	3.2	2.5	33.7		20.6	14.60	13.80	1.80	47-54	40	0.096	31.68	33.95
34	1.5		36.5		5.4	3.3	2.5	35.7		22.6	15.40	26.20	2.25	47-54	40	0.099	33.66	35.95
35	1.5		37.8		5.4	3.4	2.5	37.0		23.6	18.80	26.90	2.25	47-54	40	0.102	34.65	37.25
36	1.5		38.8		5.4	3.5	2.5	38.0		24.6	19.40	26.40	2.25	47-54	40	0.105	35.64	38.25
37	1.5		39.8		5.5	3.6	2.5	39.0		25.4	19.80	27.1	2.25	47-54	40	0.108	36.63	39.25
38	1.5		40.8		5.5	3.7	2.5	40.0		26.4	22.50	28.2	2.25	47-54	40	0.111	37.62	40.25
40	1.75		43.5	0.90 -0.39	5.8	3.9	2.5	42.5	0.30	27.8	27.00	44.6	2.63	47-54	60	0.117	39.60	42.75
42	1.75		45.5		5.9	4.1	2.5	44.5		29.6	28.40	44.7	2.63	47-54	60	0.123	41.58	44.75
45	1.75		48.5		6.2	4.3	2.5	47.5		32.0	30.20	43.1	2.63	47-54	60	0.129	44.55	47.75
47	1.75		50.5	1.1 -0.46	6.4	4.4	2.5	49.5		33.5	31.40	43.5	2.63	47-54	60	0.132	46.53	49.75
48	1.75		51.5		6.4	4.5	2.5	50.5		34.5	32.00	43.2	2.63	47-54	60	0.135	47.52	50.80
50	2.0		54.2		6.5	4.6	2.5	53.0		36.3	40.50	60.8	3.00	44-51	60	0.138	49.50	53.30
52	2.0		56.2		6.7	4.7	2.5	55.0		37.9	42.00	60.25	3.00	44-51	60	0.141	51.48	55.30
55	2.0		59.2		6.8	5.0	2.5	58.0		40.7	44.40	60.3	3.00	44-51	60	0.150	54.45	58.30
56	2.0		60.2		6.8	5.1	2.5	59.0		41.7	45.20	60.3	3.00	44-51	60	0.153	55.44	59.30
58	2.0		62.2		6.9	5.2	2.5	61.0		43.5	46.70	60.8	3.00	44-51	60	0.156	57.42	61.30
60	2.0		64.2		7.3	5.4	2.5	63.0		44.7	48.30	61.0	3.00	44-51	60	0.162	59.40	63.30

62	2.0	0 -0.07	66.2		7.3	5.5	2.5	65.0	-0	46.7	49.80	60.9	3.00	44-51	60	0.165	61.38	65.30
63	2.0		67.2		7.3	5.6	2.5	66.0		47.7	50.60	60.8	3.00	44-51	60	0.168	62.37	66.30
65	2.5		69.2		7.6	5.8	3.0	68.0		49.0	51.80	121.0	3.75	44-51	60	0.174	64.35	68.30
68	2.5		72.5		7.8	6.1	3.0	71.0		51.6	51.50	121.5	3.75	44-51	60	0.183	67.32	71.30
70	2.5		74.5		7.8	6.2	3.0	73.0		53.6	56.20	119.0	3.75	44-51	60	0.186	69.30	73.30
72	2.5		76.5		7.8	6.4	3.0	75.0		55.6	58.00	119.2	3.75	44-51	60	0.192	71.28	75.30
75	2.5		79.5		7.8	6.6	3.0	78.0		58.6	60.00	118.0	3.75	44-51	60	0.198	74.25	78.30
78	2.5	0 -0.08	82.5	1.3 -0.54	8.5	6.6	3.0	81.0	0.35 -0	60.1	62.30	122.5	3.75	44-51	60	0.198	77.22	81.35
80	2.5		85.5		8.5	6.8	3.0	83.5		62.1	74.60	120.9	3.75	44-51	60	0.204	79.20	83.85
82	2.5		87.5		8.5	7.0	3.0	85.5		64.1	76.60	119.0	3.75	44-51	60	0.140	81.18	85.85
85	3.0		90.5		8.6	7.0	3.5	88.5		66.9	79.50	201.4	4.50	44-51	80	0.140	84.15	88.85
88	3.0		93.5		8.6	7.2	3.5	91.5		69.9	82.10	209.4	4.50	44-51	80	0.144	87.12	91.85
90	3.0		95.5		8.6	7.6	3.5	93.5		71.9	84.00	199	4.50	44-51	80	0.152	89.10	93.85
92	3.0		97.5		8.7	7.8	3.5	95.5		73.7	85.80	201	4.50	44-51	80	0.156	91.08	95.85
95	3.0		100.5		8.8	8.1	3.5	98.5		76.5	88.60	195	4.50	44-51	80	0.162	94.05	98.85
98	3.0		103.5		9.0	8.3	3.5	101.5		79.0	91.30	191	4.50	44-51	80	0.166	97.02	101.85
100	3.0		105.5		9.2	8.4	3.5	103.5		80.6	93.10	188	4.50	44-51	80	0.168	99.00	103.85
102	4.0	0 -0.1	108	1.5 -0.63	9.5	8.5	3.5	106	0.54 -0	82.0	108.80	439	7.2	44-51	80	0.170	100.98	106.54
105	4.0		112		9.5	8.7	3.5	109		85.0	112.00	436	7.2	44-51	80	0.174	103.95	109.54
108	4.0		115		9.5	8.9	3.5	112.0		88.0	115.00	419	7.2	44-51	80	0.178	106.92	112.54
110	4.0		117		10.4	9.0	3.5	114.0		88.2	117.00	415	7.2	44-51	80	0.180	108.90	114.54
112	4.0		119		10.5	9.1	3.5	116.0		90.0	119.00	418	7.2	44-51	80	0.182	110.88	116.54
115	4.0		122		10.5	9.3	3.5	119.0		93.0	122.00	409	7.2	44-51	80	0.186	113.85	119.54
120	4.0		127		11.0	9.7	3.5	124.0	0.63 -0	96.9	127.00	396	7.2	44-51	80	0.194	118.80	124.63
125	4.0		132		11.0	10.0	4.0	129.0		101.9	132.00	385	7.2	44-51	80	0.200	123.75	129.63
130	4.0		137		11.0	10.2	4.0	134.0		106.9	138.00	374	7.2	44-51	80	0.204	128.70	134.63
135	4.0		142		11.2	10.5	4.0	139.0		111.5	148.00	358	7.2	44-51	80	0.210	133.65	139.63
140	4.0		147		11.2	10.7	4.0	144.0		116.5	148.00	350	7.2	44-51	80	0.214	138.60	144.63
145	4.0		152		11.4	10.9	4.0	149.0		121.0	153.00	336	7.2	44-51	80	0.218	143.55	149.63
150	4.0		158		12.0	11.2	4.0	155.0		124.8	191.00	326	7.2	44-51	80	0.224	148.50	155.63

155	4.0		164		12.0	11.4	4.0	160.0		129.8	206.00	324	7.2	44-51	150	0.228	153.45	160.63
160	4.0		169		13.0	11.6	4.0	165.0		132.7	212.00	321	7.2	44-51	150	0.232	158.40	165.63
165	4.0		174.5		13.0	11.8	4.0	170.0		137.7	219.00	319	7.2	44-51	150	0.236	163.35	170.63
170	4.0		179.5		13.5	12.2	4.0	175.0		141.6	225.00	349	7.2	44-51	150	0.244	168.30	175.63
175	4.0		184.5		13.5	12.7	4.0	180.0		146.6	232.00	351	7.2	44-51	150	0.254	173.25	180.63
180	4.0		189.5		14.2	13.2	4.0	185.0		150.2	238.00	347	7.2	44-51	150	0.264	178.20	185.72
185	4.0		194.5		14.2	13.7	4.0	190.0		155.2	245.00	349	7.2	44-51	150	0.274	183.15	190.72
190	4.0		199.5		14.2	13.8	4.0	195.0		160.2	251.0	340	7.2	44-51	150	0.276	188.10	195.72
195	4.0		204.5		14.2	14.0	4.0	200.0		165.2	258.0	330	7.2	44-51	150	0.280	193.05	200.72
200	4.0		209.5		14.2	14.0	4.0	205.0		170.2	265.0	325	7.2	44-51	150	0.280	198.00	205.72
210	5.0		222.0		14.2	14.0	4.0	216.0		180.2	333.0	601	9.0	40-47	150	0.280	207.90	216.72
220	5.0		232.0		14.2	14.0	4.0	226.0		190.2	349.0	574	9.0	40-47	150	0.280	217.80	226.72
230	5.0		242.0		14.2	14.0	4.0	236.0		200.2	365.0	549	9.0	40-47	150	0.280	227.70	236.72
240	5.0		252.0		14.2	14.0	4.0	246.0		210.2	380.0	525	9.0	40-47	150	0.280	237.60	246.72
250	5.0		262.0		16.2	16.0	5.0	256.0		220.2	396.0	504	9.0	40-47	150	0.320	247.50	256.81
260	5.0		275.0		16.2	16.0	5.0	268.0		226.0	553.0	538	9.0	40-47	150	0.320	257.40	268.81
270	5.0		285.0		16.2	16.0	5.0	278.0		236.0	573.0	518	9.0	40-47	150	0.320	267.30	278.81
280	5.0		295.0		16.2	16.0	5.0	288.0		246.0	593.0	499	9.0	40-47	150	0.320	277.20	288.81
290	5.0		305.0		16.2	16.0	5.0	298.0		256.0	615.0	482	9.0	40-47	150	0.320	287.10	298.81
300	5.0		315.0		16.2	16.0	5.0	308.0		266.0	636.0	466	9.0	40-47	150	0.320	297.00	308.81

①: Dimension b shall not exceed dimension a max.

②:Elasticity test to measure the dimension of the contracted outer diameter

Table 2 — Heavy type																		
Dimensions in millimetres																		
Nominal size d1	Ring							Groove		Supplementary datad								
	s	s perm. dev.	d3	d ₃ perm. dev.	a max	b① ≈	d5 min	d ₂	d ₂ perm. dev.	d4	Fn kN	Fr kN	Testing the spiral flatness	Hardness (QT)	Testing the conical deformation		The outer diameter has contracted three consecutive times to (d3)	
													d1≤100:s×1.5 d1>100:s×1.8	HRC (HV)	Force F N ± 5 %	h-s Max	d ₆ ②	d3↗d ₂ min
20	1.50		21.5		4.5	2.4	2.0	21.0		10.5	5.4	16.0	2.25	47-54	60	0.072	19.80	21.13
22	1.50		23.5		4.7	2.8	2.0	23.0	0.13 -0.0	12.1	5.9	18.0	2.25	47-54	60	0.084	21.78	23.13
24	1.50		25.9	0.42 -0.21	4.9	3.0	2.0	25.2		13.7	7.7	21.7	2.25	47-54	80	0.090	23.76	25.33

25	1.50	0 -0.06	26.9	0.50 -0.25	5.0	3.1	2.0	26.2	0.21 -0.0	14.5	8.0	22.8	2.25	47-54	80	0.093	24.75	26.41
26	1.50		27.9		5.1	3.1	2.0	27.2		15.3	8.4	21.6	2.25	47-54	80	0.093	25.74	27.41
28	1.50		30.1		5.3	3.2	2.0	29.4		16.9	10.5	20.8	2.25	47-54	80	0.096	27.72	29.61
30	1.50		32.1		5.5	3.3	2.0	31.4	0.25 -0.0	18.4	11.3	21.4	2.25	47-54	80	0.099	29.70	31.65
32	1.50		34.4		5.7	3.4	2.0	33.7		20.0	14.6	21.4	2.25	47-54	80	0.102	31.68	33.95
34	1.75		36.5		5.9	3.7	2.5	35.7		21.6	15.4	35.6	2.63	47-54	80	0.111	33.66	35.95
35	1.75		37.8		6.0	3.8	2.5	37.0		22.4	18.8	36.6	2.63	47-54	80	0.114	34.65	37.25
37	1.75		39.8		6.2	3.9	2.5	39.0		24.0	19.8	36.8	2.63	47-54	80	0.117	36.63	39.25
38	2.00		40.8		6.3	3.9	2.5	40.0		24.7	22.5	38.3	3.00	47-54	80	0.117	37.62	40.25
40	2.00	0 -0.07	43.5	0.90 -0.39	6.5	3.9	2.5	42.5		26.3	27.0	58.4	3.00	47-54	120	0.117	39.60	42.75
42	2.00		45.5		6.7	4.1	2.5	44.5		27.9	28.4	58.5	3.00	47-54	120	0.123	41.58	44.75
45	2.00		48.5		7.0	4.3	2.5	47.5		30.3	30.2	56.5	3.00	47-54	120	0.129	44.55	47.75
47	2.00		50.5	1.1 -0.46	7.2	4.4	2.5	49.5	0.30 -0.0	31.9	31.4	57.0	3.00	47-54	120	0.132	46.53	49.75
50	2.50		54.2		7.5	4.6	2.5	53.0		34.2	40.5	95.5	3.75	44-51	120	0.138	49.50	53.30
52	2.50		56.2		7.7	4.7	2.5	55.0		35.8	42.0	94.6	3.75	44-51	120	0.141	51.48	55.30
55	2.50		59.2		8.0	5.0	2.5	58.0		38.2	44.4	94.7	3.75	44-51	120	0.150	54.45	58.30
60	3.0	0 -0.08	64.2		8.5	5.4	2.5	63.0		42.1	48.3	137.0	4.50	44-51	120	0.162	59.40	63.30
62	3.0		66.2		8.6	5.5	2.5	65.0		43.9	49.8	137.0	4.50	44-51	120	0.165	61.38	65.30
65	3.0		69.2		8.7	5.8	3.0	68.0		46.7	51.8	174.0	4.50	44-51	120	0.174	64.35	68.30
68	3.0		72.5		8.8	6.1	3.0	71.0		49.5	54.5	174.0	4.50	44-51	120	0.183	67.32	71.30
70	3.0		74.5		9.0	6.2	3.0	73.0		51.1	56.2	171.0	4.50	44-51	120	0.186	69.30	73.30
72	3.0		76.5		9.2	6.4	3.0	75.0		52.7	58.0	172.0	4.50	44-51	120	0.192	71.28	75.30
75	3.0		79.5		9.3	6.6	3.0	78.0		55.5	60.0	170.0	4.50	44-51	120	0.198	74.25	78.30
80	4.0	0 -0.1	85.5	1.3 -0.54	9.5	7.0	3.0	83.5	0.35 -0.0	60.0	74.6	308.0	6.00	44-51	120	0.210	79.20	83.85
85	4.0		90.5		9.7	7.2	3.5	88.5		64.6	79.5	358.0	6.00	44-51	160	0.144	84.15	88.85
90	4.0		95.5		10.0	7.6	3.5	93.5		69.0	84.0	354.0	6.00	44-51	160	0.152	89.10	93.85
95	4.0		100.5		10.3	8.1	3.5	98.5		73.4	88.6	347.0	6.00	44-51	160	0.162	94.05	98.85
100	4.0		105.5		10.5	8.4	3.5	103.5		78.0	93.1	335.0	6.00	44-51	160	0.168	99.00	103.85

①: Dimension b shall not exceed dimension a max.