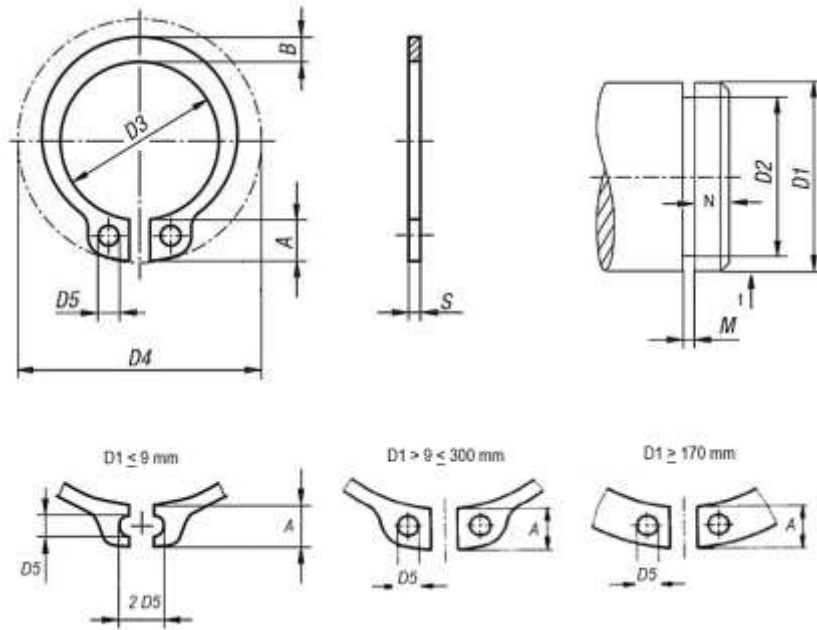


Metric DIN 471 External Retaining Rings for Shafts

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Dimensions of Metric DIN 471 Retaining Rings for Shafts

Shaft Dia	Clip						Groove					Supplementary data					Nominal size of pliers per DIN 5254									
	d1	s	d3	a	b	d5	d2	m	n	d4	FR	FRg	nabl	weight kg/1000pcs	per. dev.	H13		t	min.	kN	FN	kN	g	kN	min-1	
3	0.4	0	2.7	1.9	0.8	1	2.8	0	0.5	0.1	0.3	7	0.15	0.47	0.5	0.27	360000									3
4	0.4	-0.05	3.7	2.2	0.9	1	3.8	-0.04	0.5	0.1	0.3	8.6	0.2	0.5	0.5	0.3	211000									
5	0.6		4.7	2.5	1.1	1	4.8	-0.048	0.7	0.1	0.3	10.2	0.26	1	0.5	0.8	154000									
6	0.7		5.6	2.7	1.3	1.2	5.7	(h10)	0.8	0.15	0.5	11.7	0.46	1.45	0.5	0.9	114000									
7	0.8		6.5	3.1	1.4	1.2	6.7	0	0.9	0.15	0.5	13.5	0.54	2.6	0.5	1.4	121000									
8	0.8		7.4	3.2	1.5	1.2	7.6	-0.06	0.9	0.2	0.6	14.7	0.81	3	0.5	2	96000									
9	1	0	8.4	3.3	1.7	1.2	8.6	(h10)	1.1	0.2	0.6	16	0.92	3.5	0.5	2.4	85000									

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Shaft Dia		Clip							Groove					Supplementary data					Nominal size of pliers per DIN 5254	
d1	s	d3		a	b	d5	weight kg/1000pcs	d2		m	t	n	d4	FN	FR	g	FRg	nabl		
Nominal size	per. dev.	per. dev.	max.	approx.	min.	per. dev.		H13	min.	kN		kN	kN		min-1					
10	1	-0.06	9.3	0.1	3.3	1.8	1.5	0.34	9.6		1.1	0.2	0.6	17	1.01	4	1	2.4	84000	10
11	1		10.2	-0.4	3.3	1.8	1.5	0.41	10.5	0	1.1	0.25	0.8	18	1.4	4.5	1	2.4	70000	
12	1		11		3.3	1.8	1.7	0.5	11.5	-0.11	1.1	0.25	0.8	19	1.53	5	1	2.4	75000	
13	1		11.9		3.4	2	1.7	0.53	12.4	(h11)	1.1	0.3	0.9	20.2	2	5.8	1	2.4	66000	
14	1		12.9		3.5	2.1	1.7	0.64	13.4		1.1	0.3	0.9	21.4	2.15	6.35	1	2.4	58000	
15	1		13.8		3.6	2.2	1.7	0.67	14.3		1.1	0.35	1.1	22.6	2.66	6.9	1	2.4	50000	
16	1		14.7		3.7	2.2	1.7	0.7	15.2		1.1	0.4	1.2	23.8	3.26	7.4	1	2.4	45000	
17	1		15.7		3.8	2.3	1.7	0.82	16.2		1.1	0.4	1.2	25	3.46	8	1	2.4	41000	
18	1.2		16.5		3.9	2.4	2	1.11	17		1.3	0.5	1.5	26.2	4.58	17	1.5	3.75	39000	
19	1.2		17.5		3.9	2.5	2	1.22	18		1.3	0.5	1.5	27.2	4.84	17	1.5	3.8	35000	
20	1.2		18.5	0.13	4	2.6	2	1.3	19	0	1.3	0.5	1.5	28.4	5.06	17.1	1.5	3.85	32000	
21	1.2		19.5	-0.4	4.1	2.7	2	1.42	20	-0.13	1.3	0.5	1.5	29.6	5.36	16.8	1.5	3.75	29000	
22	1.2		20.5		4.2	2.8	2	1.5	21	(h11)	1.3	0.5	1.5	30.8	5.65	16.9	1.5	3.8	27000	
24	1.2		22.2	0.21	4.4	3	2	1.77	22.9	0	1.3	0.55	1.7	33.2	6.75	16.1	1.5	3.65	27000	
25	1.2		23.2	-0.4	4.4	3	2	1.9	23.9	-0.21	1.3	0.55	1.7	34.2	7.05	16.2	1.5	3.7	25000	
26	1.2		24.2		4.5	3.1	2	1.96	24.9	(h12)	1.3	0.55	1.7	35.5	7.34	16.1	1.5	3.7	24000	
28	1.5		25.9		4.7	3.2	2	2.92	26.6		1.6	0.7	2.1	37.9	10	32.1	1.5	7.5	21200	
29	1.5		26.9		7.8	3.4	2	3.2	27.6		1.6	0.7	2.1	39.1	10.4	31.8	1.5	7.45	20000	
30	1.5		27.9		5	3.5	2	3.31	28.6		1.6	0.7	2.1	40.5	10.7	32.1	1.5	7.65	18900	
32	1.5		29.6		5.2	3.6	2.5	3.54	30.3	0	1.6	0.85	2.6	43	13.9	31.2	2	5.55	16900	
34	1.5		31.5	0.25	5.4	3.8	2.5	3.8	32.3	-0.25	1.6	0.85	2.6	45.4	14.7	31.3	2	5.6	16100	
35	1.5		32.2	-0.5	5.6	3.9	2.5	4	33	(h12)	1.6	1	3	46.8	17.8	30.8	2	5.55	15500	
36	1.8		33.2		5.6	4	2.5	5	34		1.85	1	3	47.8	18.3	49.4	2	9	14500	
38	1.8		35.2		5.8	4.2	2.5	5.62	36		1.85	1	3	50.2	19.3	49.5	2	9.1	13600	

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Shaft Dia	Clip								Groove					Supplementary data					Nominal size of pliers per DIN 5254
	d1	s	d3		a	b	d5	weight kg/1000pcs	d2	m	n		d4	FR		FRg	nabl		
Nominal size	per. dev.	per. dev.	max.	approx.	min.		per. dev.		H13	t	min.	kN	FN	kN	g	kN	min-1		
40	1.8		36.5	0.39	6	4.4	2.5	6.03	37.5		1.85	1.25	3.8	52.6	25.3	51	2	9.5	14300
42	1.8		38.5	-0.9	6.5	4.5	2.5	6.5	39.5		1.85	1.25	3.8	55.7	26.7	50	2	9.45	13000
45	1.8		41.5		6.7	4.7	2.5	7.5	42.5		1.85	1.25	3.8	59.1	28.6	49	2	9.35	11400
48	2		44.5		6.9	5	2.5	7.9	45.5		1.85	1.25	3.8	62.5	30.7	49.4	2	9.55	10300
50	2	0	45.8		6.9	5.1	2.5	10.2	47		2.15	1.5	4.5	64.5	38	73.3	2	14.4	10500
52	2	-0.07	47.8		7	5.2	2.5	11.1	49		2.15	1.5	4.5	66.7	39.7	73.1	2.5	11.5	9850
55	2		50.8	0.46	7.2	5.4	2.5	11.4	52	0	2.15	1.5	4.5	70.2	42	71.4	2.5	11.4	8960
56	2		51.8	-1.1	7.3	5.5	2.5	11.8	53	-0.3	2.15	1.5	4.5	71.6	42.8	70.8	2.5	11.4	8670
58	2		53.8		7.3	5.6	2.5	12.6	55	(h12)	2.15	1.5	4.5	73.6	44.3	71.1	2.5	11.5	8200
60	2		55.8		7.4	5.8	2.5	12.9	57		2.15	1.5	4.5	75.6	46	69.2	2.5	11.3	7620
62	2		57.8		7.5	6	2.5	1.3	59		2.15	1.5	4.5	77.8	47.5	69.3	2.5	11.5	7240
63	2		58.8		7.6	6.2	2.5	15.9	60		2.15	1.5	4.5	79	48.3	70.2	2.5	11.6	7050
65	2.5		60.8		7.8	6.3	3	18.2	62		2.65	1.5	4.5	81.4	49.8	136	2.5	22.7	6640
68	2.5		63.5		8	6.2	3	21.8	65		2.65	1.5	4.5	84.8	52.2	136	2.5	23.1	6910
70	2.5		65.5		8.1	6.6	3	22	67		2.65	1.5	4.5	87	53.8	134	2.5	23	6530
72	2.5		67.5		8.2	6.8	3	22.5	69		2.65	1.5	4.5	89.2	55.3	132	2.5	22.8	6190
75	2.5		70.5		8.4	7	3	24.6	72		2.65	1.5	4.5	92.7	57.6	130	2.5	22.8	5740
78	2.5		73.5		8.6	7.3	3	26.2	75		2.65	1.5	4.5	96.1	60	131	3	19.8	5450
80	2.5		74.5		8.6	7.4	3	27.3	76.5		2.65	1.75	5.3	98.1	71.6	128	3	19.5	6100
82	2.5		76.5		8.7	7.6	3	31.2	78.5		2.65	1.75	5.3	100	73.5	128	3	19.6	5860

All measurements are in mm

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Shaft Dia		Clip						Groove						Supplementary data						Nominal size of pliers per DIN 5254
d1	s	d3		a	b	d5	d2		m	n		d4	FR		FRg		nabl			
Nominal size	per. dev.	per. dev.	max.	approx.	min.	weight kg/1000pcs	per. dev.	H13	t	min.	kN	FN	kN	g	kN	min-1				
85	3	0	79.5		8.7	7.8	3.5	36.4	81.5	0	3.15	1.75	5.3	103	76.2	215	3	33.4	5710	85
88	3	-0.08	82.5	0.54	8.8	8	3.5	41.2	84.5	-0.35	3.15	1.75	5.3	107	79	222	3	34.9	5200	
90	3		84.5	-1.3	8.8	8.2	3.5	44.5	86.5	(h12)	3.15	1.75	5.3	109	80.8	217	3	34.4	4980	
95	3		89.5		9.4	8.6	3.5	49	91.5		3.15	1.75	5.3	115	85.5	212	3.5	29.3	4550	
100	3	0	94.5		9.6	9	3.5	53.7	96.5		3.15	1.75	5.3	120	90	206	3.5	29	4180	
105	4	-0.1	98		9.9	9.3	3.5	80	101	0	4.15	2	6	126	108	472	3.5	67.7	4740	
110	4		103		10	9.6	3.5	82	106	-0.54	4.15	2	6	131	113	457	3.5	66.9	4340	
115	4		108		11	9.8	3.5	84	111	(h13)	4.15	2	6	137	118	439	3.5	65.5	3970	
120	4		113		11	10.2	3.5	86	116		4.15	2	6	143	124	427	3.5	64.5	3685	

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Shaft Dia		Clip						Groove						Supplementary data						Nominal size of pliers per DIN 5254
d1	s	d3		a	b	d5	d2		m		n		d4		FR		FRg		nabl	
Nominal size	per. dev.	per. dev.	max.	approx.	min.	weight kg/1000pcs	per. dev.	H13	t	min.	kN	FN	kN	g	kN	min-1				
125	4		118		11	10.4	4	90	121	0	4.15	2	6	149	129	412	4	56.5	3420	125
130	4		123	0.63	12	10.7	4	100	126	-0.63	4.15	2	6	154	134	2396	4	55.2	3180	
135	4		128	-1.5	12	11	4	104	131	(h13)	4.15	2	6	160	139	390	4	55.4	2950	
140	4		133		12	11.2	4	110	136		4.15	2	6	165	145	377	4	54.4	2760	
145	4		138		12	11.5	4	115	141		4.15	2	6	171	150	367	4	53.8	2600	
150	4		142		13	11.8	4	120	145		4.15	2.5	7.5	177	193	358	4	53.4	2480	
155	4		146		13	12	4	135	150		4.15	2.5	7.5	182	200	353	4	52.6	2710	
160	4		151		13	12.2	4	150	155		4.15	2.5	7.5	188	206	349	4	52.2	2540	
165	4		156		14	12.5	4	160	160		4.15	2.5	7.5	193	213	345	4	41.4	2520	
170	4		161		14	12.9	4	170	165		4.15	2.5	7.5	198	219	349	4	41.9	2440	
175	4		166		14	12.9	4	180	170		4.15	2.5	7.5	203	226	340	5	40.7	2300	
180	4		171		14	13.5	4	190	175		4.15	2.5	7.5	210	232	345	5	41.4	2790	
185	4		176		14	13.5	4	200	180		4.15	2.5	7.5	215	239	337	5	40.4	2070	
190	4		181	0.72	14	14	4	210	185	0	4.15	2.5	7.5	220	245	334	5	40	1970	
195	4		186	-1.7	14	14	4	220	190	-0.72	4.15	2.5	7.5	225	252	325	5	39	1835	
200	4		191		14	14	4	230	195	(h13)	4.15	2.5	7.5	230	258	319	5	38.3	1770	
210	5	0	198		14	14	4	248	204		5.15	3	9	240	325	598	6	59.9	1835	
220	5	-0.12	208		14	14	4	265	214		5.15	3	9	250	341	572	6	57.3	1620	
230	5		218		14	14	4	290	224		5.15	3	9	260	357	549	6	55	1445	
240	5		228		14	14	4	310	234		5.15	3	9	270	373	530	6	53	1305	
250	5		238		14	14	4	335	244		5.15	3	9	280	388	504	6	50.5	1180	
260	5		245		16	16	5	355	252	0	5.15	4	12	294	536	541	6	54.6	1320	
270	5		255	0.81	16	16	5	375	262	-0.81	5.15	4	12	304	557	525	6	52.5	1215	
280	5		265	-2	16	16	5	398	272	(h13)	5.15	4	12	314	577	508	6	50.9	1100	
290	5		275		16	16	5	418	282		5.15	4	12	324	599	491	6	49.2	1005	
300	5		285		16	16	5	440	292		5.15	4	12	334	619	475	6	47.5	930	

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Metric DIN 471 External Retaining Rings (aka circlips) are thin, circular, metal stampings that are used to prevent movement between mating components. These are designed to be assembled axially onto a shaft and to be fit into a groove on the outside of the shaft. They function to reduce vibration and maintain proper position of two parts in an assembly and permit easy disassembly of the components by removing the retaining ring. Aspen Fasteners offers one of the most complete ranges of metric retaining rings and other inch and metric industrial fasteners for immediate delivery from stock. The following sizes of metric DIN 471 Retaining Rings are available for immediate shipping from stock: Diameters ranging from M3 to M120 in A2 stainless steel. View parts by clicking on the following link: [Metric DIN 471 Retaining Rings](#)

DIN (Deutsches Institut für Normung - German Institute for Standardization) standards are issued for a variety of components including industrial fasteners as metric DIN 471 Retaining Rings. The DIN standards remain common in Germany, Europe and globally even though the transition to ISO standards is taking place. DIN standards continue to be used for parts which do not have ISO equivalents or for which there is no need for standardization like DIN 471 Retaining Rings.

1) Mechanical properties of stainless steel for metric DIN 471 Retaining Rings

Stainless steels can be divided into three groups of steel - austenitic, ferritic and martensitic. Austenitic steel is by far the most common type (>90% of commercial fasteners). The steel groups and strength classes are designated by a four-digit sequence of letters and numbers (eg A2-70) as shown in the following table. DIN EN ISO 3506 governs screws and nuts made from stainless steel.

Steel group	Steel grade	Strength class	Screws, Nuts and Bolts			
			Tensile strength N/mm ²	Tensile strength PSI	Dia range	Nut Load N/mm ²
Austenitic	A2 and A4	50	500	70.000	<=M39	500
		70	700	100.000	<=M20	700
		80	800	118.000	<=M20	800

The tensile stress is calculated with reference to the tensile stress area (see DIN EN ISO 3506-1979). Nuts to be paired with same grade of stainless steel screws

Steel group	Property Strength class	Made From	Characteristics
Austenitic	50	A1. A2	Soft; cold worked. turned and soft pressed fasteners
	70	A2. A4	Cold worked. normal strength formed fasteners
	80	A2. A4	Extreme cold worked. high strength. special

2) Chemical composition of stainless steel metric DIN 471 Retaining Rings

Grade	USA Grade	Material designation	Material no.	C %	Si ≤ %	Mn ≤ %	Cr %	Mo %	Ni %
A 2	304	X 5Cr Ni 1810	1.4301	≤ 0.07	1.0	2.0	17.5 to	-	8.0 to
		X 2 Cr Ni 1811	1.4306	≤ 0.03	1.0	2.0	18.0 to	-	1.0 to
		X 8 Cr Ni 19/10	1.4303	≤ 0.07	1.0	2.0	17.0 to	-	11.0 to
A 4	316	X 5 Cr Ni Mo 1712	1.4401	≤ 0.07	1.0	2.0	16.5 to	2.0 to	10.0 to
		X 2 Cr Ni Mo 1712	1.4404	≤ 0.03	1.0	2.0	16.5 to	2.0 to	1.0 to

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3) Chemical composition of steel metric DIN 471 Retaining Rings

PROPERTY CLASS	MATERIAL AND TREATMENT	CHEMICAL COMPOSITION LIMITS %				TEMPERING TEMP °C MIN.
		C		P	S	
		min.	max.	max.	max.	
4.6. 4.8. 5.8. 6.8	Low or medium carbon steel	-	0.55	0.05	0.06	-
8.8	Medium carbon steel quenched. tempered	0.25	0.55	0.04	0.05	425
9.8	Medium carbon steel quenched. tempered	0.25	0.55	0.04	0.05	425
10.9	Medium carbon steel additives e.g. boron. Mn. Cr or Alloy steel - quenched. tempered	0.20	0.55	0.04	0.05	425
12.9	Alloy steel - quenched. tempered	0.20	0.50	0.035	0.035	380

4) Mechanical properties of steel for metric DIN 471 Retaining Rings

MECHANICAL PROPERTY		PROPERTY CLASS									
		4.8	5.6	5.8	6.8	8.8		9.8	10.9	12.9	
						Up to	Over				
Tensile Strength	nom.	400	500		600	800		900	100	120	
	min.	420	500	520	600	800	830	900	104	122	
Vickers Hardness	min.	130	155	160	190	250	255	290	320	385	
	max.	250				320	336	360	380	435	
Brinell Hardness	min.	124	147	152	181	319	242	266	295	353	
	max.	238				385	319	342	363	412	
Rockwell Hardness	min.	71	79	82	89	-					
	HRC	-	-	-	-	20	23	28	32	39	
	HR	95				99	-				
	max.	-	-	-	-	32	34	37	39	44	
Yield Stress ReL	nom.	320	300	400	480	-					
	min.	340	300	420	480	-					
Stress at permanent set	nom.	-				640		720	900	108	
	min.	-				640	660	720	940	110	

Disclaimer

Dimensional data and technical information for metric DIN 471 Retaining Rings was obtained from publicly available sources and not acquired through standards agencies. It has been completed and compiled for reference purposes only; where discrepancies are found they are subject to change without notice. Aspen Fasteners makes no warranties or representations regarding the accuracy and validity of the compiled information and data. Contact the relevant standards authorities for accurate and detailed information.

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