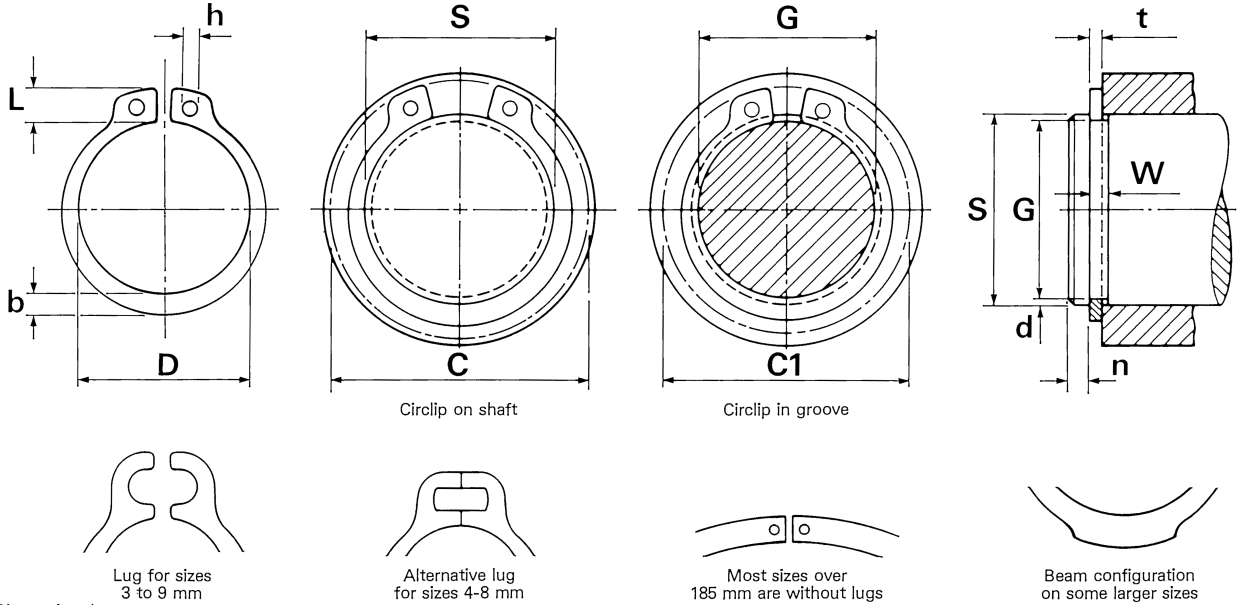


Standard External Circlips Metric Specifications

Standard material - carbon spring steel. Standard finish - phosphate & oil

All dimensions in mm



Sizes printed in blue are preferred sizes

† Thrust load calculations see pages 9 & 10

SIZE CODE	Shaft		Groove (G)					Circlip (F)										Wt. (kg/k)	Tc† (N)	Tg† (N)
	S	G	Tol.	W	Tol.	n (min)	d ~	t	Tol.	D	Tol.	C	C1	L (max)	b ~	h (min)				
0030	3	2.8	+0.00 -0.04	0.50		0.3	0.10	0.40		2.7		7.0	6.6	1.9	0.8	1.0	0.02	1170	110	
0040	4	3.8		0.50		0.3	0.10	0.40		3.7	+0.04	8.6	8.2	2.2	0.9	1.0	0.03	1600	150	
0050	5	4.8	+0.00	0.70		0.3	0.10	0.60	+0.00	4.7	-0.15	10.3	9.8	2.5	1.1	1.0	0.08	2900	190	
0060	6	5.7	-0.048	0.80		0.5	0.15	0.70	-0.05	5.6		11.7	11.1	2.7	1.3	1.2	0.13	4100	340	
0070	7	6.7		0.90		0.5	0.15	0.80		6.5		13.5	12.9	3.1	1.4	1.2	0.18	5500	400	
0080	8	7.6	+0.00	0.90		0.6	0.20	0.80		7.4	+0.06	14.7	14.0	3.2	1.5	1.2	0.20	6200	600	
0090	9	8.6	-0.06	1.10		0.6	0.20	1.00		8.4	-0.18	16.0	15.2	3.3	1.7	1.2	0.32	8800	680	
0100	10	9.6		1.10		0.6	0.20	1.00		9.3		17.0	16.2	3.3	1.8	1.5	0.40	9700	750	
0110	11	10.5		1.10		0.8	0.25	1.00		10.2		18.0	17.1	3.3	1.8	1.5	0.41	10700	1040	
0120	12	11.5		1.10		0.8	0.25	1.00		11.0		19.0	18.1	3.3	1.8	1.7	0.45	11700	1130	
0130	13	12.4		1.10		0.9	0.30	1.00		11.9	+0.10	20.2	19.2	3.4	2.0	1.7	0.52	12700	1470	
0140	14	13.4		1.10		0.9	0.30	1.00		12.9	-0.36	21.4	20.4	3.5	2.1	1.7	0.56	13600	1580	
0150	15	14.3	+0.00	1.10		1.1	0.35	1.00		13.8		22.6	21.5	3.6	2.2	1.7	0.62	14600	1980	
0160	16	15.2	-0.11	1.10		1.2	0.40	1.00		14.7		23.8	22.6	3.7	2.2	1.7	0.69	15600	2410	
0170	17	16.2		1.10		1.2	0.40	1.00		15.7		25.0	23.8	3.8	2.3	1.7	0.77	16600	2560	
0180	18	17.0		1.30		1.5	0.50	1.20		16.5		26.2	24.8	3.9	2.4	2.0	0.99	21000	3390	
0190	19	18.0		1.30		1.5	0.50	1.20		17.5		27.2	25.8	3.9	2.5	2.0	1.10	22200	3580	
0200	20	19.0		1.30		1.5	0.50	1.20		18.5		28.4	27.0	4.0	2.6	2.0	1.18	23400	3770	
0210	21	20.0	+0.00	1.30		1.5	0.50	1.20		19.5	+0.13	29.6	28.2	4.1	2.7	2.0	1.26	24500	3960	
0220	22	21.0	-0.13	1.30		1.5	0.50	1.20		20.5	-0.42	30.8	29.4	4.2	2.8	2.0	1.39	25700	4150	
0230	23	22.0		1.30		1.5	0.50	1.20	+0.00	21.5		32.0	30.6	4.3	2.9	2.0	1.54	26900	4340	
0240	24	22.9		1.30		1.7	0.55	1.20	-0.06	22.2		33.2	31.7	4.4	3.0	2.0	1.52	28000	4980	
0250	25	23.9		1.30		1.7	0.55	1.20		23.2		34.2	32.7	4.4	3.0	2.0	1.70	29200	5180	
0260	26	24.9	+0.00	1.30		1.7	0.55	1.20		24.2		35.5	33.9	4.5	3.1	2.0	1.75	30400	5390	
0270	27	25.6	-0.21	1.30	+0.14 -0.00	2.1	0.70	1.20		24.9	+0.21	36.7	34.8	4.6	3.1	2.0	1.89	31600	7130	
0280	28	26.6		1.60		2.1	0.70	1.50		25.9	-0.42	37.9	36.0	4.7	3.2	2.0	2.47	40900	7390	
0290	29	27.6		1.60		2.1	0.70	1.50		26.9		39.1	37.2	4.8	3.4	2.0	2.75	42400	7650	
0300	30	28.6		1.60		2.1	0.70	1.50		27.9		40.5	38.6	5.0	3.5	2.0	2.93	43800	7920	
0320	32	30.3		1.60		2.6	0.85	1.50		29.6		43.0	40.7	5.2	3.6	2.5	3.02	46700	10300	
0330	33	31.3		1.60		2.6	0.85	1.50		30.5		44.0	41.7	5.2	3.7	2.5	3.30	48200	10600	
0340	34	32.3		1.60		2.6	0.85	1.50		31.5	+0.25	45.4	43.1	5.4	3.8	2.5	3.72	49700	10900	
0350	35	33.0		1.60		3.0	1.00	1.50		32.2	-0.50	46.8	44.2	5.6	3.9	2.5	3.78	51100	13200	
0360	36	34.0		1.85		3.0	1.00	1.75		33.2		47.8	45.2	5.6	4.0	2.5	4.55	51400	13600	
0380	38	36.0		1.85		3.0	1.00	1.75		35.2		50.2	47.6	5.8	4.2	2.5	5.08	54800	14300	
0400	40	37.5	+0.00	1.85		3.8	1.25	1.75		36.5		52.6	49.5	6.0	5.0	2.5	5.54	56600	18800	
0420	42	39.5	-0.25	1.85		3.8	1.25	1.75		38.5		55.7	52.5	6.5	5.0	2.5	5.99	59500	19800	
0450	45	42.5		1.85		3.8	1.25	1.75		41.5	+0.39	59.1	55.9	6.7	5.0	2.5	6.75	63700	21200	
0460	46	43.5		1.85		3.8	1.25	1.75		42.5	-0.90	60.1	56.9	6.7	5.0	2.5	7.24	65100	21700	
0470	47	44.5		1.85		3.8	1.25	1.75		43.5		61.3	58.1	6.8	5.0	2.5	7.30	66500	22100	
0480	48	45.5		1.85		3.8	1.25	1.75		44.5		62.5	59.3	6.9	5.0	2.5	7.51	67900	22600	
0500	50	47.0		2.15		4.5	1.50	2.00		45.8		64.5	60.8	6.9	5.5	2.5	9.88	80900	28300	
0520	52	49.0		2.15		4.5	1.50	2.00		47.8	+0.46	66.7	63.0	7.0	5.5	2.5	9.53	84100	29400	
0540	54	51.0		2.15		4.5	1.50	2.00		49.8	-1.10	69.0	65.2	7.1	5.5	2.5	10.30	87400	30500	
0550	55	52.0		2.15		4.5	1.50	2.00		50.8		70.2	66.4	7.2	5.5	2.5	10.41	89000	31100	
0560	56	53.0	+0.00	2.15		4.5	1.50	2.00	+0.00	51.8		71.6	67.6	7.3	5.5	2.5	10.50	90600	31700	
0580	58	55.0	-0.30	2.15		4.5	1.50	2.00	-0.07	53.8		73.6	69.6	7.3	5.6	2.5	12.47	93800	32800	
0600	60	57.0		2.15		4.5	1.50	2.00		55.8		75.6	71.8	7.4	5.8	2.5	13.69	97100	33900	
0620	62	59.0		2.15		4.5	1.50	2.00		57.8		77.8	74.0	7.5	6.0	2.5	12.36	100000	35100	
0630	63	60.0		2.15		4.5	1.50	2.00		58.8		79.0	75.2	7.6	6.2	2.5	13.10	102000	35600	
0650	65	62.0		2.65		4.5	1.50	2.50		60.8		81.4	77.6	7.8	6.3	3.0	20.44	131000	36800	

Standard material - carbon spring steel. Standard finish - phosphate and oil.

Standard External Circlips Metric Specifications

Standard material - carbon spring steel. Standard finish - phosphate & oil

SIZE CODE	Shaft		Groove (G)					Circlip (F)								Wt. (kg/k)	Tc† (N)	Tg† (N)	
	S	G	Tol.	W	Tol.	n (min)	d ~	t	Tol.	D	Tol.	C	C1	L (max)	b ~				h (min)
0670	67	64.0		2.65		4.5	1.50	2.50		62.5		83.6	79.8	7.9	6.4	3.0	20.43	135000	37900
0680	68	65.0		2.65		4.5	1.50	2.50		63.5		84.4	81.0	8.0	6.5	3.0	19.55	138000	38500
0700	70	67.0		2.65		4.5	1.50	2.50		65.5		87.0	83.2	8.1	6.6	3.0	22.13	142000	39600
0720	72	69.0	+0.00	2.65	+0.14	4.5	1.50	2.50	+0.00	67.5		89.2	85.4	8.2	6.8	3.0	21.60	146000	40700
0750	75	72.0	-0.30	2.65	-0.00	4.5	1.50	2.50	-0.07	70.5	+0.46	92.7	88.8	8.4	7.0	3.0	24.65	152000	42400
0770	77	74.0		2.65		4.5	1.50	2.50		72.5	-1.10	94.9	91.0	8.5	7.2	3.0	24.26	156000	43500
0780	78	75.0		2.65		4.5	1.50	2.50		73.5		96.1	92.2	8.6	7.3	3.0	28.10	158000	44100
0800	80	76.5		2.65		5.3	1.75	2.50		74.5		98.1	93.7	8.6	7.4	3.0	26.68	162000	52800
0820	82	78.5		2.65		5.3	1.75	2.50		76.5		100.3	95.9	8.7	7.6	3.0	28.35	166000	54100
0850	85	81.5		3.15		5.3	1.75	3.00		79.5		103.3	98.9	8.7	7.8	3.5	35.40	206000	56100
0880	88	84.5	+0.00	3.15		5.3	1.75	3.00	+0.00	82.5		106.5	102.0	8.8	8.0	3.5	39.85	214000	58100
0900	90	86.5	-0.35	3.15		5.3	1.75	3.00	-0.08	84.5		108.5	104.0	8.8	8.2	3.5	38.89	218000	59400
0950	95	91.5		3.15		5.3	1.75	3.00		89.5		114.8	111.0	9.4	8.6	3.5	42.39	231000	62700
0980	98	94.5		3.15		5.3	1.75	3.00		91.5		118.6	114.0	9.8	9.0	3.5	54.00	238000	64700
1000	100	96.5		3.15		5.3	1.75	3.00		94.5		120.2	116.0	9.6	9.0	3.5	48.86	243000	66000
1020	102	98.0		4.15		6.0	2.00	4.00		95.0	+0.54	122.4	118.0	9.7	9.2	3.5	68.73	330000	76900
1050	105	101.0		4.15		6.0	2.00	4.00		98.0	-1.30	126.2	122.0	10.1	9.3	3.5	73.16	340000	79200
1080	108	104.0	+0.00	4.15		6.0	2.00	4.00		100.0		129.0	124.0	10.0	9.5	3.5	83.45	349000	81400
1100	110	106.0	-0.54	4.15		6.0	2.00	4.00		103.0		131.2	127.0	10.1	9.6	3.5	75.24	356000	82900
1150	115	111.0		4.15		6.0	2.00	4.00		108.0		137.3	133.0	10.6	9.8	3.5	78.65	327000	86700
1200	120	116.0		4.15		6.0	2.00	4.00		113.0		143.1	138.0	11.0	10.2	3.5	85.58	388000	90500
1250	125	121.0		4.15		6.0	2.00	4.00		118.0		149.0	144.0	11.4	10.4	4.0	99.62	404000	94200
1300	130	126.0		4.15		6.0	2.00	4.00		123.0		154.4	150.0	11.6	10.7	4.0	98.10	421000	98000
1350	135	131.0		4.15		6.0	2.00	4.00		128.0		159.8	155.0	11.8	11.0	4.0	113.40	437000	102000
1400	140	136.0		4.15		6.0	2.00	4.00	+0.00	133.0		165.2	160.0	12.0	11.2	4.0	119.18	453000	106000
1450	145	141.0		4.15		6.0	2.00	4.00	-0.10	138.0		170.6	166.0	12.2	11.5	4.0	128.53	470000	109000
1500	150	145.0	+0.00	4.15	+0.18	7.5	2.50	4.00	-0.00	142.0		177.3	171.0	13.0	11.8	4.0	132.80	485000	114000
1550	155	150.0	-0.63	4.15	-0.00	7.5	2.50	4.00		146.0	+0.63	182.3	176.0	13.0	12.0	4.0	136.06	501000	146000
1600	160	155.0		4.15		7.5	2.50	4.00		151.0	-1.50	188.0	182.0	13.3	12.2	4.0	137.50	518000	151000
1650	165	160.0		4.15		7.5	2.50	4.00		155.5		193.4	187.0	13.5	12.5	4.0	151.96	534000	156000
1700	170	165.0		4.15		7.5	2.50	4.00		160.5		198.4	192.0	13.5	12.9	4.0	169.00	550000	160000
1750	175	170.0		4.15		7.5	2.50	4.00		165.5		203.4	197.0	13.5	12.9	4.0	173.70	566000	165000
1800	180	175.0		4.15		7.5	2.50	4.00		170.5		210.0	204.0	14.2	13.5	4.0	188.00	582000	170000
1850	185	180.0		4.15		7.5	2.50	4.00		175.5		215.2	209.0	14.3	13.5	4.0	193.00	598000	174000
1900	190	185.0		4.15		7.5	2.50	4.00		180.5		220.0	214.0	14.2	14.0	4.0	203.00	615000	179000
1950	195	190.0		4.15		7.5	2.50	4.00		185.5		225.0	219.0	14.2	14.0	4.0	209.50	631000	184000
2000	200	195.0		4.15		7.5	2.50	4.00		190.5		230.0	224.0	14.2	14.0	4.0	214.00	647000	188000
2050	205	199.0	+0.00	5.15	-0.72	9.0	3.00	5.00		193.0		235.0	228.0	14.2	14.0	4.0	278.00	721000	232000
2100	210	204.0		5.15		9.0	3.00	5.00		198.0	+0.72	240.0	233.0	14.2	14.0	4.0	285.00	739000	238000
2200	220	214.0		5.15		9.0	3.00	5.00		208.0	-1.70	250.0	243.0	14.2	14.0	4.0	298.50	775000	249000
2300	230	224.0		5.15		9.0	3.00	5.00	+0.00	218.0		260.0	253.0	14.2	14.0	4.0	312.00	809000	260000
2400	240	234.0		5.15		9.0	3.00	5.00	-0.12	228.0		270.0	263.0	14.2	14.0	4.0	326.00	844000	271000
2500	250	244.0		5.15		9.0	3.00	5.00		238.0		280.0	272.0	14.2	14.0	4.0	340.00	880000	283000
2600	260	252.0		5.15		12.0	4.00	5.00		245.0		294.0	285.0	16.2	16.0	5.0	414.00	915000	392000
2700	270	262.0		5.15		12.0	4.00	5.00		255.0		304.0	295.0	16.2	16.0	5.0	430.50	950000	407000
2800	280	272.0	+0.00	5.15	-0.81	12.0	4.00	5.00		265.0	+0.81	314.0	305.0	16.2	16.0	5.0	446.50	985000	422000
2900	290	282.0		5.15		12.0	4.00	5.00		275.0	-2.00	324.0	315.0	16.2	16.0	5.0	463.00	1020000	437000
3000	300	292.0		5.15		12.0	4.00	5.00		285.0		334.0	325.0	16.2	16.0	5.0	479.00	1056000	452000
3100	310	300.0		6.20		15.0	5.00	6.00		293.0		352.2	341.0	20.2	20.0	6.0	710.50	1309000	584000
3200	320	310.0		6.20		15.0	5.00	6.00		303.0		362.2	351.0	20.2	20.0	6.0	734.00	1351000	603000
3300	330	320.0		6.20		15.0	5.00	6.00		313.0		372.2	361.0	20.2	20.0	6.0	757.00	1393000	622000
3400	340	330.0		6.20		15.0	5.00	6.00		323.0		382.2	371.0	20.2	20.0	6.0	780.00	1436000	641000
3500	350	340.0		6.20		15.0	5.00	6.00		333.0	+1.00	392.2	381.0	20.2	20.0	6.0	805.00	1478000	660000
3600	360	350.0	+0.00	6.20	-0.00	15.0	5.00	6.00	-0.18	343.0	-2.50	402.2	391.0	20.2	20.0	6.0	827.00	1520000	679000
3700	370	360.0	-0.89	6.20		15.0	5.00	6.00		353.0		412.2	401.0	20.2	20.0	6.0	850.00	1562000	697000
3800	380	370.0		6.20		15.0	5.00	6.00		363.0		422.2	411.0	20.2	20.0	6.0	873.00	1604000	716000
3900	390	380.0		6.20		15.0	5.00	6.00		373.0		432.2	421.0	20.2	20.0	6.0	896.00	1646000	735000
4000	400	390.0		6.20		15.0	5.00	6.00		383.0		442.2	431.0	20.2	20.0	6.0	919.00	1689000	754000