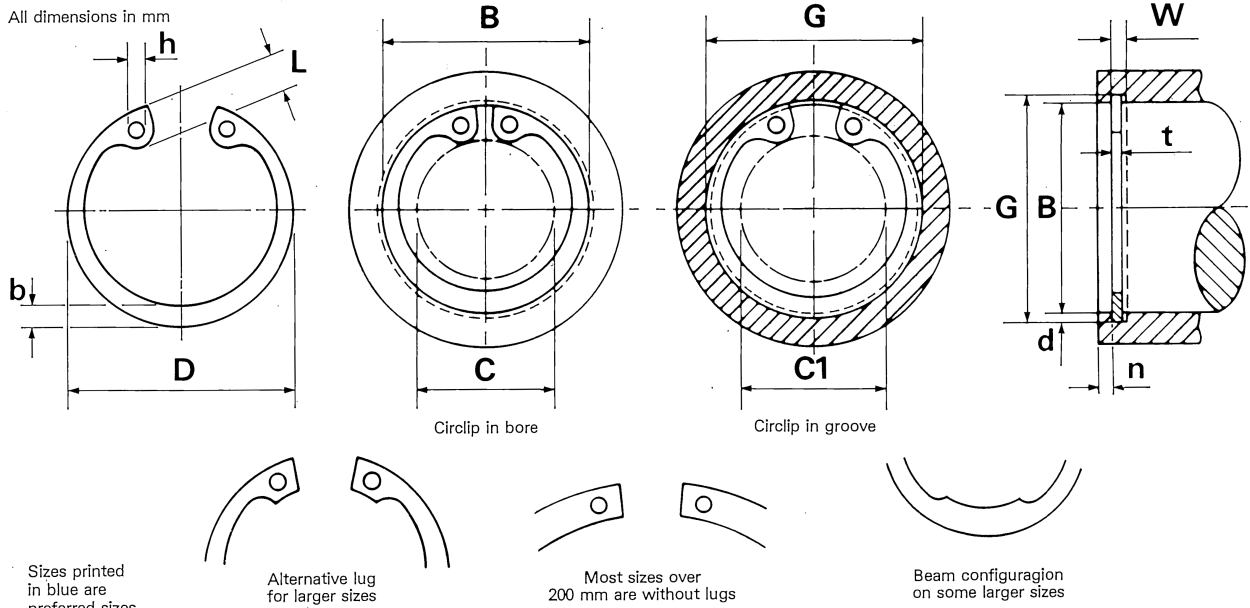


# Standard Internal Circlips Metric Specifications

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



Sizes printed in blue are preferred sizes

Alternative lug for larger sizes

Most sizes over 200 mm are without lugs

Beam configuration on some larger sizes

† Thrust load calculations see pages 9 & 10

SIZE CODE	Bore		Groove (G)				Circlip (F)										Wt. (kg/k)	Tc† (N)	Tg† (N)
	B	G	Tol.	W	Tol.	n (min)	d	t	Tol.	D	Tol.	C	C1	L (max)	b	h (min)			
0080	8	8.4		0.90		0.6	0.2	0.80	+0.00	8.7		3.0	3.6	2.4	1.1	1.0	0.11	6200	600
0090	9	9.4	+0.09	0.90		0.6	0.2	0.80	-0.05	9.8		3.7	4.4	2.5	1.3	1.0	0.17	7000	680
0095	9.5	9.9		1.10		0.6	0.2	1.00		10.3		3.2	3.9	3.0	1.3	1.2	0.22	9300	720
0100	10	10.4		1.10		0.6	0.2	1.00		10.8		3.3	4.0	3.2	1.4	1.2	0.24	9700	750
0110	11	11.4		1.10		0.6	0.2	1.00		11.8	+0.36	4.1	4.8	3.3	1.5	1.2	0.30	10700	830
0120	12	12.5		1.10		0.8	0.3	1.00		13.0	-0.10	4.9	5.7	3.4	1.7	1.5	0.34	11700	1130
0130	13	13.6	+0.11	1.10		0.9	0.3	1.00		14.1		5.4	6.4	3.6	1.8	1.5	0.39	12700	1470
0140	14	14.6	-0.00	1.10		0.9	0.3	1.00		15.1		6.2	7.2	3.7	1.9	1.7	0.45	13600	1580
0150	15	15.7		1.10		1.1	0.4	1.00		16.2		7.2	8.3	3.7	2.0	1.7	0.48	14600	1980
0160	16	16.8		1.10		1.2	0.4	1.00		17.3		8.0	9.2	3.8	2.0	1.7	0.54	15600	2410
0170	17	17.8		1.10		1.2	0.4	1.00		18.3		8.8	10.0	3.9	2.1	1.7	0.59	16600	2560
0180	18	19.0		1.10		1.5	0.5	1.00		19.5		9.4	10.8	4.1	2.2	2.0	0.61	17500	3390
0190	19	20.0	+0.13	1.10		1.5	0.5	1.00		20.5	+0.42	10.4	11.8	4.1	2.2	2.0	0.72	18500	3580
0200	20	21.0	-0.00	1.10		1.5	0.5	1.00		21.5	-0.13	11.2	12.6	4.2	2.3	2.0	0.75	19500	3770
0210	21	22.0		1.10		1.5	0.5	1.00		22.5		12.2	13.6	4.2	2.4	2.0	0.84	20400	3960
0220	22	23.0		1.10		1.5	0.5	1.00		23.5		13.2	14.6	4.2	2.5	2.0	0.86	21400	4150
0230	23	24.1		1.30		1.7	0.6	1.20		24.6		14.2	15.7	4.2	2.5	2.0	1.20	26900	4770
0240	24	25.2		1.30		1.8	0.6	1.20		25.9	+0.42	14.8	16.4	4.4	2.6	2.0	1.21	28000	5430
0250	25	26.2	+0.21	1.30		1.8	0.6	1.20		26.9	-0.21	15.5	17.2	4.5	2.7	2.0	1.33	29200	5650
0260	26	27.2	-0.00	1.30		1.8	0.6	1.20	+0.00	27.9		16.1	17.8	4.7	2.8	2.0	1.35	30400	5880
0270	27	28.4		1.30		2.1	0.7	1.20	-0.06	29.1		17.1	19.0	4.7	2.9	2.0	1.55	31600	7130
0280	28	29.4		1.30		2.1	0.7	1.20		30.1		17.9	19.8	4.8	2.9	2.0	1.64	32700	7390
0290	29	30.4		1.30		2.1	0.7	1.20		31.1		18.9	20.8	4.8	3.0	2.0	1.74	33900	7650
0300	30	31.4		1.30		2.1	0.7	1.20		32.1		19.9	21.8	4.8	3.0	2.0	1.87	35100	7920
0310	31	32.7		1.30	+0.14	2.6	0.9	1.20		33.4		20.0	22.3	5.2	3.2	2.5	2.20	36200	9930
0320	32	33.7		1.30	-0.00	2.6	0.9	1.20		34.4	+0.50	20.6	22.9	5.4	3.2	2.5	1.98	37400	10300
0330	33	34.7		1.30		2.6	0.9	1.20		35.5	-0.25	21.6	23.9	5.4	3.3	2.5	2.13	36800	10600
0340	34	35.7		1.60		2.6	0.9	1.50		36.5		22.6	24.9	5.4	3.3	2.5	2.88	49700	10900
0350	35	37.0		1.60		3.0	1.0	1.50		37.8		23.6	26.2	5.4	3.4	2.5	2.93	51100	13200
0360	36	38.0	+0.25	1.60		3.0	1.0	1.50		38.8		24.6	27.2	5.4	4.0	2.5	3.23	52600	13600
0370	37	39.0	-0.00	1.60		3.0	1.0	1.50		39.8		25.4	28.0	5.5	3.2	2.5	2.98	54100	13900
0380	38	40.0		1.60		3.0	1.0	1.50		40.8		26.4	29.0	5.5	3.7	2.5	3.54	55500	14300
0400	40	42.5		1.85		3.8	1.3	1.75		43.5		27.8	30.9	5.8	3.9	2.5	4.63	56600	18800
0410	41	43.5		1.85		3.8	1.3	1.75		44.5		28.6	31.7	5.9	4.0	2.5	5.37	58000	19300
0420	42	44.5		1.85		3.8	1.3	1.75		45.5	+0.90	29.6	32.7	5.9	4.1	2.5	5.21	59500	19800
0450	45	47.5		1.85		3.8	1.3	1.75		48.5	-0.39	32.0	35.1	6.2	4.3	2.5	5.88	63700	21200
0470	47	49.5		1.85		3.8	1.3	1.75		50.5		33.5	36.7	6.4	4.4	2.5	6.13	66500	22100
0480	48	50.5		1.85		3.8	1.3	1.75		51.5		34.5	37.7	6.4	4.5	2.5	6.31	68000	22600
0500	50	53.0		2.15		4.5	1.5	2.00		54.2		36.3	40.0	6.5	4.6	2.5	8.01	80900	28300
0510	51	54.0		2.15		4.5	1.5	2.00		55.2		37.3	41.0	6.5	4.7	2.5	8.72	82500	28800
0520	52	55.0		2.15		4.5	1.5	2.00		56.2		37.9	41.6	6.7	4.7	2.5	8.91	84100	29400
0550	55	58.0		2.15		4.5	1.5	2.00		59.2		40.7	44.4	6.8	5.0	2.5	9.44	89000	31100
0560	56	59.0		2.15		4.5	1.5	2.00		60.2		41.7	45.4	6.8	5.1	2.5	9.75	90600	31700
0570	57	60.0	+0.30	2.15		4.5	1.5	2.00	+0.00	62.2	+1.10	42.7	46.4	6.8	5.1	2.5	9.56	92200	32200
0580	58	61.0	-0.00	2.15		4.5	1.5	2.00	-0.07	62.2	-0.46	43.5	47.2	6.9	5.2	2.5	10.36	93800	32800
0600	60	63.0		2.15		4.5	1.5	2.00		64.2		44.7	48.4	7.3	5.4	2.5	11.15	97100	33900
0620	62	65.0		2.15		4.5	1.5	2.00		66.2		46.7	50.4	7.3	5.5	2.5	11.59	100000	35100
0630	63	66.0		2.15		4.5	1.5	2.00		67.2		47.7	51.4	7.3	5.6	2.5	11.78	102000	35600
0640	64	67.0		2.15		4.5	1.5	2.00		68.2		48.7	52.4	7.3	5.2	2.5	16.80	104000	36200
0650	65	68.0		2.65		4.5	1.5	2.50		69.2		49.0	52.8	7.6	5.8	3.0	17.71	131000	36800

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

# Standard Internal Circlips Metric Specifications Standard

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

SIZE CODE	Bore		Groove (G)						Circlip (F)								Wt. (kg/k)	Tc† (N)	Tg† (N)
	B	G	Tol.	W	Tol.	n (min)	d ~	t	Tol.	D	Tol.	C	C1	L (max)	b ~	h (min)			
0670	67	70.0	+0.30 -0.00	2.65	+0.14 -0.00	4.5	1.5	2.50	+0.00 -0.07	72.5	+1.10 -0.46	50.8	54.6	7.7	6.0	3.0	17.71	136000	37900
0680	68	71.0		2.65		4.5	1.5	2.50		72.5		51.6	55.4	7.8	6.1	3.0	17.72	138000	38500
0700	70	73.0		2.65		4.5	1.5	2.50		74.5		53.6	57.4	7.8	6.2	3.0	17.65	142000	39600
0720	72	75.0		2.65		4.5	1.5	2.50		76.5		55.6	59.4	7.8	6.4	3.0	19.70	146000	40700
0750	75	78.0		2.65		4.5	1.5	2.50		79.5		58.6	62.4	7.8	6.6	3.0	20.62	152000	42400
0760	76	79.0	+0.35 -0.00	2.65	+0.14 -0.00	4.5	1.5	2.50	+0.00 -0.08	80.7	+1.30 -0.54	59.6	63.4	7.8	6.1	3.0	22.68	154000	43000
0780	78	81.0		2.65		4.5	1.5	2.50		82.5		60.1	64.0	8.5	6.8	3.0	22.46	158000	44100
0800	80	83.5		2.65		5.3	1.8	2.50		85.5		62.1	66.5	8.5	7.0	3.0	21.38	162000	52800
0820	82	85.5		2.65		5.3	1.8	2.50		87.5		64.1	68.5	8.5	7.2	3.0	22.27	166000	54100
0850	85	88.5		3.15		5.3	1.8	3.00		90.5		66.9	71.3	8.6	7.2	3.5	31.78	206000	56100
0880	88	91.5	+0.35 -0.00	3.15	+0.14 -0.00	5.3	1.8	3.00	+0.00 -0.08	93.5	+1.30 -0.54	69.9	74.3	8.6	7.4	3.5	32.94	214000	58100
0900	90	93.5		3.15		5.3	1.8	3.00		95.5		71.9	76.3	8.6	7.6	3.5	33.35	218000	59400
0920	92	95.5		3.15		5.3	1.8	3.00		97.5		73.7	78.1	8.7	7.8	3.5	35.72	223000	60700
0950	95	98.5		3.15		5.3	1.8	3.00		100.5		76.5	80.9	8.8	8.1	3.5	38.88	231000	62700
0980	98	101.5		3.15		5.3	1.8	3.00		103.5		79.0	83.5	9.0	8.3	3.5	42.16	238000	64700
1000	100	103.5	+0.54 -0.00	3.15	+0.14 -0.00	5.3	1.8	3.00	+0.00 -0.10	105.5	+1.50 -0.63	80.6	85.1	9.2	8.4	3.5	43.41	243000	66000
1020	102	106.0		4.15		6.0	2.0	4.00		108.0		82.0	87.0	9.5	8.5	3.5	55.20	330000	76900
1050	105	109.0		4.15		6.0	2.0	4.00		112.0		85.0	90.0	9.5	8.7	3.5	59.20	340000	79200
1080	108	112.0		4.15		6.0	2.0	4.00		115.0		88.0	93.0	9.5	8.9	3.5	62.60	350000	81400
1100	110	114.0		4.15		6.0	2.0	4.00		117.0		88.2	93.2	10.4	9.0	3.5	71.75	350000	82900
1120	112	116.0	+0.63 -0.00	4.15	+0.18 -0.00	6.0	2.0	4.00	+0.00 -0.10	119.0	+1.50 -0.63	90.0	95.0	10.5	9.1	3.5	70.68	362000	84400
1150	115	119.0		4.15		6.0	2.0	4.00		122.0		93.0	98.0	10.5	9.3	3.5	73.16	372000	86700
1200	120	124.0		4.15		6.0	2.0	4.00		127.0		96.9	102.0	11.0	9.7	3.5	80.40	388000	90500
1250	125	129.0		4.15		6.0	2.0	4.00		132.0		101.9	107.0	11.0	10.0	4.0	81.20	405000	94300
1270	127	131.0		4.15		6.0	2.0	4.00		135.0		103.9	109.0	11.0	10.0	4.0	80.80	411000	95800
1300	130	134.0	+0.63 -0.00	4.15	+0.18 -0.00	6.0	2.0	4.00	+0.00 -0.10	137.0	+1.50 -0.63	106.9	112.0	11.0	10.2	4.0	85.13	421000	98000
1350	135	139.0		4.15		6.0	2.0	4.00		142.0		111.5	116.0	11.2	10.5	4.0	94.79	437000	102000
1400	140	144.0		4.15		6.0	2.0	4.00		147.0		116.5	121.0	11.2	10.7	4.0	98.61	453000	106000
1450	145	149.0		4.15		6.0	2.0	4.00		152.0		121.0	126.0	11.4	10.9	4.0	106.50	469000	109000
1500	150	155.0		4.15		7.5	2.5	4.00		158.0		124.8	131.0	12.0	11.2	4.0	106.80	485000	141000
1550	155	160.0	+0.72 -0.00	4.15	+0.18 -0.00	7.5	2.5	4.00	+0.00 -0.12	164.0	+1.70 -0.72	129.8	136.0	12.0	11.4	4.0	128.00	502000	146000
1600	160	165.0		4.15		7.5	2.5	4.00		169.0		132.7	139.0	13.0	11.6	4.0	130.50	518000	150000
1650	165	170.0		4.15		7.5	2.5	4.00		174.5		137.7	144.0	13.0	11.8	4.0	132.00	534000	156000
1700	170	175.0		4.15		7.5	2.5	4.00		179.5		141.6	148.0	13.5	12.0	4.0	149.50	550000	160000
1750	175	180.0		4.15		7.5	2.5	4.00		184.5		146.6	153.0	13.5	12.0	4.0	158.50	566000	165000
1800	180	185.0	+0.72 -0.00	4.15	+0.18 -0.00	7.5	2.5	4.00	+0.00 -0.12	189.5	+1.70 -0.72	150.2	156.0	14.2	13.0	4.0	168.00	583000	170000
1850	185	190.0		4.15		7.5	2.5	4.00		194.5		155.2	161.0	14.2	13.0	4.0	177.50	599000	174000
1900	190	195.0		4.15		7.5	2.5	4.00		199.5		160.2	166.0	14.3	13.0	4.0	184.00	615000	179000
1950	195	200.0		4.15		7.5	2.5	4.00		204.5		165.2	171.0	14.2	13.0	4.0	189.60	631000	184000
2000	200	205.0		4.15		7.5	2.5	4.00		209.5		170.2	176.0	14.3	13.0	4.0	196.00	647000	188000
2100	210	216.0	+0.72 -0.00	5.15	+0.22 -0.00	9.0	3.0	5.00	+0.00 -0.12	222.0	+2.50 -1.00	180.2	187.0	14.2	14.0	4.0	263.00	739000	237000
2200	220	226.0		5.15		9.0	3.0	5.00		232.0		190.2	197.0	14.2	14.0	4.0	276.00	774000	249000
2300	230	236.0		5.15		9.0	3.0	5.00		242.0		200.2	207.0	14.2	14.0	4.0	291.00	809000	260000
2400	240	246.0		5.15		9.0	3.0	5.00		252.0		210.2	217.0	14.2	14.0	4.0	304.00	845000	271000
2500	250	256.0		5.15		9.0	3.0	5.00		262.0		220.2	227.0	14.2	14.0	4.0	318.50	880000	283000
2600	260	268.0	+0.81 -0.00	5.15	+0.22 -0.00	12.0	4.0	5.00	+0.00 -0.12	275.0	+2.00 -0.81	226.0	235.0	16.2	16.0	5.0	385.00	915000	392000
2700	270	278.0		5.15		12.0	4.0	5.00		285.0		236.0	245.0	16.2	16.0	5.0	401.50	950000	407000
2800	280	288.0		5.15		12.0	4.0	5.00		295.0		246.0	255.0	16.2	16.0	5.0	417.50	985000	422000
2900	290	298.0		5.15		12.0	4.0	5.00		305.0		256.0	265.0	16.2	16.0	5.0	433.40	1020000	437000
3000	300	308.0		5.15		12.0	4.0	5.00		315.0		266.0	275.0	16.2	16.0	5.0	446.00	1060000	452000
3100	310	320.0	+0.89 -0.00	6.20	+0.22 -0.00	15.0	5.0	6.00	+0.00 -0.18	327.0	+2.50 -1.00	267.8	279.0	20.2	20.0	6.0	658.50	1310000	584000
3200	320	330.0		6.20		15.0	5.0	6.00		337.0		277.8	289.0	20.2	20.0	6.0	682.00	1350000	603000
3300	330	340.0		6.20		15.0	5.0	6.00		347.0		287.8	299.0	20.2	20.0	6.0	705.00	1390000	622000
3400	340	350.0		6.20		15.0	5.0	6.00		357.0		297.8	309.0	20.2	20.0	6.0	729.00	1440000	641000
3500	350	360.0		6.20		15.0	5.0	6.00		367.0		307.8	319.0	20.2	20.0	6.0	752.50	1480000	660000
3600	360	370.0	+0.89 -0.00	6.20	+0.22 -0.00	15.0	5.0	6.00	+0.00 -0.18	377.0	+2.50 -1.00	317.8	329.0	20.2	20.0	6.0	769.00	1520000	679000
3700	370	380.0		6.20		15.0	5.0	6.00		387.0		327.8	339.0	20.2	20.0	6.0	793.00	1560000	697000
3800	380	390.0		6.20		15.0	5.0	6.00		397.0		337.8	349.0	20.2	20.0	6.0	817.00	1610000	716000
3900	390	400.0		6.20		15.0	5.0	6.00		407.0		347.8	359.0	20.2	20.0	6.0	838.50	1650000	735000
4000	400	410.0		6.20		15.0	5.0	6.00		417.0		357.8	369.0	20.2	20.0	6.0	862.50	1690000	754000

### Reference to table headings

- A = Free gap
- a = Radial depth
- B = Bore diameter
- b = Beam dimension
- C = Clearance on shaft or in bore
- C1= Clearance in groove
- D = Free diameter (working)
- D1= Free diameter (non functional)
- d = Groove depth
- E = End of play take-up
- F = Circlip details
- G = Groove diameter
- H = Height
- h = Hole diameter
- L = Lug depth
- n = Edge margin
- n1= Shaft or bore face to retained face
- r = radius
- S = Shaft diameter
- Tc= Thrust load for circlip
- Tg= Thrust load of groove
- W = Groove width
- w = Wing dimention
- Wt= Weight
- X = Outer groove wall to retained face
- t = thickness

### Abbreviations used

- B.S. = British Standards
- dec. = Decimal
- frac. = Fraction
- kg/k = kilograms per thousand
- lb.f = Pounds force
- lb/k = Pounds per thousand
- max. = Maximum
- N = Newton
- Nom. = Nominal
- Tol. = Tolerance