O-rings

Quality

Delivery quality

The following delivery quality applies to all standard O-rings for which no other special arrangement has been made:

tolerances according to DIN ISO 3601-1 class B (former DIN 3771-1)

form and surface deviations according to DIN ISO 3601-3 type feature N (former DIN 3771-4 type feature N)

acceptable quality level DIN ISO 2859-1 AQL 1.5

Internal diameter XXL

Many applications of large O-rings are faced with the question of whether O-rings of the required sizes are available, how much they cost and also how they are manufactured.

In addition to the traditional O-rings produced by endless molding, round cord rings of butt-glued or butt-vulcanized round cords are avbailable. The drawbacks of these versions include the distinctly higher cord thickness tolerances and the lower stress bearing capacity of the glued joint. Mold-made O-rings do not have these drawbacks but are substantially more expensive due to the large size of the molds and the need for large presses.

A special manufacturing method with special mold design now enables us to make large O-rings (of 700mm O.D. and larger) as another alternative at a very attractive price.

These O-rings are also made by endless molding. The only difference to the traditional O-ring is the outer shape in the uncompressed state, which is not ideally round. When the ring is slightly expanded when fitted, that deviation disappears.
With this development, we can offer you the advantages of endless molded O-rings at distinctly better prices.

Tolerances

Inner diameter tolerances

according to DIN ISO 3601-1 class B (former DIN 3771-1)

The inner diameter tolerances in the table below were calculated using the formula according to DIN ISO 3601-1:

$\Delta d1 = \pm [(d10{,}95 \times 0{,}009) + 0{,}11]$

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Inner diameter d_1 [mm]					Tolerance Δd_1 [mm]	
		d_1	≤	0.53	±	0.11
0.53	<	d_1	≤	1.71	±	0.12
1.71	<	d_1	≤	2.93	±	0.13
2.93	<	d_1	≤	4.17	±	0.14
4.17	<	d_1	≤	5.44	±	0.15
5.44	<	d_1	≤	6.72	±	0.16
6.72	<	d_1	≤	8.01	±	0.17
8.01	<	d_1	≤	9.31	±	0.18
9.31	<	d_1	≤	10.62	±	0.19
10.62	<	d_1	≤	11.94	±	0.20
11.94	<	d_1	≤	13.27	±	0.21
13.27	<	d_1	≤	14.61	±	0.22
14.61	<	d_1	≤	15.95	±	0.23
15.95	<	d_1	≤	17.29	±	0.24
17.29	<	d_1	≤	18.64	±	0.25
18.64	<	d_1	≤	20.00	±	0.26
20.00	<	d_1	≤	21.36	±	0.27
21.36	<	d_1	≤	22.73	±	0.28
22.73	<	d_1	≤	24.10	±	0.29
24.10	<	d_1	≤	25.47	±	0.30
25.47	<	d_1	≤	26.85	±	0.31
26.85	<	d_1	≤	28.23	±	0.32
28.23	<	d_1	≤	29.61	±	0.33
29.61	<	d_1	≤	31.00	±	0.34
31.00	<	d_1	≤	32.39	±	0.35
32.39	<	d_1	≤	33.78	±	0.36
33.78	<	d_1	≤	35.18	±	0.37
35.18	<	d_1	≤	36.58	±	0.38
36.58	<	d_1	≤	37.98	±	0.39
37.98	<	d_1	≤	39.38	±	0.40
39.38	<	d_1	≤	40.79	±	0.41
40.79	<	d_1	≤	42.20	±	0.42
42.20	<	d_1	≤	43.61	±	0.43
43.61	<	d_1	≤	45.02	±	0.44
45.02	<	d_1	≤	46.44	±	0.45
46.44	<	d_1	≤	47.86	±	0.46
47.86	<	d_1	≤	49.28	±	0.47
49.28	<	d_1	≤	50.70	±	0.48
50.70	<	d_1	≤	52.12	±	0.49
52.12	<	d_1	≤	53.55	±	0.50
53.55	<	d_1	≤	54.98	±	0.51
54.98	<	d_1	≤	56.41	±	0.52
56.41	<	d_1	≤	57.84	±	0.53
57.84	<	d_1	≤	59.27	±	0.54

Inner diameter d_1 [mm]					Tolerance Δd_1 [mm]	
59.27	<	d_1	≤	60.71	±	0.55
60.71	<	d_1	≤	62.14	±	0.56
62.14	<	d_1	≤	63.58	±	0.57
63.58	<	d_1	≤	65.02	±	0.58
65.02	<	d_1	≤	66.47	±	0.59
66.47	<	d_1	≤	67.91	±	0.60
67.91	<	d_1	≤	69.35	±	0.61
69.35	<	d_1	≤	70.80	±	0.62
70.80	<	d_1	≤	72.25	±	0.63
72.25	<	d_1	≤	73.70	±	0.64
73.70	<	d_1	≤	75.15	±	0.65
75.15	<	d_1	≤	76.60	±	0.66
76.60	<	d_1	≤	78.05	±	0.67
78.05	<	d_1	≤	79.51	±	0.68
79.51	<	d_1	≤	80.97	±	0.69
80.97	<	d_1	≤	82.42	±	0.70
82.42	<	d_1	≤	83.88	±	0.71
83.88	<	d_1	≤	85.34	±	0.72
85.34	<	d_1	≤	86.80	±	0.73
86.80	<	d_1	≤	88.27	±	0.74
88.27	<	d_1	≤	89.73	±	0.75
89.73	<	d_1	≤	91.20	±	0.76
91.20	<	d_1	≤	92.66	±	0.77
92.66	<	d_1	≤	94.13	±	0.78
94.13	<	d_1	≤	95.60	±	0.79
95.60	<	d_1	≤	97.07	±	0.80
97.07	<	d_1	≤	98.54	±	0.81
98.54	<	d_1	≤	100.01	±	0.82
100.01	<	d_1	≤	101.48	±	0.83
101.48	<	d_1	≤	102.96	±	0.84
102.96	<	d_1	≤	104.43	±	0.85
104.43	<	d_1	≤	105.91	±	0.86
105.91	<	d_1	≤	107.39	±	0.87
107.39	<	d_1	≤	108.86	±	0.88
108.86	<	d_1	≤	110.34	±	0.89
110.34	<	d_1	≤	111.82	±	0.90
111.82	<	d_1	≤	113.30	±	0.91
113.30	<	d_1	≤	114.79	±	0.92
114.79	<	d_1	≤	116.27	±	0.93
116.27	<	d_1	≤	117.75	±	0.94
117.75	<	d_1	≤	119.24	±	0.95
119.24	<	d_1	≤	120.72	±	0.96
120.72	<	d_1	≤	122.21	±	0.97
122.21	<	d_1	≤	123.70	±	0.98

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Inner diameter d_1 [mm]					Tolerance Δd_1 [mm]
123.70	<	d_1	≤	125.19	± 0.99
125.19	<	d_1	≤	126.68	± 1.00
126.68	<	d_1	≤	128.17	± 1.01
128.17	<	d_1	≤	129.66	± 1.02
129.66	<	d_1	≤	131.15	± 1.03
131.15	<	d_1	≤	132.64	± 1.04
132.64	<	d_1	≤	134.14	± 1.05
134.14	<	d_1	≤	135.63	± 1.06
135.63	<	d_1	≤	137.13	± 1.07
137.13	<	d_1	≤	138.62	± 1.08
138.62	<	d_1	≤	140.12	± 1.09
140.12	<	d_1	≤	141.62	± 1.10
141.62	<	d_1	≤	143.12	± 1.11
143.12	<	d_1	≤	144.62	± 1.12
144.62	<	d_1	≤	146.12	± 1.13
146.12	<	d_1	≤	147.62	± 1.14
147.62	<	d_1	≤	149.12	± 1.15
149.12	<	d_1	≤	150.62	± 1.16
150.62	<	d_1	≤	152.13	± 1.17
152.13	<	d_1	≤	153.63	± 1.18
153.63	<	d_1	≤	155.13	± 1.19
155.13	<	d_1	≤	156.64	± 1.20
156.64	<	d_1	≤	158.15	± 1.21
158.15	<	d_1	≤	159.65	± 1.22
159.65	<	d_1	≤	161.16	± 1.23
161.16	<	d_1	≤	162.67	± 1.24
162.67	<	d_1	≤	164.18	± 1.25
164.18	<	d_1	≤	165.69	± 1.26
165.69	<	d_1	≤	167.20	± 1.27
167.20	<	d_1	≤	168.71	± 1.28
168.71	<	d_1	≤	170.22	± 1.29
170.22	<	d_1	≤	171.73	± 1.30
171.73	<	d_1	≤	173.25	± 1.31
173.25	<	d_1	≤	174.76	± 1.32
174.76	<	d_1	≤	176.28	± 1.33
176.28	<	d_1	≤	177.79	± 1.34
177.79	<	d_1	≤	179.31	± 1.35
179.31	<	d_1	≤	180.82	± 1.36
180.82	<	d_1	≤	182.34	± 1.37
182.34	<	d_1	≤	183.86	± 1.38
183.86	<	d_1	≤	185.38	± 1.39
185.38	<	d_1	≤	186.89	± 1.40
186.89	<	d_1	≤	188.41	± 1.41
188.41	<	d_1	≤	189.93	± 1.42

Inner diameter d_1 [mm]					Tolerance Δd_1 [mm]
189.93	<	d_1	≤	191.45	± 1.43
191.45	<	d_1	≤	192.98	± 1.44
192.98	<	d_1	≤	194.50	± 1.45
194.50	<	d_1	≤	196.02	± 1.46
196.02	<	d_1	≤	197.54	± 1.47
197.54	<	d_1	≤	199.07	± 1.48
199.07	<	d_1	≤	200.59	± 1.49
200.59	<	d_1	≤	202.12	± 1.50
202.12	<	d_1	≤	203.64	± 1.51
203.64	<	d_1	≤	205.17	± 1.52
205.17	<	d_1	≤	206.69	± 1.53
206.69	<	d_1	≤	208.22	± 1.54
208.22	<	d_1	≤	209.75	± 1.55
209.75	<	d_1	≤	211.28	± 1.56
211.28	<	d_1	≤	212.81	± 1.57
212.81	<	d_1	≤	214.34	± 1.58
214.34	<	d_1	≤	215.87	± 1.59
215.87	<	d_1	≤	217.40	± 1.60
217.40	<	d_1	≤	218.93	± 1.61
218.93	<	d_1	≤	220.46	± 1.62
220.46	<	d_1	≤	221.99	± 1.63
221.99	<	d_1	≤	223.52	± 1.64
223.52	<	d_1	≤	225.06	± 1.65
225.06	<	d_1	≤	226.59	± 1.66
226.59	<	d_1	≤	228.12	± 1.67
228.12	<	d_1	≤	229.66	± 1.68
229.66	<	d_1	≤	231.19	± 1.69
231.19	<	d_1	≤	232.73	± 1.70
232.73	<	d_1	≤	234.27	± 1.71
234.27	<	d_1	≤	235.80	± 1.72
235.80	<	d_1	≤	237.34	± 1.73
237.34	<	d_1	≤	238.88	± 1.74
238.88	<	d_1	≤	240.42	± 1.75
240.42	<	d_1	≤	241.95	± 1.76
241.95	<	d_1	≤	243.49	± 1.77
243.49	<	d_1	≤	245.03	± 1.78
245.03	<	d_1	≤	246.57	± 1.79
246.57	<	d_1	≤	248.11	± 1.80
248.11	<	d_1	≤	249.66	± 1.81
249.66	<	d_1	≤	251.20	± 1.82
251.20	<	d_1	≤	252.74	± 1.83
252.74	<	d_1	≤	254.28	± 1.84
254.28	<	d_1	≤	255.82	± 1.85
255.82	<	d_1	≤	257.37	± 1.86

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Inner diameter d_1 [mm]					Tolerance Δd_1 [mm]
257.37	<	d_1	≤	258.91	± 1.87
258.91	<	d_1	≤	260.46	± 1.88
260.46	<	d_1	≤	262.00	± 1.89
262.00	<	d_1	≤	263.55	± 1.90
263.55	<	d_1	≤	265.09	± 1.91
265.09	<	d_1	≤	266.64	± 1.92
266.64	<	d_1	≤	268.18	± 1.93
268.18	<	d_1	≤	269.73	± 1.94
269.73	<	d_1	≤	271.28	± 1.95
271.28	<	d_1	≤	272.83	± 1.96
272.83	<	d_1	≤	274.38	± 1.97
274.38	<	d_1	≤	275.92	± 1.98
275.92	<	d_1	≤	277.47	± 1.99
277.47	<	d_1	≤	279.02	± 2.00
279.02	<	d_1	≤	280.57	± 2.01
280.57	<	d_1	≤	282.12	± 2.02
282.12	<	d_1	≤	283.68	± 2.03
283.68	<	d_1	≤	285.23	± 2.04
285.23	<	d_1	≤	286.78	± 2.05
286.78	<	d_1	≤	288.33	± 2.06
288.33	<	d_1	≤	289.88	± 2.07
289.88	<	d_1	≤	291.44	± 2.08
291.44	<	d_1	≤	292.99	± 2.09
292.99	<	d_1	≤	294.54	± 2.10
294.54	<	d_1	≤	296.10	± 2.11
296.10	<	d_1	≤	297.65	± 2.12
297.65	<	d_1	≤	299.21	± 2.13
299.21	<	d_1	≤	300.76	± 2.14
300.76	<	d_1	≤	302.32	± 2.15
302.32	<	d_1	≤	303.88	± 2.16
303.88	<	d_1	≤	305.43	± 2.17
305.43	<	d_1	≤	306.99	± 2.18
306.99	<	d_1	≤	308.55	± 2.19
308.55	<	d_1	≤	310.11	± 2.20
310.11	<	d_1	≤	311.66	± 2.21
311.66	<	d_1	≤	313.22	± 2.22
313.22	<	d_1	≤	314.78	± 2.23
314.78	<	d_1	≤	316.34	± 2.24
316.34	<	d_1	≤	317.90	± 2.25
317.90	<	d_1	≤	319.46	± 2.26
319.46	<	d_1	≤	321.02	± 2.27
321.02	<	d_1	≤	322.58	± 2.28
322.58	<	d_1	≤	324.15	± 2.29
324.15	<	d_1	≤	325.71	± 2.30

Inner diameter d_1 [mm]					Tolerance Δd_1 [mm]
325.71	<	d_1	≤	327.27	± 2.31
327.27	<	d_1	≤	328.83	± 2.32
328.83	<	d_1	≤	330.39	± 2.33
330.39	<	d_1	≤	331.96	± 2.34
331.96	<	d_1	≤	333.52	± 2.35
333.52	<	d_1	≤	335.09	± 2.36
335.09	<	d_1	≤	336.65	± 2.37
336.65	<	d_1	≤	338.21	± 2.38
338.21	<	d_1	≤	339.78	± 2.39
339.78	<	d_1	≤	341.35	± 2.40
341.35	<	d_1	≤	342.91	± 2.41
342.91	<	d_1	≤	344.48	± 2.42
344.48	<	d_1	≤	346.04	± 2.43
346.04	<	d_1	≤	347.61	± 2.44
347.61	<	d_1	≤	349.18	± 2.45
349.18	<	d_1	≤	350.75	± 2.46
350.75	<	d_1	≤	352.31	± 2.47
352.31	<	d_1	≤	353.88	± 2.48
353.88	<	d_1	≤	355.45	± 2.49
355.45	<	d_1	≤	357.02	± 2.50
357.02	<	d_1	≤	358.59	± 2.51
358.59	<	d_1	≤	360.16	± 2.52
360.16	<	d_1	≤	361.73	± 2.53
361.73	<	d_1	≤	363.30	± 2.54
363.30	<	d_1	≤	364.87	± 2.55
364.87	<	d_1	≤	366.44	± 2.56
366.44	<	d_1	≤	368.01	± 2.57
368.01	<	d_1	≤	369.58	± 2.58
369.58	<	d_1	≤	371.16	± 2.59
371.16	<	d_1	≤	372.73	± 2.60
372.73	<	d_1	≤	374.30	± 2.61
374.30	<	d_1	≤	375.87	± 2.62
375.87	<	d_1	≤	377.45	± 2.63
377.45	<	d_1	≤	379.02	± 2.64
379.02	<	d_1	≤	380.59	± 2.65
380.59	<	d_1	≤	382.17	± 2.66
382.17	<	d_1	≤	383.74	± 2.67
383.74	<	d_1	≤	385.32	± 2.68
385.32	<	d_1	≤	386.89	± 2.69
386.89	<	d_1	≤	388.47	± 2.70
388.47	<	d_1	≤	390.05	± 2.71
390.05	<	d_1	≤	391.62	± 2.72
391.62	<	d_1	≤	393.20	± 2.73
393.20	<	d_1	≤	394.78	± 2.74

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Inner diameter d_1 [mm]					Tolerance Δd_1 [mm]
394.78	<	d_1	≤	396.35	± 2.75
396.35	<	d_1	≤	397.93	± 2.76
397.93	<	d_1	≤	399.51	± 2.77
399.51	<	d_1	≤	401.09	± 2.78
401.09	<	d_1	≤	402.66	± 2.79
402.66	<	d_1	≤	404.24	± 2.80
404.24	<	d_1	≤	405.82	± 2.81
405.82	<	d_1	≤	407.40	± 2.82
407.40	<	d_1	≤	408.98	± 2.83
408.98	<	d_1	≤	410.56	± 2.84
410.56	<	d_1	≤	412.14	± 2.85
412.14	<	d_1	≤	413.72	± 2.86
413.72	<	d_1	≤	415.30	± 2.87
415.30	<	d_1	≤	416.89	± 2.88
416.89	<	d_1	≤	418.47	± 2.89
418.47	<	d_1	≤	420.05	± 2.90
420.05	<	d_1	≤	421.63	± 2.91
421.63	<	d_1	≤	423.21	± 2.92
423.21	<	d_1	≤	424.80	± 2.93
424.80	<	d_1	≤	426.38	± 2.94
426.38	<	d_1	≤	427.96	± 2.95
427.96	<	d_1	≤	429.55	± 2.96
429.55	<	d_1	≤	431.13	± 2.97
431.13	<	d_1	≤	432.71	± 2.98
432.71	<	d_1	≤	434.30	± 2.99
434.30	<	d_1	≤	435.88	± 3.00
435.88	<	d_1	≤	437.47	± 3.01
437.47	<	d_1	≤	439.05	± 3.02
439.05	<	d_1	≤	440.64	± 3.03
440.64	<	d_1	≤	442.22	± 3.04
442.22	<	d_1	≤	443.81	± 3.05
443.81	<	d_1	≤	445.40	± 3.06
445.40	<	d_1	≤	446.98	± 3.07
446.98	<	d_1	≤	448.57	± 3.08
448.57	<	d_1	≤	450.16	± 3.09
450.16	<	d_1	≤	451.75	± 3.10
451.75	<	d_1	≤	453.33	± 3.11
453.33	<	d_1	≤	454.92	± 3.12
454.92	<	d_1	≤	456.51	± 3.13
456.51	<	d_1	≤	458.10	± 3.14
458.10	<	d_1	≤	459.69	± 3.15
459.69	<	d_1	≤	461.28	± 3.16
461.28	<	d_1	≤	462.87	± 3.17
462.87	<	d_1	≤	464.46	± 3.18

Inner diameter d_1 [mm]					Tolerance Δd_1 [mm]
464.46	<	d_1	≤	466.05	± 3.19
466.05	<	d_1	≤	467.64	± 3.20
467.64	<	d_1	≤	469.23	± 3.21
469.23	<	d_1	≤	470.82	± 3.22
470.82	<	d_1	≤	472.41	± 3.23
472.41	<	d_1	≤	474.00	± 3.24
474.00	<	d_1	≤	475.59	± 3.25
475.59	<	d_1	≤	477.19	± 3.26
477.19	<	d_1	≤	478.78	± 3.27
478.78	<	d_1	≤	480.37	± 3.28
480.37	<	d_1	≤	481.96	± 3.29
481.96	<	d_1	≤	483.56	± 3.30
483.56	<	d_1	≤	485.15	± 3.31
485.15	<	d_1	≤	486.74	± 3.32
486.74	<	d_1	≤	488.34	± 3.33
488.34	<	d_1	≤	489.93	± 3.34
489.93	<	d_1	≤	491.52	± 3.35
491.52	<	d_1	≤	493.12	± 3.36
493.12	<	d_1	≤	494.71	± 3.37
494.71	<	d_1	≤	496.31	± 3.38
496.31	<	d_1	≤	497.90	± 3.39
497.90	<	d_1	≤	499.50	± 3.40
499.50	<	d_1	≤	501.10	± 3.41
501.10	<	d_1	≤	502.69	± 3.42
502.69	<	d_1	≤	504.29	± 3.43
504.29	<	d_1	≤	505.89	± 3.44
505.89	<	d_1	≤	507.48	± 3.45
507.48	<	d_1	≤	509.08	± 3.46
509.08	<	d_1	≤	510.68	± 3.47
510.68	<	d_1	≤	512.27	± 3.48
512.27	<	d_1	≤	513.87	± 3.49
513.87	<	d_1	≤	515.47	± 3.50
515.47	<	d_1	≤	517.07	± 3.51
517.07	<	d_1	≤	518.67	± 3.52
518.67	<	d_1	≤	520.27	± 3.53
520.27	<	d_1	≤	521.87	± 3.54
521.87	<	d_1	≤	523.46	± 3.55
523.46	<	d_1	≤	525.06	± 3.56
525.06	<	d_1	≤	526.66	± 3.57
526.66	<	d_1	≤	528.26	± 3.58
528.26	<	d_1	≤	529.86	± 3.59
529.86	<	d_1	≤	531.46	± 3.60
531.46	<	d_1	≤	533.07	± 3.61
533.07	<	d_1	≤	534.67	± 3.62

O-rings

Inner diameter d_1 [mm]					Tolerance Δd_1 [mm]	
534.67	<	d_1	≤	536.27	±	3.63
536.27	<	d_1	≤	537.87	±	3.64
537.87	<	d_1	≤	539.47	±	3.65
539.47	<	d_1	≤	541.07	±	3.66
541.07	<	d_1	≤	542.68	±	3.67
542.68	<	d_1	≤	544.28	±	3.68
544.28	<	d_1	≤	545.88	±	3.69
545.88	<	d_1	≤	547.48	±	3.70
547.48	<	d_1	≤	549.09	±	3.71
549.09	<	d_1	≤	550.69	±	3.72
550.69	<	d_1	≤	552.29	±	3.73
552.29	<	d_1	≤	553.90	±	3.74
553.90	<	d_1	≤	555.50	±	3.75
555.50	<	d_1	≤	557.11	±	3.76
557.11	<	d_1	≤	558.71	±	3.77
558.71	<	d_1	≤	560.32	±	3.78
560.32	<	d_1	≤	561.92	±	3.79
561.92	<	d_1	≤	563.53	±	3.80
563.53	<	d_1	≤	565.13	±	3.81
565.13	<	d_1	≤	566.74	±	3.82
566.74	<	d_1	≤	568.34	±	3.83
568.34	<	d_1	≤	569.95	±	3.84
569.95	<	d_1	≤	571.56	±	3.85
571.56	<	d_1	≤	573.16	±	3.86
573.16	<	d_1	≤	574.77	±	3.87
574.77	<	d_1	≤	576.38	±	3.88
576.38	<	d_1	≤	577.98	±	3.89
577.98	<	d_1	≤	579.59	±	3.90
579.59	<	d_1	≤	581.20	±	3.91
581.20	<	d_1	≤	582.81	±	3.92
582.81	<	d_1	≤	584.42	±	3.93
584.42	<	d_1	≤	586.02	±	3.94
586.02	<	d_1	≤	587.63	±	3.95
587.63	<	d_1	≤	589.24	±	3.96
589.24	<	d_1	≤	590.85	±	3.97
590.85	<	d_1	≤	592.46	±	3.98
592.46	<	d_1	≤	594.07	±	3.99
594.07	<	d_1	≤	595.68	±	4.00
595.68	<	d_1	≤	597.29	±	4.01
597.29	<	d_1	≤	598.90	±	4.02
598.90	<	d_1	≤	600.00	±	4.03
		d_1	>	600.00	acc. to formula	

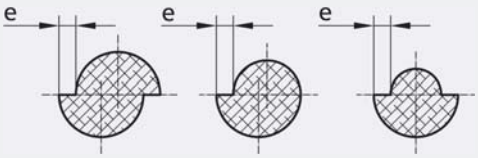
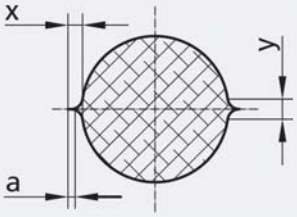
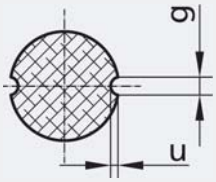
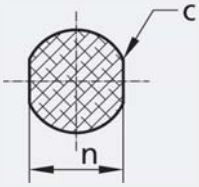
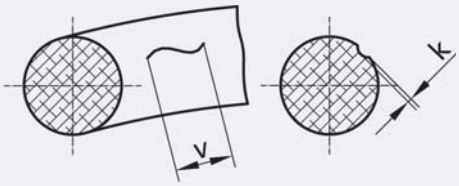
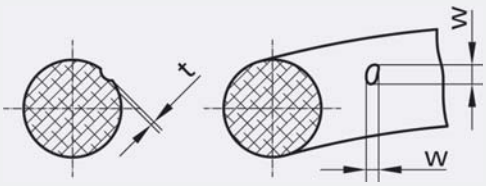
Cross section tolerances

acc. to DIN ISO 3601-1 class B (former DIN 3771-1)

Cross section d2 [mm]					Tolerance [mm]	
		d2	≤	0.80	±	0.08
0.80	<	d2	≤	2.25	±	0.08
2.25	<	d2	≤	3.15	±	0.09
3.15	<	d2	≤	4.50	±	0.10
4.50	<	d2	≤	6.30	±	0.13
6.30	<	d2	≤	8.40	±	0.15
8.40	<	d2	≤	10.00	±	0.20
10.00	<	d2	≤	12.00	±	0.25
		d2	>	12.00	on inquiry	

Surface imperfections acc. to ISO 3601-3

Maximum limits of imperfection for O-rings **Grade N**

Surface imperfection type	Diagrammatic representation	Dimensions	Maximum limits of imperfection Grade N for O-rings Cross section, d_2				
			> 0.80[b] ≤ 2.25	> 2.25 ≤ 3.15	> 3.15 ≤ 4.50	> 4.50 ≤ 6.30	> 6.30 ≤ 8,40[b]
Off-register, mismatch (offset)		e	0.08	0.10	0.13	0.15	0.15
Combined flash (combination of offset, flash and parting line projection)		x	0.10	0.12	0.14	0.16	0.18
		y	0.10	0.12	0.14	0.16	0.18
		a	When the flash can be differentiated, it shall not exceed 0.07mm.				
Backrind		g	0.18	0.27	0.36	0.53	0.70
		u	0.08	0.08	0.10	0.10	0.13
Excessive trimming (radial tool marks not allowed)		n	Trimming is allowed provided the dimension n is not reduced below the minimum diameter d_2 for the O-ring.				
Flow marks (radial orientation of flow marks is not permissible)		v	1.50[a]	1.50[a]	6.50[a]	6.50[a]	6.50[a]
		k	0.08	0.08	0.08	0.08	0.08
Non-fills and indentations (including parting line indentations)		w	0.60	0.80	1.00	1.30	1.70
		t	0.08	0.08	0.10	0.10	0.13
Foreign material	-	-	not allowed				

[a] Or 0.05 times the O-rings diameter (d1) whichever is greater.

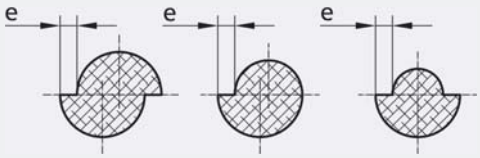
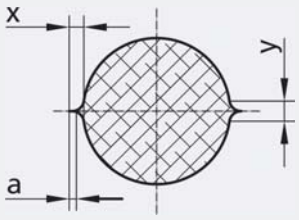
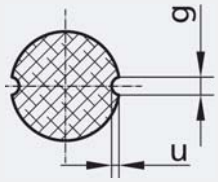
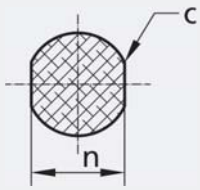
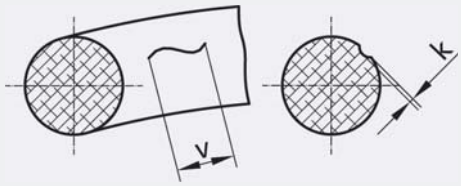
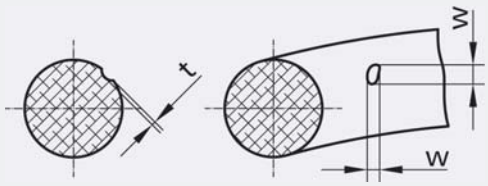
[b] Limits of imperfections for cross sections < 0.80 mm or > 8.40 mm shall be agreed upon between manufacturer and customer.

[c] Rounded edges.

All dimensions in mm.

Surface imperfections acc. to ISO 3601-3

Maximum limits of imperfection for O-rings **Grade S**

Surface imperfection type	Diagrammatic representation	Dimensions	Maximum limits of imperfection Grade N for O-rings Cross section, d_2				
			> 0.80[b] ≤ 2.25	> 2.25 ≤ 3.15	> 3.15 ≤ 4.50	> 4.50 ≤ 6.30	> 6.30 ≤ 8,40[b]
Off-register, mismatch (offset)		e	0.08	0.08	0.10	0.12	0.13
Combined flash (combination of offset, flash and parting line projection)		x	0.10	0.10	0.13	0.15	0.15
		y	0.10	0.10	0.13	0.15	0.15
		a	When the flash can be differentiated, it shall not exceed 0.07mm.				
Backrind		g	0.10	0.15	0.20	0.20	0.30
		u	0.05	0.08	0.10	0.10	0.13
Excessive trimming (radial tool marks not allowed)		n	Trimming is allowed provided the dimension n is not reduced below the minimum diameter d_2 for the O-ring.				
Flow marks (radial orientation of flow marks is not permissible)		v	1.50[a]	1.50[a]	5.00[a]	5.00[a]	5.00[a]
		k	0.05	0.05	0.05	0.05	0.05
Non-fills and indentations (including parting line indentations)		w	0.15	0.25	0.40	0.63	1.00
		t	0.08	0.08	0.10	0.10	0.13
Foreign material	-	-	not allowed				

[a] Or 0.05 times the O-rings diameter (d1) whichever is greater.

[b] Limits of imperfections for cross sections < 0.80 mm or > 8.40 mm shall be agreed upon between manufacturer and customer.

[c] Rounded edges.

All dimensions in mm.

Tests on O-rings

The inner diameter d1 is measured by conical plug gauges or stepped plug gauges. Alternatively the inner diameter can be measured by optical instruments or a circumference tape is used for large diameters.

The cross section d2 is measured by a thickness gauge with reduced contact pressure. Alternatively, optical measuring methods can be applied. Form and surface accuracy is tested visually.

The hardness test, depending on the size of the O-ring, is made according to DIN ISO 7619-1 (DIN 53505) Shore A or DIN ISO 48 (IRHD Micro). The tolerance for hardness tests is ±5 points.