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МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Fluid systems — Sealing devices — O-rings —

Part 1:
Inside diameters, cross-sections, tolerances and size identification code

Systèmes de fluides — Joints d'étanchéité — Joints toriques —

Partie 1: Diamètres intérieurs, sections, tolérances et code d'identification dimensionnelle

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 3601-1 was prepared by Technical Committee ISO/TC 131, *Fluid power systems.*

This second edition cancels and replaces the first edition (ISO 3601-1 : 1978) of which it constitutes a technical revision. This new edition includes the requirements for Series A O-rings, for aerospace applications.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Fluid systems — Sealing devices — O-rings —

Part 1:
Inside diameters, cross-sections, tolerances and size identification code

0 Introduction

ISO 3601 deals with O-rings and comprises the following parts:

Part 1: Inside diameters, cross-sections, tolerances and size identification code.

Part 2: Design criteria for O-ring housings.

Part 3: Quality acceptance criteria.

1 Scope and field of application

This part of ISO 3601 specifies the inside diameters, cross-sections, tolerances and size identification code for O-rings used in fluid systems.

The dimensions and tolerances specified in this part of ISO 3601 are suitable for any elastomeric material provided that suitable tooling is available.

CAUTION — The tooling most commonly available is based on 70 IRHD NBR shrinkage rates (see ISO 48).

2 References

ISO 3, *Preferred numbers — Series of preferred numbers.*

ISO 48, *Vulcanized rubbers — Determination of hardness (Hardness between 30 and 85 IRHD).*

ISO 5598, *Fluid power systems and components — Vocabulary.*

3 Definitions

For the purposes of this part of ISO 3601, the definitions given in ISO 5598 apply.

NOTE — Throughout this part of ISO 3601, the term "O-ring" has been adopted although the correct technical term is "toroidal sealing ring".

4 Configuration

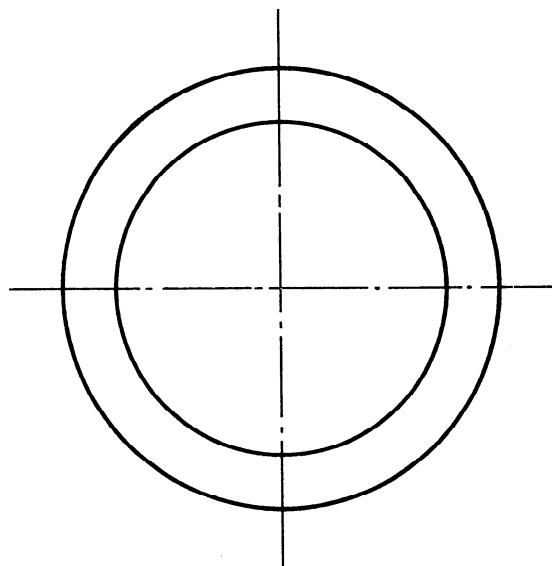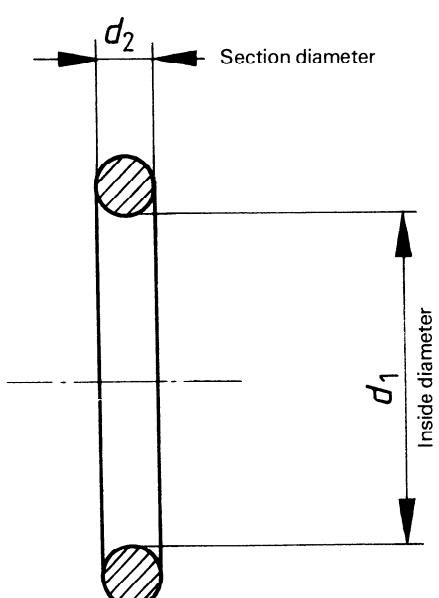The shape of the O-ring shall be toroidal, as shown in the figure.

Figure — Typical O-ring configuration

5 Inside diameters, d_1, cross-sections (section diameter), d_2, and tolerances

The combinations of inside diameters, cross-sections and tolerances shall be chosen from table 2 (Series G for general-purpose applications) or table 3 (Series A for aerospace applications).

See caution note in clause 1.

NOTE — The dimensions for the inside diameter were selected from the series of preferred numbers (see ISO 3).

6 Size identification code

O-rings shall be designated by a six-character alphanumeric size identification code which shall be arranged in the same way as in the example below for a general-purpose O-ring having an inside diameter, d_1, of 3,55 mm and a section diameter, d_2, of 1,8 mm.

A   0035   G

Letter symbol to represent the section diameter, d_2 (see table 1) _____

Four-digit element to represent the inside diameter, d_1, expressed in tenths of a millimetre _____

NOTE — The decimal is assumed to be placed after the third digit of this element. The code omits the second decimal place of d_1, even though many dimensions d_1 are specified to a hundredth of a millimetre.

Letter symbol to indicate application

— G: general-purpose application _____

— A: aerospace application

NOTE — This element may be omitted when the basic standard for the parts concerned defines the application.

Table 1 — Letter symbol for first element of size identification code

Cross-section (section diameter) d_2 mm	Letter symbol
1,8	A
2,65	B
3,55	C
5,3	D
7	E

Further examples of size identification code

Size code	$d_2 \times d_1$	Application
B0345A	2,65 mm × 34,5 mm	Aerospace
C0500A	3,55 mm × 50 mm	Aerospace
D2300G	5,3 mm × 230 mm	General purpose
E4620G	7 mm × 462 mm	General purpose

7 Identification statement (Reference to this part of ISO 3601)

Use the following statement in test reports, catalogues and sales literature when electing to comply with this part of ISO 3601 :1988

"Inside diameters, cross-sections, tolerances and size identification code area in accordance with ISO 3601-1, *Fluid systems — Sealing devices — O-rings — Part 1: Inside diameters, cross-sections, tolerances and size identification code.*"

Table 2 — Inside diameters, cross-sections and tolerances for general-purpose applications — Series G

Dimensions in millimetres

d_1	tol. ±	1,8 ±0,08	2,65 ±0,09	3,55 ±0,1	5,3 ±0,13	7 ±0,15
1,8	0,13	×				
2	0,13	×				
2,24	0,13	×				
2,5	0,13	×				
2,8	0,14	×				
3,15	0,14	×				
3,55	0,14	×				
3,75	0,14	×				
4	0,14	×				
4,5	0,14	×				
4,87	0,15	×				
5	0,15	×				
5,15	0,15	×				
5,3	0,15	×				
5,6	0,15	×				
6	0,15	×				
6,3	0,15	×				
6,7	0,16	×				
6,9	0,16	×				
7,1	0,16	×				
7,5	0,16	×				
8	0,16	×				
8,5	0,16	×				
8,75	0,17	×				
9	0,17	×				
9,5	0,17	×				
10	0,17	×				
10,6	0,18	×				
11,2	0,18	×				
11,8	0,19	×				
12,5	0,19	×				
13,2	0,19	×				
14	0,19	×	×			
15	0,2	×	×			
16	0,2	×	×			
17	0,21	×	×			
18	0,21		×	×		
19	0,22		×	×		
20	0,22		×	×		
21,2	0,23		×	×		
22,4	0,24		×	×		
23,6	0,24		×	×		
25	0,25		×	×		
25,8	0,26		×	×		
26,5	0,26		×	×		
28	0,28		×	×		
30	0,29		×	×		
31,5	0,31		×	×		
32,5	0,32		×	×		
33,5	0,32		×	×		
34,5	0,33			×	×	
35,5	0,34			×	×	
36,5	0,35			×	×	
37,5	0,36			×	×	
38,7	0,37			×	×	
40	0,38			×	×	
41,2	0,39			×	×	
42,5	0,4			×	×	
43,7	0,41			×	×	
45	0,42			×	×	
46,2	0,43			×	×	
47,5	0,44			×	×	
48,7	0,45			×	×	
50	0,46			×	×	
51,5	0,47			×	×	
53	0,48			×	×	
54,5	0,5			×	×	
56	0,51			×	×	
58	0,52			×	×	
60	0,54			×	×	
61,5	0,55			×	×	
63	0,56			×	×	
65	0,58			×	×	
67	0,59			×	×	
69	0,61			×	×	
71	0,63			×	×	
73	0,64			×	×	
75	0,66			×	×	
77,5	0,67			×	×	
80	0,69			×	×	
82,5	0,71			×	×	
85	0,73			×	×	
87,5	0,75			×	×	
90	0,77			×	×	
92,5	0,79			×	×	
95	0,81			×	×	
97,5	0,83			×	×	
100	0,84			×	×	
103	0,87			×	×	
106	0,89			×	×	
109	0,91			×	×	×
112	0,93			×	×	×
115	0,95			×	×	×
118	0,97			×	×	×
122	1			×	×	×
125	1,03			×	×	×
128	1,05			×	×	×
132	1,08			×	×	×
136	1,1			×	×	×
140	1,13			×	×	×
145	1,17			×	×	×
150	1,2			×	×	×
155	1,24			×	×	×
160	1,27			×	×	×
165	1,31			×	×	×
170	1,34			×	×	×
175	1,38			×	×	×
180	1,41			×	×	×
185	1,44			×	×	×
190	1,48			×	×	×
195	1,51			×	×	×
200	1,55			×	×	×
206	1,59				×	×
212	1,63				×	×
218	1,67				×	×
224	1,71				×	×
230	1,75				×	×
236	1,79				×	×
243	1,83				×	×
250	1,88				×	×
258	1,93				×	×
265	1,98				×	×
272	2,02				×	×
280	2,08				×	×
290	2,14				×	×
300	2,21				×	×
307	2,25				×	×
315	2,3				×	×
325	2,37				×	×
335	2,43				×	×
345	2,49				×	×
355	2,56				×	×
365	2,62				×	×
375	2,68				×	×
387	2,76				×	×
400	2,84				×	×
412	2,91					×
425	2,99					×
437	3,07					×
450	3,15					×
462	3,22					×
475	3,3					×
487	3,37					×
500	3,45					×
515	3,54					×
530	3,63					×
545	3,72					×
560	3,81					×
580	3,93					×
600	4,05					×
615	4,13					×
630	4,22					×
650	4,34					×
670	4,46					×

Table 3 — Inside diameters, cross-sections and tolerances for aerospace applications — Series A

Dimensions in millimetres

d_1	tol. ±	d_2 1,8 ±0,08	2,65 ±0,09	3,55 ±0,1	5,3 ±0,13	7 ±0,15
1,8	0,13	×				
2	0,13	×				
2,24	0,13	×				
2,5	0,13	×				
2,8	0,13	×				
3,15	0,13	×				
3,55	0,13	×				
3,75	0,13	×				
4	0,13	×				
4,5	0,13	×	×			
4,87	0,13	×				
5	0,13	×				
5,15	0,13	×				
5,3	0,13	×	×			
5,6	0,13	×				
6	0,13	×	×			
6,3	0,13	×				
6,7	0,13	×				
6,9	0,14	×	×			
7,1	0,14	×				
7,5	0,14	×				
8	0,14	×	×			
8,5	0,15	×				
8,75	0,15	×				
9	0,15	×	×			
9,5	0,15	×	×			
10	0,15	×	×			
10,6	0,16	×	×			
11,2	0,16	×	×			
11,8	0,17	×	×			
12,5	0,17	×	×			
13,2	0,17	×	×			
14	0,18	×	×	×		
15	0,18	×	×	×		
16	0,19	×	×	×		
17	0,2	×	×	×		
18	0,2	×	×	×		
19	0,21	×	×	×		
20	0,21	×	×	×		
21,2	0,22	×	×	×		
22,4	0,23	×	×	×		
23,6	0,24	×	×	×		
25	0,24	×	×	×		
25,8	0,25	×	×	×		
26,5	0,25	×	×	×		
28	0,26	×	×	×		
30	0,27	×	×	×		
31,5	0,28	×	×	×		
32,5	0,29	×	×	×		
33,5	0,29	×	×	×		

d_1	tol. ±	d_2 1,8 ±0,08	2,65 ±0,09	3,55 ±0,1	5,3 ±0,13	7 ±0,15
34,5	0,3	×	×	×		
35,5	0,31	×	×	×		
36,5	0,31	×	×	×		
37,5	0,32	×	×	×	×	
38,7	0,32	×	×	×	×	
40	0,33	×	×	×	×	
41,2	0,34	×	×	×	×	
42,5	0,35	×	×	×	×	
43,7	0,35	×	×	×	×	
45	0,36	×	×	×	×	
46,2	0,37		×	×	×	
47,5	0,38	×	×	×	×	
48,7	0,38		×	×	×	
50	0,39	×	×	×	×	
51,5	0,4		×	×	×	
53	0,41	×	×	×	×	
54,5	0,42	×	×	×	×	
56	0,42	×	×	×	×	
58	0,44	×	×	×	×	
60	0,45	×	×	×	×	
61,5	0,45		×	×	×	
63	0,46		×	×	×	
65	0,48	×	×	×	×	
67	0,49		×	×	×	
69	0,5		×	×	×	
71	0,51	×	×	×	×	
73	0,52		×	×	×	
75	0,53	×	×	×	×	
77,5	0,55			×	×	
80	0,56	×	×	×	×	
82,5	0,57			×	×	
85	0,59	×	×	×	×	
87,5	0,6			×	×	
90	0,62	×	×	×	×	
92,5	0,63			×	×	
95	0,64	×	×	×	×	
97,5	0,66			×	×	
100	0,67	×	×	×	×	
103	0,69			×	×	
106	0,71	×	×	×	×	
109	0,72			×	×	×
112	0,74	×	×	×	×	×
115	0,76			×	×	×
118	0,77	×	×	×	×	×
122	0,8			×	×	×
125	0,81	×	×	×	×	×
128	0,83	×	×	×	×	×
132	0,85		×	×	×	×
136	0,87		×	×	×	×
140	0,89		×	×	×	×

d_1	tol. ±	d_2 1,8 ±0,08	2,65 ±0,09	3,55 ±0,1	5,3 ±0,13	7 ±0,15
145	0,92			×	×	×
150	0,95		×	×	×	×
155	0,98			×	×	×
160	1		×	×	×	×
165	1,03			×	×	×
170	1,06		×	×	×	×
175	1,09			×	×	×
180	1,11		×	×	×	×
185	1,14			×	×	×
190	1,17		×	×	×	×
195	1,2			×	×	×
200	1,22		×	×	×	×
206	1,26					×
212	1,29			×	×	×
218	1,32				×	×
224	1,35			×	×	×
230	1,39			×	×	×
236	1,42			×	×	
243	1,46			×		×
250	1,49			×	×	×
258	1,54				×	×
265	1,57				×	×
272	1,61				×	×
280	1,65				×	×
290	1,71				×	×
300	1,76				×	×
307	1,8				×	×
315	1,84				×	×
325	1,9					×
335	1,95				×	×
345	2					×
355	2,06				×	×
365	2,11					×
375	2,16					×
387	2,23					×
400	2,29					×

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