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Fluid power systems and components — Cylinder-rod wiper-ring housings in reciprocating applications — Dimensions and tolerances

Transmissions hydrauliques et pneumatiques — Logements de joints racleurs pour tiges de piston à mouvement linéaire de vérins — Dimensions et tolérances

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Sub-committee SC 7, *Sealing devices.*

This fourth edition cancels and replaces the third edition (ISO 6915:2013), which has been technically revised.

The main changes compared to the previous edition are as follows:

— wiper housing sizes for 400 mm and 450 mm rod diameters have been added to Tables 1, 2, 3, 4 and 5.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

In fluid power systems, power is transmitted and controlled through a fluid (liquid or gas) under pressure within an enclosed circuit. Wiper-rings are used to prevent ingress of contaminants and to thereby protect the seals and bearings within the equipment.

This document is one of a family of standards covering dimensions and tolerances of reciprocating seal housings.

This document is applicable to the following five housing designs:

— Type A: recessed housings with undercut or separate cover to retain elastomeric wipers.

— Type B: open recessed housings for wipers with integral rigid enforcement that are press-fit in the housing.

— Type C: recessed housings with undercut to retain elastomeric wipers (these are the preferred housings for double lip wipers without integral rigid enforcement).

— Type D: recessed housings with undercut to retain elastomer-energized, plastic-faced wipers.

— Type E: recessed housings with undercut or separate cover to retain elastomeric wipers (these are the preferred housings to Type A).

These housing designs are intended for use with the wiper-rings according to Figure 1.

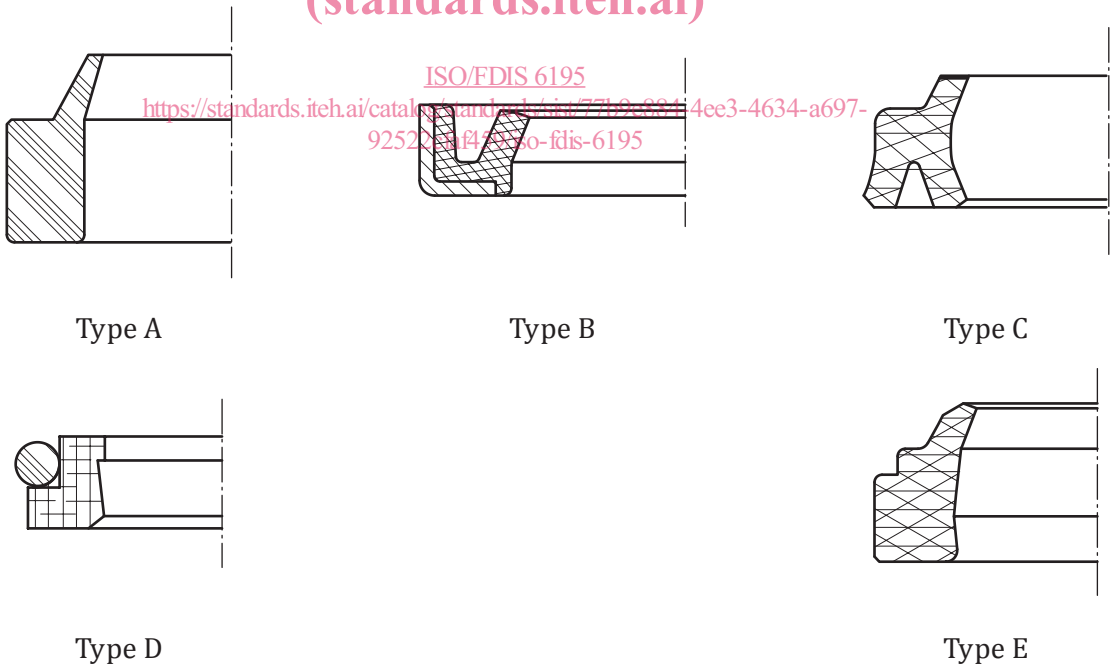


Figure 1 — Types of wiper-rings

This document does not otherwise specify the style, configurations, materials, or performance ratings for the wiper-ring.

Fluid power systems and components — Cylinder-rod wiper-ring housings in reciprocating applications — Dimensions and tolerances

1 Scope

This document specifies dimensions and tolerances of housings for wiper-rings used in reciprocating rod applications for fluid power cylinders. The range of rod diameters is from 4 mm to 450 mm.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4287:1997, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters*

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

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Symbols

The symbols used in this document are as follows:

a	roughness of the side surface of the wiper housing
b	roughness of the surface of the wiper housing bore
C	axial length of the lead-in chamfer
$C0$	reference material ratio level
d	rod diameter
D_1	outside diameter of wiper housing
D_2	retainer diameter
e	roughness of the rod
f	roughness of the leading chamfer
L_1	axial length of the wiper housing
L_2	maximum wiper assembly length
L_3	retainer width
r	radius
Ra	arithmetical mean deviation of the assessed profile

Rδc	profile section height difference
Rmr	material ratio of the profile
Rz	maximum height of profile
S	radial depth (cross-section) of the housing, $\frac{(D_1 - d)}{2}$

5 General

The wiper-ring is usually fitted to a hydraulic cylinder gland in conjunction with a rod seal. For rod seal housings see ISO 5597 and ISO 7425-2.

The wiper-ring manufacturer should be consulted on the suitability of a particular type of wiper-ring for the application.

Sharp edges and burrs shall be removed from corners of supporting surfaces and rounded.

Surface finishes have a significant impact upon the performance and lifetime of the wipers. Recommended surface finishes are shown in Figures 2, 3, 4, 5 and 6 (see also Clause 8 for surface roughness recommendations).

6 Requirements for housings

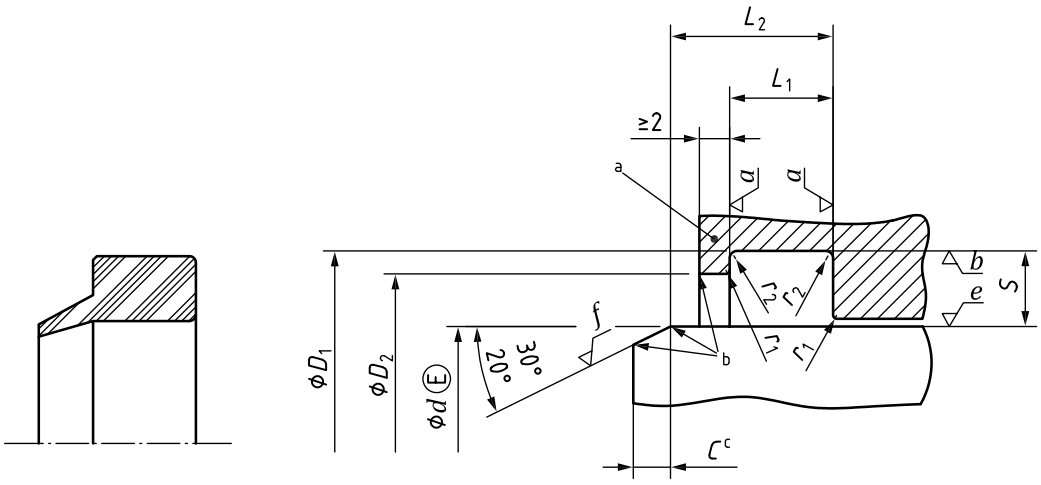
6.1 Type A housing

6.1.1 Type A housing and a typical wiper-ring are shown in Figure 2.

6.1.2 Type A housing dimensions and tolerances shall conform to Table 1.

6.1.3 Type A wiper-rings are recommended for use with cylinders conforming to ISO 6020-1 and to ISO 6022.

Dimensions in millimetres



Key

a May be integral or with separate retaining plate.

b Rounded and burr free.

c See Table 6 for dimensions.

Figure 2 — Type A wiper housing and typical wiper-ring

Table 1 — Dimensions for Type A wiper housing

Dimensions in millimetres

Rod diameter [a, b]	Radial depth	Outside diameter	Axial length	Wiper assembly length	Retainer diameter	Retainer radius	Radius
d	S	D_1 H11[d]	L_1	L_2 max	D_2 H11[d]	r_1 max	r_2 [c] max
4	4,0	12	$5{,}0\ ^{+0,2}_{0}$	8	9,5	0,3	0,5
5		13			10,5		
6		14			11,5		
8		16			13,5		
10		18			15,5		
12		20			17,5		
14		22			19,5		
16		24			21,5		
18		26			23,5		
20		28			25,5		
22		30			27,5		
25		33			30,5		
28		36			33,5		
32		40			37,5		
36		44			41,5		
40		48			45,5		
45		53			50,5		
50		58			55,5		
56	5,0	66	$6{,}3\ ^{+0,2}_{0}$	10	63	0,4	
63		73			70		
70		80			77		
80		90			87		
90		100			97		
100	7,5	115	$9{,}5\ ^{+0,3}_{0}$	14	110	0,6	
110		125			120		
125		140			135		
140		155			150		
160		175			170		
180		195			190		
200		215			210		

[a] See ISO 3320 and ISO 5597.

[b] One-piece housing can be used with rod diameters greater than 14 mm

[c] These specific dimensions permit the use of tools conforming to ISO 883.

[d] Tolerances and fits are according to ISO 286-2.

Table 1 *(continued)*

Rod diameter [a, b]	Radial depth	Outside diameter	Axial length	Wiper assembly length	Retainer diameter	Retainer radius	Radius
d	S	D_1 H11[d]	L_1	L_2 max	D_2 H11[d]	r_1 max	r_2 [c] max
220	10,0	240	12,5 $^{+0,3}_{0}$	18	233,5	0,8	0,9
250		270			263,5		
280		300			293,5		
320		340			333,5		
360		380			373,5		
400		420			413,5		
450		470			463,5		

[a] See ISO 3320 and ISO 5597.

[b] One-piece housing can be used with rod diameters greater than 14 mm

[c] These specific dimensions permit the use of tools conforming to ISO 883.

[d] Tolerances and fits are according to ISO 286-2.

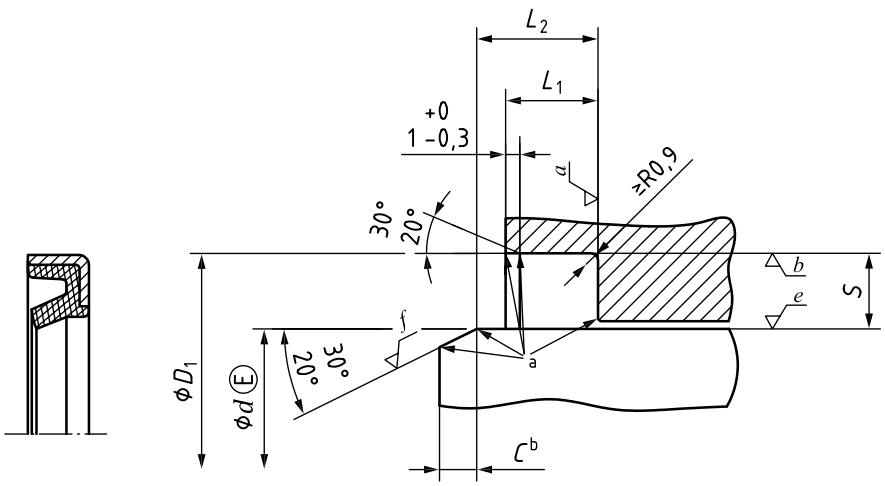
6.2 Type B housing

6.2.1 Type B housing and a typical wiper-rings are shown in Figure 3.

6.2.2 Type B housing dimensions and tolerances shall conform to Table 2.

6.2.3 Type B wiper-rings are recommended for use with cylinders conforming to ISO 6020-1 and to ISO 6022.

Dimensions in millimetres



Key

[a] Rounded and burr free.

[b] See Table 6 for dimensions.

Figure 3 — Type B wiper housing and typical wiper-ring

Table 2 — Dimensions for Type B wiper housings

Dimensions in millimetres

Rod diameter [a]	Radial depth	Outside diameter	Axial length	Wiper assembly length
d	S	D_1 H8[b]	L_1 $^{+0,5}_{0}$	L_2 max
4	4,0	12	5	8
5		13		
6		14		
8		16		
10		18		
12	5,0	22	7	11
14		24		
16		26		
18		28		
20		30		
22		32		
25		35		
28		38		
32		42		
36		46		
40		50		
45		55		
50		60		
56		66		
63		73		
70		80		
80		90		
90		100		
100	7,5	115	9	13
110		125		
125		140		
140		155		
160		175		
180		195		
200		215		
220	10,0	240	12	16
250		270		
280		300		
320		340		
360		380		
400		420		
450		470		

[a] See ISO 3320 and ISO 5597.

[b] Tolerances and fits are according to ISO 286-2.