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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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Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.ch](mailto:copyright@iso.ch)  
Web [www.iso.ch](http://www.iso.ch)

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 6195 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 7, *Sealing devices*.

This second edition cancels and replaces the first edition (ISO 6195:1986), which has been technically revised.

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## Introduction

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

This International Standard is one of a series of standards covering the dimensions and tolerances of housings.

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

## 1 Scope

This International Standard 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 360 mm.

This International Standard is applicable to the following four housing designs.

- Type A: recessed housings with undercut or separate cover to retain elastomeric wipers (these are the preferred housings for single lip wipers without integral rigid enforcement).
- Type B: open recessed housings for wipers with integral rigid enforcement, that are a 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.

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

## 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 883, *Indexable hardmetal (carbide) inserts with rounded corners, without fixing hole — Dimensions*

ISO 3320, *Fluid power systems and components — Cylinder bores and piston rod diameters — Metric series*

ISO 5597, *Hydraulic fluid power — Cylinders — Housings for piston and rod seals in reciprocating applications — Dimensions and tolerances*

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

ISO 6020-1, *Hydraulic fluid power — Mounting dimensions for single rod cylinders, 16 MPa (160 bar) series — Part 1: Medium series*

ISO 6020-2, *Hydraulic fluid power — Mounting dimensions for single rod cylinders, 16 MPa (160 bar) series — Part 2: Compact series*

ISO 6020-3, *Hydraulic fluid power — Mounting dimensions for single rod cylinders, 16 MPa (160 bar) series — Part 3: Compact series with bores from 250 mm to 500 mm*

ISO 6022, *Hydraulic fluid power — Single rod cylinders — Mounting dimensions — 250 bar (25 000 kPa) series*

### 3 Terms and definitions

For the purposes of this International Standard, the terms and definitions given in ISO 5598 apply.

### 4 Letter symbols

The letter symbols used in this International Standard are as follows.

$d$	rod diameter
$D_1$	outside diameter of wiper housing
$D_2$	retainer diameter
$C$	axial length of the lead-in chamfer
$L_1$	axial length of the wiper housing
$L_2$	maximum length of the wiper
$L_3$	retainer width
$S = \frac{D_1 - d}{2}$	radial depth (cross-section) of the housing
$r$	radius

### 5 General

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.

Supporting surfaces are required to provide maximum support.

### 6 Dimensions and tolerances

#### 6.1 Type A housing

6.1.1 An example of a type A housing is shown in Figure 1.

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



Table 1 — Dimensions for type A wiper housings

Dimensions in millimetres

Rod diameter <sup>a, b</sup> <i>d</i>	Radial depth <i>S</i>	Outside diameter <i>D</i> <sub>1</sub> H11	Axial length <i>L</i> <sub>1</sub>	Wiper length <i>L</i> <sub>2</sub> max.	Retainer diameter <i>D</i> <sub>2</sub> H11	<i>r</i> <sub>1</sub> max.	<i>r</i> <sub>2</sub> <sup>c</sup> max.
4	4	12	5 <sup>+0,2</sup> <sub>0</sub>	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	66	6,3 <sup>+0,2</sup> <sub>0</sub>	10	63	0,4	
63		73			70		
70		80			77		
80		90			87		
90		100			97		
100	7,5	115	9,5 <sup>+0,3</sup> <sub>0</sub>	14	110	0,6	
110		125			120		
125		140			135		
140		155			150		
160		175			170		
180		195			190		
200		215			210		
220		240			233,5		
250	10	270	12,5 <sup>+0,3</sup> <sub>0</sub>	18	263,5	0,8	0,9
280		300			293,5		
320		340			333,5		
360		380			373,5		

<sup>a</sup> See ISO 3320 and ISO 5597.

<sup>b</sup> One-piece housings can be used with rod diameters greater than 14 mm.

<sup>c</sup> These specific dimensions permit the use of tools conforming to ISO 883.

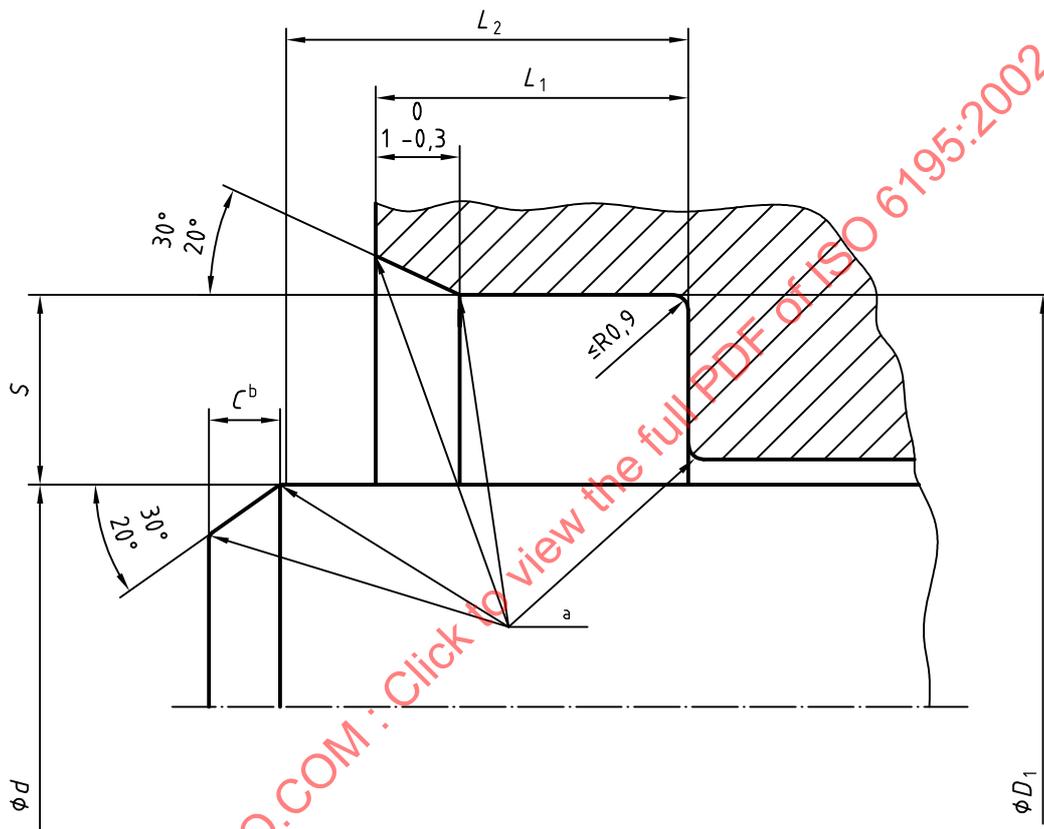
**6.2 Type B housing**

6.2.1 An example of a type B housing is shown in Figure 2.

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



- a Rounded and burr free.
- b See Table 5 for dimensions.

**Figure 2 — Example of type B wiper housing**

Table 2 — Dimensions for type B wiper housings

Dimensions in millimetres

Rod diameter <sup>a</sup> <i>d</i>	Radial depth <i>S</i>	Outside diameter <i>D</i> <sub>1</sub> H8	Axial length <i>L</i> <sub>1</sub> $\begin{matrix} +0,5 \\ 0 \end{matrix}$	Wiper length <i>L</i> <sub>2</sub> max.
4	4	12	5	8
5		13		
6		14		
8		16		
10		18		
12	5	22	7	11
14		24		
16		26		
18		28		
20		30		
22		32		
28		38		
25		35		
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	240	12	16
250		270		
280		300		
320		340		
360		380		

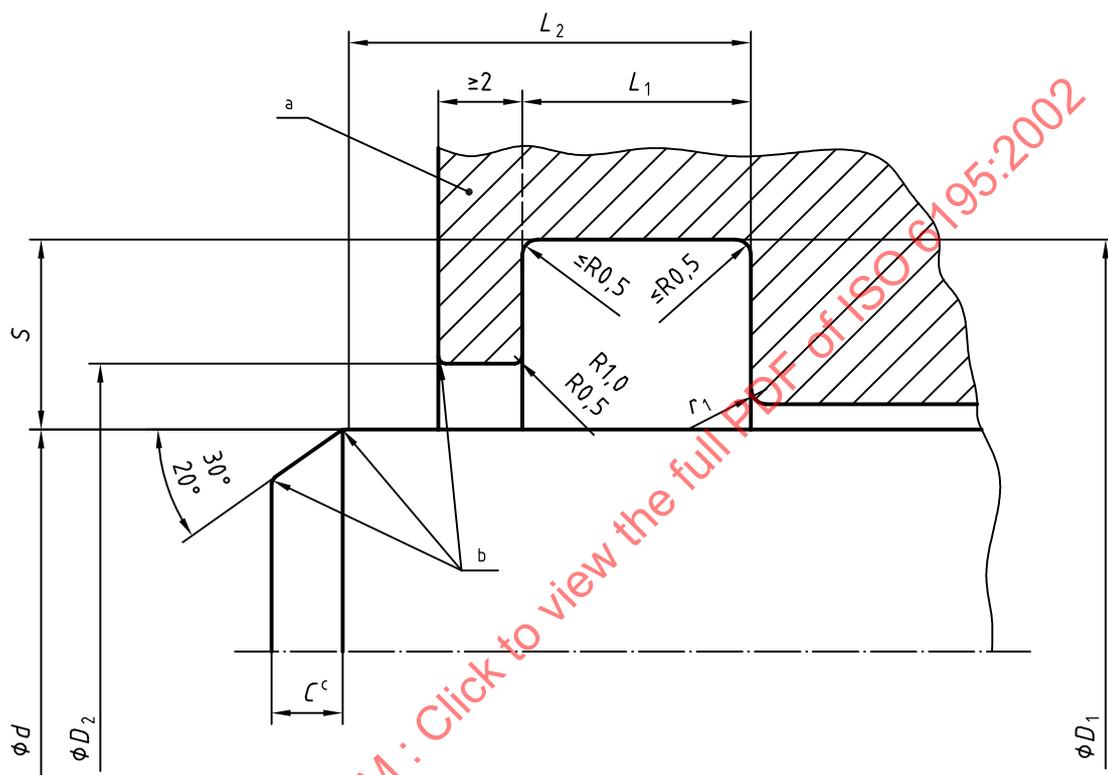
<sup>a</sup> See ISO 3320 and ISO 5597.

6.3 Type C housing

6.3.1 An example of a type C housing is shown in Figure 3.

6.3.2 Type C housing dimensions and tolerances shall conform to Table 3 (the sizes for use with glands conforming to ISO 6020-2, to ISO 6020-3 and to ISO 10762 are indicated).

Dimensions in millimetres



- a May be integral or with separate retaining plate.
- b Rounded and burr free.
- c See Table 5 for dimensions.

Figure 3 — Example of type C wiper housing

Table 3 — Dimensions for type C wiper housings

Dimensions in millimetres

Rod diameter <sup>a, b</sup> <i>d</i>	Radial depth <i>S</i>	Outside diameter <i>D</i> <sub>1</sub> H11	Axial length <i>L</i> <sub>1</sub>	Wiper length <i>L</i> <sub>2</sub> max.	Retainer diameter <i>D</i> <sub>2</sub> H11	Radius <i>r</i> <sub>1</sub> max.
4	3	10	4 <sup>+0,2</sup> <sub>0</sub>	7	6,5	0,3
5		11			7,5	
6		12			8,5	
8		14			10,5	
10		16			12,5	
12 <sup>c</sup>		18			14,5	
14 <sup>c</sup>		20			16,5	
16		22			18,5	
18 <sup>c</sup>		24			20,5	
20		26			22,5	
22 <sup>c</sup>		28			24,5	
25		31			27,5	
28 <sup>c</sup>		4			36	
32	40		35			
36 <sup>c</sup>	44		39			
40	48		43			
45 <sup>c</sup>	53		48			
50	58		53			
56 <sup>c</sup>	5	66	6 <sup>+0,2</sup> <sub>0</sub>	9,7	59	0,4
63		73			66	
70 <sup>c</sup>		80			73	
80		90			83	
90 <sup>c</sup>		100			93	
100		110			103	
110 <sup>c</sup>	7,5	125	8,5 <sup>+0,3</sup> <sub>0</sub>	13,0	114	0,4
125		140			129	
140 <sup>c, d</sup>		155			144	
160		175			164	
180 <sup>d</sup>		195			184	
200		215			204	
220 <sup>d</sup>	10	240	12 <sup>+0,3</sup> <sub>0</sub>	18	226	0,6
250 <sup>d</sup>		270			256	
280 <sup>d</sup>		300			286	
320		340			326	
360 <sup>d</sup>		380			366	

<sup>a</sup> See ISO 3320 and ISO 5597.<sup>b</sup> Split housings should be used for rod diameters up to and including 18 mm.<sup>c</sup> These sizes are recommended for use with cylinders conforming to ISO 6020-2 and to ISO 10762.<sup>d</sup> These sizes are recommended for use with cylinders conforming to ISO 6020-3.

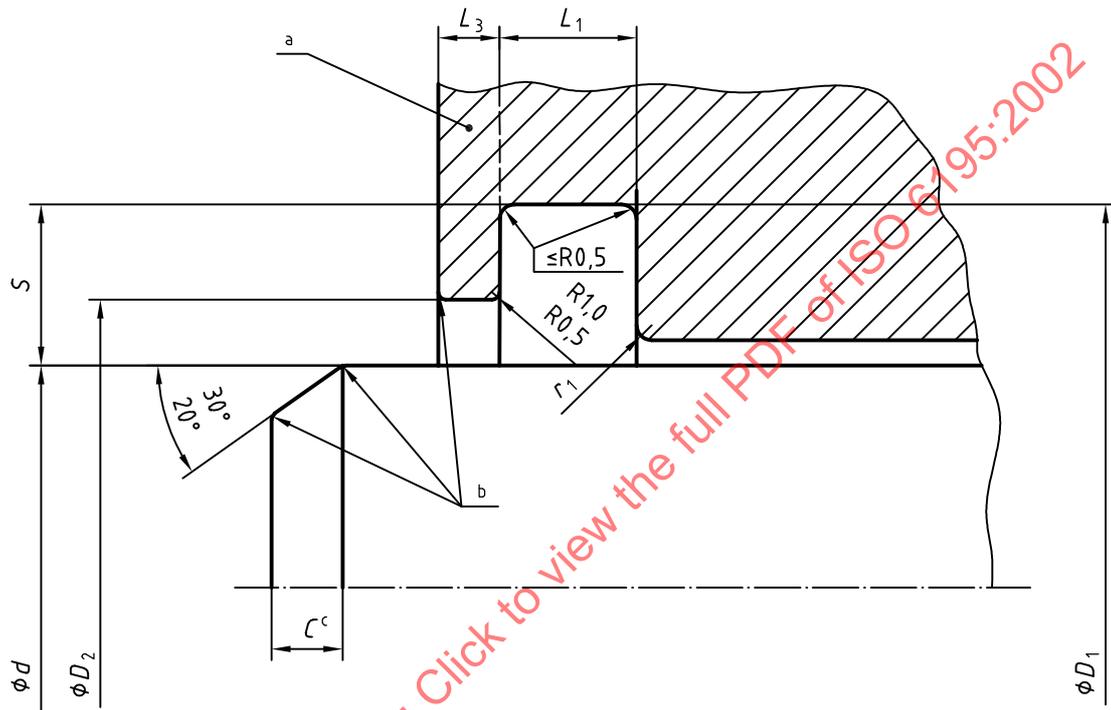
## 6.4 Type D housing

6.4.1 An example of a type D housing is shown in Figure 4.

6.4.2 Type D housing dimensions and tolerances shall conform to Table 4.

6.4.3 Type D wiper rings are recommended for use with all sizes of ISO cylinders.

Dimensions in millimetres



- a May be integral or with separate retaining plate.
- b Rounded and burr free.
- c See Table 5 for dimensions.

Figure 4 — Example of a type D wiper housing

Table 4 — Dimensions for type D wiper housings

Dimensions in millimetres

Rod diameter <sup>a, b</sup> <i>d</i>	Radial depth <i>S</i>	Outside diameter <i>D</i> <sub>1</sub> H9	Axial length <i>L</i> <sub>1</sub> <sup>+0,2</sup> 0	Retainer diameter <i>D</i> <sub>2</sub> H11	Retainer width <i>L</i> <sub>3</sub> min.	Radius <i>r</i> <sub>1</sub> max.
4	2,4	8,8	3,7	5,5	2	0,4
5		9,8		6,5		
6		10,8		7,5		
8		12,8		9,5		
10		14,8		11,5		
12	3,4	18,8	5	13,5		0,8
14		20,8		15,5		
16		22,8		17,5		
18		24,8		19,5		
20		26,8		21,5		
22		28,8		23,5		
25		31,8		26,5		
28		34,8		29,5		
32		38,8		33,5		
36		42,8		37,5		
40 <sup>c</sup>	3,4	46,8	5	41,5	2	
	4,4	48,8	6,3		3	
45	3,4	51,8	5	46,5	2	
	4,4	53,8	6,3		3	
50	3,4	56,8	5	51,5	2	
	4,4	58,8	6,3		3	
56	3,4	62,8	5	57,5	2	
	4,4	64,8	6,3		3	
63	3,4	69,8	5	64,5	2	
	4,4	71,8	6,3		3	
70	4,4	78,8	6,3	71,5	3	
	6,1	82,2	8,1	72	4	
80	4,4	88,8	6,3	81,5	3	
	6,1	92,2	8,1	82	4	
90	4,4	98,8	6,3	91,5	3	
	6,1	102,2	8,1	92	4	
100	4,4	108,8	6,3	101,5	3	1
	6,1	112,2	8,1	102	4	
110	4,4	118,8	6,3	111,5	3	
	6,1	122,2	8,1	112	4	
125	4,4	133,8	6,3	126,5	3	
	6,1	137,2	8,1	127	4	
140	6,1	152,2	8,1	142	4	
	8	156	9,5	142,5	5	
160	6,1	172,2	8,1	162	4	1
	8	176	9,5	162,5	5	1,5