

INTERNATIONAL
STANDARD

ISO
10766

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**Hydraulic fluid power — Cylinders —
Housing dimensions for
rectangular-section-cut bearing rings for
pistons and rods**
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Transmissions hydrauliques — Vérins — Dimensions de logements de dispositifs de guidage à section rectangulaire pour pistons et tiges de piston
<https://standards.iteh.ai/en/standards/sist/38bf346-1aac-4b6a-a3c0-30ad7c701d0f/iso-10766-1996>



Reference number
ISO 10766:1996(E)

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 voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 10766 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 7, *Sealing devices*.

Annex A of this International Standard is for information only.

Hydraulic fluid power — Cylinders — Housing dimensions for rectangular-section-cut bearing rings for pistons and rods

1 Scope

This International Standard specifies the preferred range of nominal dimensions and associated tolerances for a series of hydraulic cylinder piston and rod housings for rectangular-section-cut bearing rings, of the type shown in figure 1, for applications in the following range of dimensions:

- for cylinders with bores of 16 mm to 500 mm, inclusive;
- for rods with diameters of 12 mm to 360 mm, inclusive.

This International Standard does not give details of cut bearing ring design, because the manner of construction of cut bearing rings varies with each manufacturer.

The design and material of cut bearing rings and any incorporated anti-extrusion component are determined by conditions such as temperature and pressure.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 286-2:1988, *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts.*

ISO 4287:1996, *Geometrical Product Specification (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters.*

ISO 5598:1985, *Fluid power systems and components — Vocabulary.*

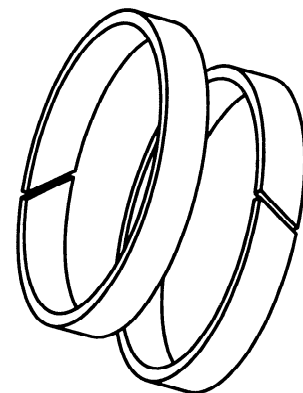


Figure 1 — Typical example of rectangular-section-cut bearing ring

3 Definitions

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

4 Symbols

The following letter codes and symbols are used in this International Standard:

$AL^{1)}$ outside diameter (bore diameter) of the bearing housing (see figure 2)

D_1 outside diameter (groove diameter) of the bearing housing (see figure 3)

d_1 inside diameter (groove diameter) of the bearing housing (see figure 2)

$MM^{1)}$ inside diameter (rod diameter) of the bearing housing (see figure 3)

G internal diameter of the gland (see figure 3)

L axial length of the housing (see figures 2 and 3)

P outside diameter of the piston head (see figure 2)

S radial depth of the housing (see figures 2 and 3)

$$S = \frac{AL - d_1}{2} \text{ for pistons (see figure 2)}$$

$$S = \frac{D_1 - MM}{2} \text{ for rods (see figure 3)}$$

5 General requirements

5.1 Corners

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

5.2 Surface finish

5.2.1 The value of requirements Ra and Rt (see ISO 4287) for the surface finish of the bearing ring housing should not exceed $3,2 \mu\text{m}$ for Ra and $16 \mu\text{m}$ for Rt .

5.2.2 The surface finish of the working surface (bore or rod) against which the bearing ring operates is usually dictated by the requirements of any associated seal, but it should preferably not exceed $0,6 \mu\text{m}$ for Ra and $2,4 \mu\text{m}$ for Rt .

1) Taken from ISO 6099.

NOTE 1 Where surface roughness measurements are taken, it is recommended that instruments complying with ISO 3274, including an electric wave filter, be used.

5.3 Nominal housing dimensions

Nominal dimensions of the rectangular-section housings shall be in accordance with the dimensions given in table 1.

Table 1 — Nominal dimensions of rectangular-section housings

Dimensions in millimetres

L	4	5,6	9,7	15	25	
S	1,55	2,5	2,5	2,5	2,5	4

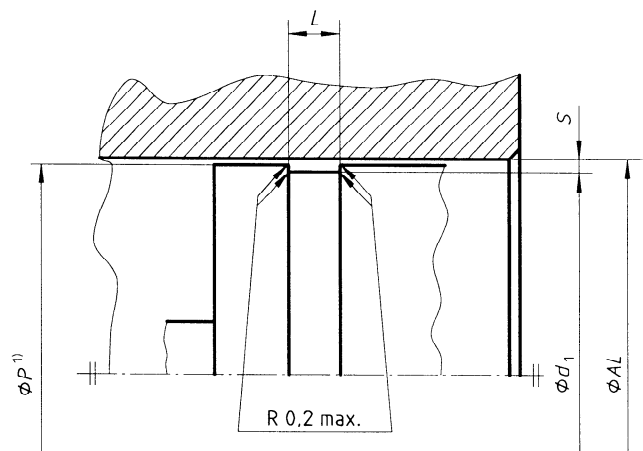
6 Dimensions of cut bearing ring housings

6.1 Dimensions of housings for pistons

Cut bearing ring housings for pistons shall be in accordance with figure 2 and table 2. For tolerances, the requirements given in clause 7 shall apply.

Several bearing rings can be fitted into multiple grooves, if necessary, to meet the required length.

Dimensions in millimetres



1) See clause 8.

Figure 2 — Cut bearing ring housing for pistons

Table 2 — Dimensions of cut bearing ring housings for pistons

Dimensions in millimetres

<i>AL</i>	<i>d</i> ₁	<i>L</i>	<i>S</i>
16	11	5,6	2,5
	12,9	4	1,55
20	15	5,6	2,5
	16,9	4	1,55
25	20	5,6	2,5
	21,9	4	1,55
32	27	5,6	2,5
	28,9	4	1,55
40	35	5,6	2,5
	36,9	4	1,55
50	45	5,6	2,5
	46,9	4	1,55
63	58	5,6	2,5
		9,7	
80	75	5,6	2,5
		9,7	
100	95	5,6	2,5
		9,7	
125	120	5,6	2,5
		9,7	
140	135	9,7	2,5
		15	
160	155	9,7	2,5
		15	
180	175	9,7	2,5
		15	

<i>AL</i>	<i>d</i> ₁	<i>L</i>	<i>S</i>
200	195	9,7	2,5
		15	
220	215	9,7	2,5
		15	
250	245	9,7	2,5
		15	
280	275	15	2,5
		25	
320	315	25	2,5
		15	
360	312	25	2,5
		15	
400	395	25	2,5
		15	
450	445	25	2,5
		15	
500	495	25	2,5
		15	
500	492	25	4
		15	

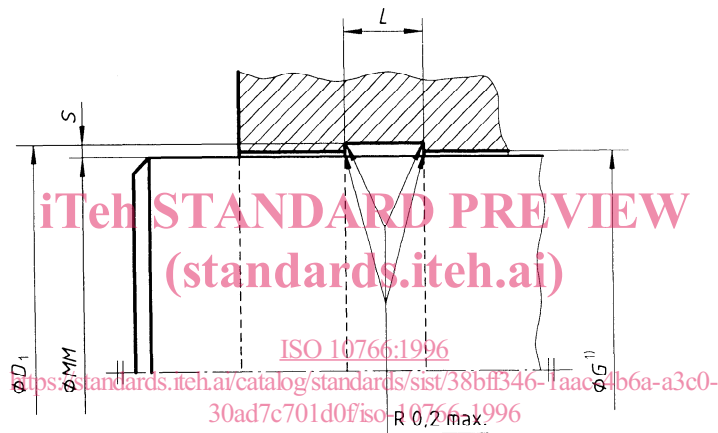
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6.2 Dimensions of housings for rods

Cut bearing ring housings for rods shall be in accordance with figure 3 and table 3. For tolerances, the requirements given in clause 7 shall apply.

Several bearing rings can be fitted into multiple grooves, if necessary, to meet the required length.

Dimensions in millimetres



1) See clause 8.

Figure 3 — Cut bearing ring housing for rods

Table 3 — Dimensions of cut bearing ring housings for rods

Dimensions in millimetres

MM	D ₁	L	S
12	15,1	4	1,55
14	17,1	4	
16	19,1	4	
18	21,1	4	
20	23,1	4	
22	25,1	4	
25	28,1	4	1,55
	30	5,6	2,5
28	31,1	4	1,55
	33	5,6	2,5
32	37	5,6	2,5
		9,7	
36	41	5,6	
		9,7	
40	45	5,6	
		9,7	
45	50	5,6	
		9,7	
50	55	5,6	
		9,7	
56	61	5,6	
		9,7	
63	68	5,6	
		9,7	
70	75	5,6	
		9,7	
80	85	9,7	
		15	
90	95	9,7	
		15	

MM	D ₁	L	S
100	105	9,7	2,5
		15	
110	115	9,7	
		15	
125	130	9,7	
		15	
140	145	9,7	
		15	
160	165	9,7	
		15	
180	185	9,7	
		15	
200	205	15	
		25	
220	225	15	
		25	
250	255	15	
		25	
280	285	15	
		25	
320	325	15	
		25	
360	365	15	
		25	
368	368	25	
		4	

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7 Tolerances

The dimensions of housings for cut bearing rings shall be within the limits given in table 4.

Table 4 — Tolerances for dimensions of cut bearing ring housings

Tolerances in millimetres

Dimension	Limits	
AL	No more than H10 (see ISO 286-2)	
D_1	≤ 115 mm	$\begin{matrix} +0,05 \\ 0 \end{matrix}$
	> 115 mm	$\begin{matrix} +0,08 \\ 0 \end{matrix}$
G	See clause 8	
d_1	≤ 100 mm	$\begin{matrix} 0 \\ -0,05 \end{matrix}$
	> 100 mm	$\begin{matrix} 0 \\ -0,08 \end{matrix}$
L	$\begin{matrix} +0,2 \\ 0 \end{matrix}$	
MM	Usually related to seal requirements, but typically f8 to h9 (see ISO 286-2)	
P	See clause 8	
S	Nominal size only	

8 Extrusion gap

The extrusion gap for piston applications is the difference between diameters AL and P (see figure 2). It may be further increased by the expansion of the cylinder that results from internal pressure.

The extrusion gap for rod applications is the difference between diameters G and MM (see figure 3).

It is recommended that details concerning diameter P or G are the subject of consultation between the housing designer and bearing ring manufacturer, taking account of the bearing ring material and the operating conditions.

9 Identification statement (Reference to this International Standard)

Use the following statement in test reports, catalogues and sales literature when electing to comply with this International Standard:

"Housings for rectangular-section-cut bearing rings for pistons and rods conform to ISO 10766:1996, *Hydraulic fluid power — Cylinders — Housing dimensions for rectangular-section-cut bearing rings for pistons and rods.*"

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Annex A (informative)

Bibliography

- [1] ISO 286-1:1988, *ISO system of limits and fits — Part 1: Bases of tolerances, deviations and fits.*
- [2] ISO 3274:1996, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Nominal characteristics of contact (stylus) instruments.*
- [3] ISO 3320:1987, *Fluid power systems and components — Cylinder bores and piston rod diameters — Metric series.*
- [4] ISO 4288:1996, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Rules and procedures for the assessment of surface texture.*
- [5] ISO 6020-1:1981, *Hydraulic fluid power — Single rod cylinders — Mounting dimensions — 160 bar (16 000 kPa) series — Part 1: Medium series.*
- [6] ISO 6022:1981, *Hydraulic fluid power — Single rod cylinders — Mounting dimensions — 250 bar (25 000 kPa) series.*
- [7] ISO 6099:1985, *Fluid power systems and components — Cylinders — Identification code for mounting dimensions and mounting types.*

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