SLOVENSKI STANDARD
SIST ISO 7425-1:1997

01-februar-1997

Fluidna tehnika - Hidravlika - Gnezda za elastomerne tesnilke - Mere in tolerance - 1. del: Gnezda batnih tesnilk

Hydraulic fluid power -- Housings for elastomer-energized, plastic-faced seals -- Dimensions and tolerances -- Part 1: Piston seal housings

Transmissions hydrauliques -- Logements pour joints en élastomère renforcé par des matières plastiques -- Partie 1: Logements de joints de piston

Ta slovenski standard je istoveten z: ISO 7425-1:1988

ICS:

23.100.20	Hidravlični valji	Cylinders

SIST ISO 7425-1:1997 **en**

INTERNATIONAL STANDARD

ISO 7425-1

First edition
1988-11-01

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION
ORGANISATION INTERNATIONALE DE NORMALISATION
МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Hydraulic fluid power — Housings for elastomer-energized, plastic-faced seals — Dimensions and tolerances —

Part 1 :
Piston seal housings

Transmissions hydrauliques — Logements pour joints en élastomère renforcé par des matières plastiques — Dimensions et tolérances —

Partie 1 : Logements de joints de piston

Reference number
ISO 7425-1 : 1988 (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 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 7425-1 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*.

ISO 7425 consists of the following parts, under the general title *Hydraulic fluid power — Housings for elastomer-energized, plastic-faced seal — Dimensions and tolerances*:

— *Part 1: Piston seal housings*

— *Part 2: Rod seal housings*

Annex A of this part of ISO 7425 is for information only.

Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit. Piston seals are required to prevent leakage of the liquid under pressure from one part of the cylinder to the other.

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Hydraulic fluid power — Housings for elastomer-energized, plastic-faced seals — Dimensions and tolerances —

Part 1 : Piston seal housings

1 Scope

This part of ISO 7425 specifies the dimensions and associated tolerances for a series of piston seal housings to accommodate elastomer-energized, plastic-faced seals used in reciprocating applications.

It is not the intention of this part of ISO 7425 to stipulate details of seal design, since the manner of construction of seals varies with each manufacturer. The design and material of the seals and any associated anti-extrusion components are determined by conditions such as temperature and pressure.

This part of ISO 7425 applies only to the dimensional characteristics of products manufactured in accordance with this part of ISO 7425. It does not apply to their functional characteristics.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 7425. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 7425 are encouraged to investigate the possibility of applying the most recent editions of the standards listed 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 3320 : 1987, *Fluid power systems and components — Cylinder bores and piston rod diameters — Metric series.*

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

3 Definitions

For the purposes of this part of ISO 7425, the definitions given in ISO 5598 apply.

4 Letter symbols

Letter symbols used in this part of ISO 7425 are as follows:

D = bore diameter (outside diameter of the seal housing)

d = piston seal groove diameter (inside diameter of the seal housing)

$S = \frac{(D - d)}{2}$; radial depth (cross-section) of the seal housing

L_1 = axial length (seal groove length) of the seal housing without back-up rings

L_2 = axial length (seal groove length) of the seal housing with back-up rings

C = axial length of the lead-in chamfer

d_3 = clearance diameter of the piston

5 Seal housings

5.1 General

5.1.1 An illustrated example of a typical hydraulic cylinder piston seal housing covered by this part of ISO 7425 is given in figure 1.

NOTE — The figure is diagrammatic only and does not represent an endorsement or recommendation of a particular housing design.

5.1.2 All sharp edges and burrs shall be removed from the supporting surfaces, although it should be borne in mind that these surfaces are required to provide maximum support against extrusion.

5.1.3 The seal manufacturer shall be consulted for details of housing design which are not specified in this part of ISO 7425.

5.2 Axial length

Axial lengths for the nominal piston diameters shown are given in table 2.

NOTE — If the extrusion gap exceeds the capabilities of the plastic-faced material to bridge such a gap, lengths L_2 should be selected and back-up rings (anti-extrusion rings) used. See clause 7.

5.3 Radial depth

5.3.1 Radial depths are given in table 2.

NOTE — This part of ISO 7425 includes an alternative seal housing radial depth for bore diameters where $D \geqslant 25$ mm.

5.3.2 The larger radial depths shall be selected where higher stresses or wider tolerances are involved; however, consultation with the manufacturer is recommended when making the appropriate selection.

6 Dimensions and tolerances

Seal housing dimensions and tolerances shall be selected from table 2.

7 Extrusion gap

The extrusion gap ($D - d_3$; see figure 1) is determined by the bore diameter and adjacent metal components on either side of the seal.

NOTES

1 The extrusion gap will vary considerably depending on use or non-use of non-metallic bearings on the piston.

2 Maximum value for the extrusion gap is achieved when the piston is in contact with one side of the cylinder or bearing.

3 The extrusion gap is further widened by the expansion of the cylinder due to internal pressure.

4 It is recommended that details concerning the extrusion gap and need for non-extrusion rings be subject to consultations between the housing designer and seal manufacturer.

8 Surface finish

The requirements for the surface finish of the components in contact with the seal are dependent on the application and its life requirement and should be subject to agreement between the purchaser and seal manufacturer.

9 Lead-in chamfer

9.1 To protect the seal from damage during assembly, lead-in chamfers are required, either as an integral part of housing components or on separate assembly tools.

9.2 Reference shall be made to figure 1 for typical location of lead-in chamfers when these are part of the housing component.

9.3 The minimum axial length of lead-in chamfers, whether on housing components or assembly tools, is given in table 1.

Table 1 — Lead-in chamfer

Dimensions in millimetres

Radial depth of seal housing, S nom.	2,5	3,75	5 5,5	7,5 7,75	10 10,5	12,25 12,5	15	20
Minimum axial length of lead-in chamfer, C	1,5	2	2,5	4	5	6,5	7,5	10

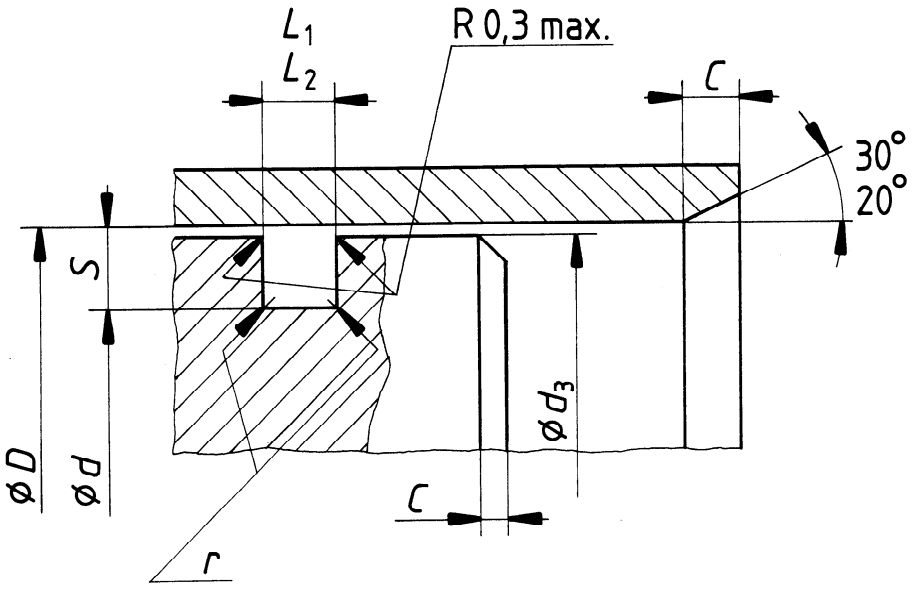

Figure 1 — Example of piston seal housing

Table 2 — Dimensions and tolerances of seal housings

Dimensions in millimetres

Bore diameter[1] D H9[2]	Radial depth S nom.	Groove diameter d h9[2]	Axial length L_1 (without back-up rings) $^{+0,2}_{0}$	Axial length L_2 (with back-up rings) $^{+0,2}_{0}$	r max.
16	2,5	11	2,2	—	0,5
	3,75	8,5	3,2		
20	2,5	15	2,2		
	3,75	12,5	3,2		
25	3,75	17,5	3,2		
	5,5	14	4,2		
	5	15	5	8	
32	3,75	24,5	3,2	—	
	5,5	21	4,2		
	5	22	5	8	
40	3,75	32,5	3,2	—	
	5,5	29	4,2		
	5	30	5	8	
50	5,5	39	4,2	—	
	7,75	34,5	6,3		
	7,5	35	7,5	12,5	
63	5,5	52	4,2	—	
	7,75	47,5	6,3		
	7,5	48	7,5	12,5	
80	5,5	69	4,2	—	0,9
	7,75	64,5	6,3		
	10	60	10	16	
100	5,5	89	4,2	—	
	7,75	84,5	6,3		
	10	80	10	16	
125	7,75	109,5	6,3	—	
	10,5	104	8,1		
	10	105	10	16	
160	7,75	144,5	6,3	—	
	10,5	139	8,1		
	12,5	135	12,5	20	
200	7,75	184,5	6,3	—	
	10,5	179	8,1		
	12,5	175	12,5	20	
250	10,5	229	8,1	—	
	12,25	225,5	8,1		
	15	220	15	25	
320	10,5	299	8,1	—	
	12,25	295,5	8,1		
	15	290	15	25	
400	12,25	375,5	8,1	—	
	15	370	12,5		
	20	360	20	32	
500	12,25	475,5	8,1	—	
	15	470	12,5		
	20	460	20	32	

1) Bore diameters in accordance with ISO 3320.
2) See ISO 286-2.