

# INTERNATIONAL STANDARD

# ISO 7425-2

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

### Part 2 : Rod seal housings

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

*Partie 2 : Logements de joints de tige*



Reference number  
ISO 7425-2 : 1989 (E)

**ISO 7425-2 : 1989 (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 7425-2 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 seals — Dimensions and tolerances*:

- *Part 1: Piston seal housings*
- *Part 2: Rod seal housings*

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## Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit. Sealing devices are used to contain the pressurized fluid within components having elements with linear motion, i.e. hydraulic cylinders. These sealing devices are used with both cylinder rod and piston seal housings.

This part of ISO 7425 is one of a series of standards covering dimensions and tolerances, and relates to housings for a specific type of rod seal. Alternative choices of housing size may be found in ISO 5597 : 1987, *Hydraulic fluid power — Cylinders — Housings for piston and rod seals in reciprocating applications — Dimensions and tolerances*.

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

## Part 2 : Rod seal housings

### 1 Scope

This part of ISO 7425 specifies the dimensions and associated tolerances for a series of hydraulic cylinder rod 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 seal and any incorporated anti-extrusion component 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:

$C$  = axial length of the lead-in chamfer

$L$  = axial length of the seal housing (seal groove length)

$d$  = inside diameter of the seal housing (rod diameter)

$D$  = outside diameter of the seal housing (groove diameter)

$d_4$  = clearance diameter of the rod seal housing

$r$  = groove corner radius

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

### 5 Seal housings

#### 5.1 General

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

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

5.1.2 All sharp edges and burrs shall be removed from corners of 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 rod diameters shown are given in table 2.

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## 5.3 Radial depth

## 5.3.1 Radial depths are given in table 2.

NOTE — This part of 7425 includes an alternative seal housing radial depth for some rod diameters.

5.3.2 The larger radial depth (where available) shall be selected where higher stress 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

7.1 The extrusion gap is determined by the difference between diameters  $d_4$  and  $d$  and by any lack of coaxiality of the housing components.

NOTE — Maximum value is achieved when the piston rod is in contact with one side of the bearing.

7.2 It is recommended that details concerning the extrusion gap and need for any anti-extrusion devices be the subject of consultation between the housing designer and seal manufacturer.

## 8 Surface roughness

The requirements for the surface roughness of the components in contact with the seal are dependent on the application and

its life requirement and should be subject to agreement between manufacturer and user.

## 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 the rod end or on a separate assembly tool.

9.2 Reference shall be made to figure 1 for typical location of lead-in chamfer when these are part of the rod end.

9.3 The minimum length of lead-in chamfers, whether on the rod end or assembly tool, is given in table 1.

Table 1 — Lead-in chamfer

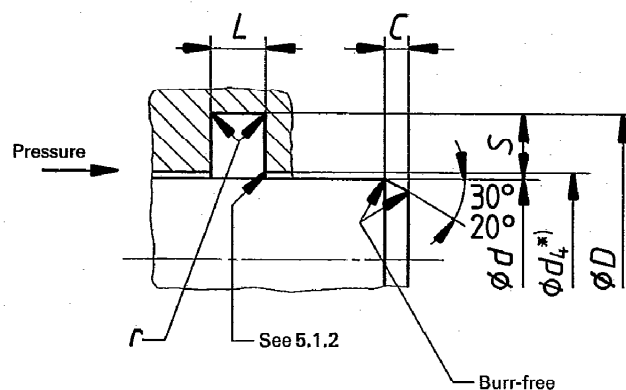
Dimensions in millimetres

Radial depth of seal housing (cross-section), $S$ nom.	2,5	3,75	5,5	7,75	10,5	12,25
Minimum length of chamfer, $C$	1,5	2	2,5	4	5	6,5

## 10 Identification statement (Reference to this part of ISO 7425)

Use the following statement in test reports, catalogues and sales literature when electing to comply with this part of ISO 7425:

"Dimensions and tolerances for hydraulic cylinder rod seal housings selected in accordance with ISO 7425-2, *Hydraulic fluid power — Housings for elastomer-energized, plastic-faced seals — Dimensions and tolerances — Part 2: Rod seal housings.*"



\*) See clause 7.

Figure 1 — Example of rod seal housing

Table 2 — Dimensions and tolerances of seal housing

Dimensions in millimetres

Rod diameter <sup>1)</sup> <i>d</i> f8 <sup>2)</sup>	Groove diameter <i>D</i>		Housing radial depth <i>S</i> nom.	Axial length <i>L</i> + 0,25 0	<i>r</i> max.
		tol.			
6	11	H9 <sup>2)</sup>	2,5	2,2	0,5
8	13				
10	15				
12	17				
	19,5				
14	19				
	21,5				
16	23,5				
18	25,5				
20	27,5				
	31				
22	29,5				
	33				
25	32,5				
	36				
28	39				
32	43				
36	47				
40	51				
45	56				
50	61				
56	67				
	71,5				
63	74				
	78,5				
70	85,5				
80	95,5				
90	105,5				
100	115,5				
110	125,5				
125	140,5				
140	155,5				
160	175,5				
	181				
180	195,5				
	201				
200	221				
220	241				
250	271				
280	304,5				
320	344,5				
360	384,5				
		H8 <sup>2)</sup>	7,75	6,3	0,9
			10,5	8,1	
			7,75	6,3	
			10,5	8,1	
			12,25		

1) Bore diameters in accordance with ISO 3320.

2) See ISO 286-2.

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**Descriptors :** hydraulic fluid power, hydraulic equipment, piston-rods, sealing rings, housings, dimensions.

Price based on 3 pages

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