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Hydraulic fluid power — Dimensions and requirements for screw-to-connect quick-action couplings for use at a pressure of 72 MPa (720 bar)

Transmissions hydrauliques — Dimensions et exigences des raccords rapides de type à visser pour usage à une pression de 72 MPa (720 bar)

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Foreword

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The committee responsible for this document is ISO/TC 131, *Fluid power systems*, Subcommittee SC 4, *Connectors and similar products and components*.

Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit.

Screw-to-connect quick-action couplings conforming to this International Standard are designed to join or separate fluid conductors ensuring, at the same time, sufficient resistance and safety in applications characterized by very high working pressures up to 72 MPa (720 bar).

Hydraulic fluid power — Dimensions and requirements for screw-to-connect quick-action couplings for use at a pressure of 72 MPa (720 bar)

1 Scope

This International Standard specifies dimensional and performance requirements for hydraulic screw-to-connect quick-action couplings designed to be used at pressure of 72 MPa (720 bar[1)]) in static conditions as an interface between a hydraulic power unit and a tool. Typical applications for these couplings are related to hydraulic jacks, rams, clamping devices, hand tools, and cylinders.

This International Standard covers two types of such couplings: the "P" type, which has a poppet valve, and the "S" type, which has a spherical valve.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including amendments) applies.

ISO 725, *ISO inch screw threads — Basic dimensions*

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

ISO 5864, *ISO inch screw threads — Allowances and tolerances*

ISO 7241-2, *Hydraulic fluid power — Quick-action couplings — Part 2: Test methods*

3 Terms and definitions

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

3.1
fluid loss
fluid that exits the coupling when it is disconnected

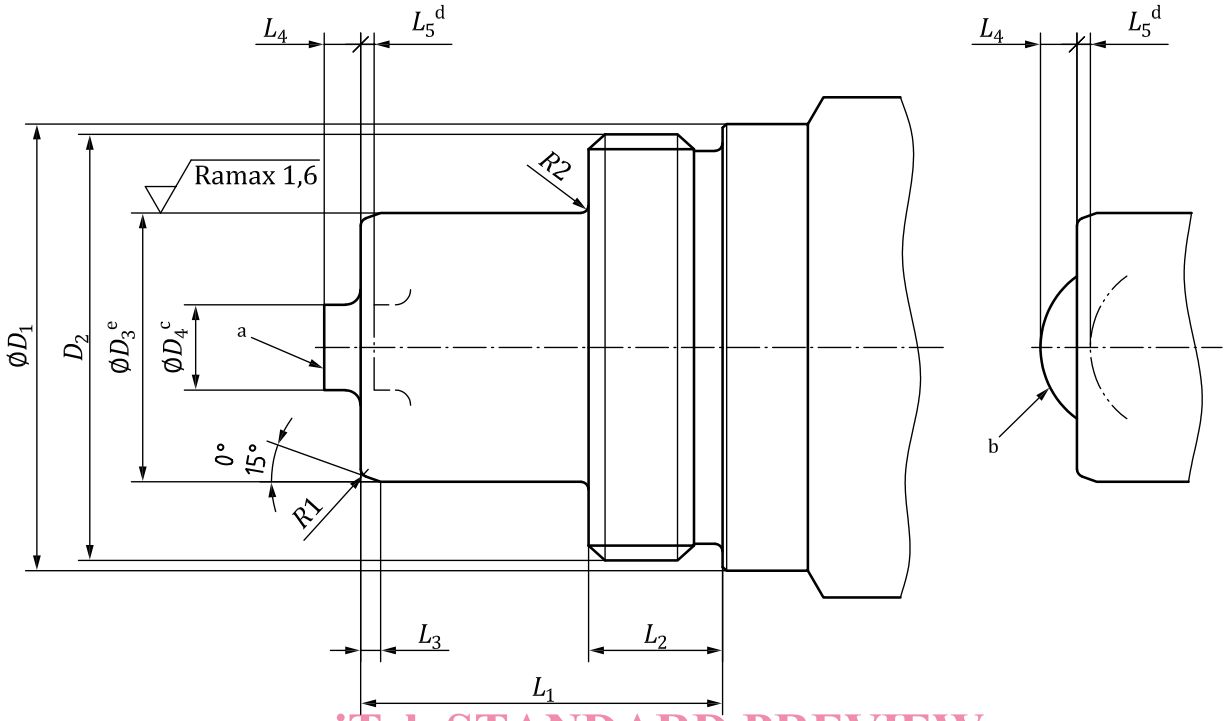
3.2
residual static pressure
static pressure remaining in the circuit without flow

4 Dimensional requirements

Couplings shall conform to the dimensions shown in Figure 1 and given in Table 1.

1) 1 bar = 100 kPa = 10^5 Pa = 0,1 MPa; 1 Pa = 1 N/m^2

Surface roughness values in micrometres



a The shape of the valve is optional; "P" type version (with poppet valve) is shown.

b The shape of the valve is optional; "S" type version (with spherical valve) is shown.

c Use dimension D_4, unless the valve is spherical.

d Maximum valve travel against stop.

e Sealing diameter.

NOTE All dimensions and shape after L_1 and D_1 are left to the manufacturer.

Figure 1 — Dimensional requirements

Table 1 — Dimensional requirements

Dimensions in millimetres

Size a	$ØD_1$	D_2 c	$ØD_3$	$ØD_4$ b	L_1	L_2	L_3	L_4	L_5	$R1$	$R2$
	min			min			max	max	max		max
6,3	26,5	1–18 UNS	15,77 15,85	1,9	18,95 19,15	7,75 7,98	2,0	4	0,4	0,5 1,0	0,6
10	31,5	1-3/16–16 UN	18,96 19,04	2,5	25,32 25,47	9,30 9,52	2,5	4	0,4	0,5 1,3	0,6

a Size designation corresponds to the nominal hose size of the recommended hose; see ISO 4397.

b Use dimension D_4 unless the valve is spherical.

c In accordance with basic dimensions and formulae given in ISO 725 and ISO 5864, tolerance class 2A. See Annex A for the dimensions of the 1-18 UNS thread.

5 Performance requirements

5.1 Couplings conforming to this International Standard shall meet or exceed the performance requirements specified in Table 2.

Table 2 — Performance requirements by coupling size

Performance parameter	Size 6,3 [a]	Size 10 [a]
Working pressure [b]	72 MPa (720 bar)	
Minimum burst pressure (coupled) [c]	216 MPa (2 160 bar)	
Minimum burst pressure for the "P" type (uncoupled) [c]	216 MPa (2 160 bar)	
Minimum burst pressure for the "S" type (uncoupled) [c]	144 MPa (1 440 bar)	
Rated flow [d]	12 l/min	23 l/min
Maximum pressure drop at rated flow [d]	300 kPa (3 bar)	450 kPa (4,5 bar)
Maximum fluid loss per disconnection [e]	0,5 ml	1 ml
Maximum residual static pressure for connection [f]	10 MPa (100 bar)	

[a] Size designation corresponds to the nominal hose size of the recommended hose; see ISO 4397.

[b] See 5.3.

[c] See 5.4.

[d] See 5.5.

[e] See 5.6.

[f] Internal residual static pressure present in one coupling half.

5.2 The performance requirements apply to couplings made from carbon steel. The use of any combination of other materials and the related performance requirements shall be agreed between the customer and manufacturer.

5.3 The working pressure shall be verified in both the coupled and uncoupled conditions by pressure impulse testing for 10 000 cycles at the working pressure (low-cycle fatigue test) using the test pressure wave form specified in ISO 7241-2.

5.4 The burst pressure shall be verified by testing in both the coupled and uncoupled conditions in accordance with ISO 7241-2.

5.5 The pressure drop at rated flow shall be verified by testing in accordance with ISO 7241-2.

5.6 The fluid loss per disconnection shall be verified by testing in accordance with ISO 7241-2.

5.7 The maximum residual static pressure for connection shall be verified by connecting 100 times in accordance with ISO 7241-2 at 10 MPa (100 bar) pressure present in one coupling half only.

6 Best practice

6.1 Manufacturers of couplings conforming to this International Standard shall give proper written information to the customer about safety, correct use, best practice, and maintenance in order to allow correct and safe use of the products.

6.2 Couplings conforming to this International Standard are subject to very high internal pressure. The final user shall always use the most suitable protection devices when using the product and shall keep out of the product's range of action.