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Hydraulic fluid power — Dimensions and requirements for screw-to-connect quick-action couplings for general purpose

Transmissions hydrauliques — Dimensions et exigences des raccords rapides de type à visser pour usage général

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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.

Quick-action couplings, including the screw-to-connect type, are used to join or separate fluid conductors either by hand or the use of a tool.

Hydraulic fluid power — Dimensions and requirements for screw-to-connect quick-action couplings for general purpose

1 Scope

This International Standard specifies the dimensional and performance requirements for hydraulic screw-to-connect quick-action couplings for general use.

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 any amendments) applies.

ISO 724, *ISO General-purpose metric screw threads — Basic dimensions*

ISO 965-1, *ISO General-purpose metric screw threads — Tolerances — Part 1: Principles and basic data*

ISO 1302, *Geometrical Product Specifications (GPS) — Indication of surface texture in technical product documentation*

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

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
male half
part of the coupling with rotating sleeve

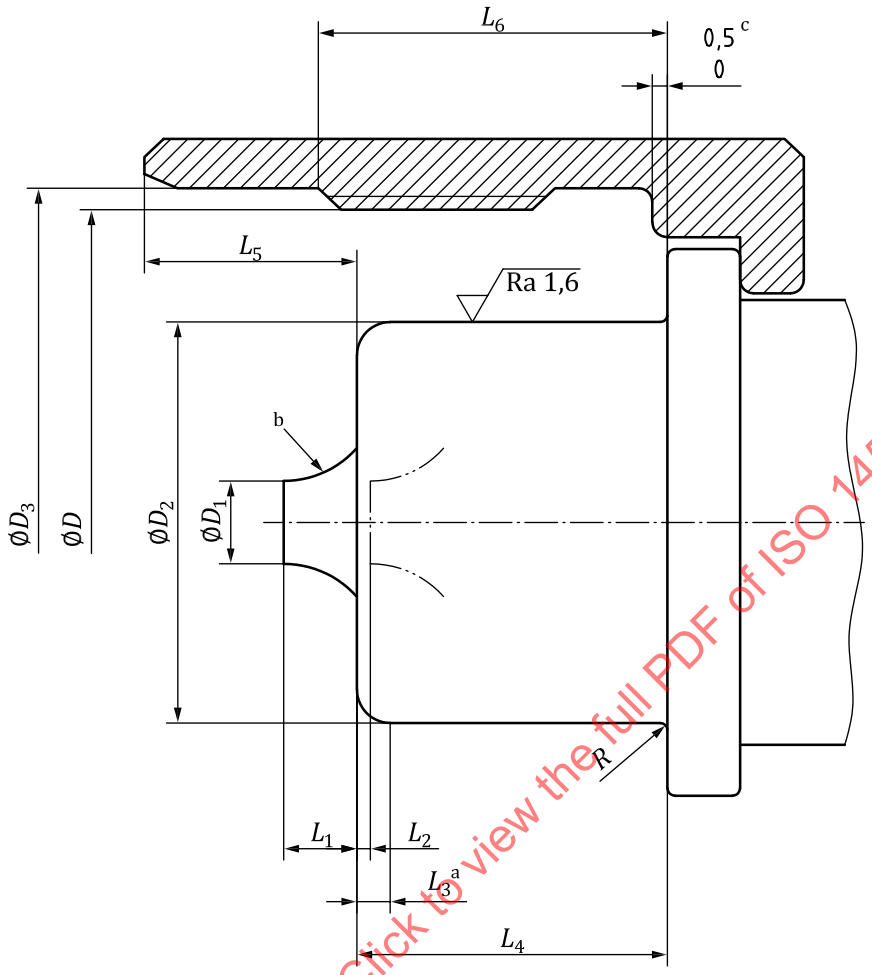
3.3
residual static pressure
static pressure remaining in the circuit without flow

3.4
sleeve
part that connects with female thread

4 Dimensional requirements

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

Surface roughness values in micrometres and in accordance with ISO 1302



a Radius or combined radius-chamfer.

b The valve shape is optional.

c See 4.4.

Figure 1 — Dimensional requirements

Table 1 — Dimensional requirements

Dimensions in millimetres

Coupling size	D a	ΦD_1 min	ΦD_2	ΦD_3	L_1 max	L_2 max	L_3	L_4	L_5 min	L_6 ±0,3	R max
6,3	M24 x 2	2,5	12,85 12,95	24,40 24,50	3,5	0,5	1 1,5	14,65 14,75	11,5	15,2	0,5
10	M28 x 2	3,0	17,35 17,45	28,45 28,55	3,8	0,5	1 2	14,95 15,05	12,1	14,1	0,5
12,5	M36 x 2	4,5	21,90 22,00	36,50 36,70	4,5	0,5	1,5 2,5	16,95 17,05	11,3	16,3	0,5
20	M42 x 2	5,4	27,85 27,95	42,70 42,80	7,5	0,5	1,5 2,5	20,85 21,00	11,0	21,5	0,5

a Thread D conforms to ISO 724; tolerances conform to ISO 965-1, grade 7G.

4.2 The size designation corresponds to the nominal hose size of the hose recommended for use with the coupling; see ISO 4397.

4.3 The shape of the sleeve can be round with wrench flats or hexagonal.

4.4 The female half and the male sleeve should be designed to guarantee relative rotation between the connected halves.

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

Coupling size	Maximum working pressure	Minimum burst pressure		Rated flow rate	Maximum pressure drop at rated flow rate	Rated surge flow rate	Maximum fluid spillage
		Coupled	Uncoupled				
	MPa (bar)[a]	MPa (bar)	MPa (bar)	l/min	kPa (bar)	l/min	ml
6,3	35 (350)	140 (1 400)	140 (1 400)	12	250 (2,5)	36	0,8
10	30 (300)	120 (1 200)	120 (1 200)	23	200 (2)	69	1,4
12,5	30 (300)	120 (1 200)	120 (1 200)	45	150 (1,5)	135	2,7
20	25 (250)	100 (1 000)	100 (1 000)	106	220 (2,2)	318	9,3

[a] 1 bar = 100 kPa = 10^5 Pa = 0,1 MPa; 1 Pa = 1 N/m^2.

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 the manufacturer.

5.3 The maximum working pressure shall be verified by a pressure impulse test conducted in accordance with ISO 7241-2 for 200 000 cycles in the uncoupled condition and 500 000 cycles in the coupled condition. The type, size, and tolerance class of the thread used on the counterpart of the coupling should be recorded in the test report.

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

5.5 The pressure drop at rated flow rate, fluid loss, and surge flow rate capability shall be verified by testing in accordance with ISO 7241-2.

5.6 Couplings shall be designed to be connected at 33 % of the maximum working pressure, which is considered to be the residual working pressure in one coupling half. Couplings shall pass the endurance test specified in ISO 7241-2 by connecting 100 times with an internal pressure of 33 % of the maximum working pressure without any damage to the coupling's functionality.

6 Assembly instruction

6.1 During coupling and uncoupling, torsion of hydraulic hoses shall be avoided. The use of a suitable tool is recommended to provide proper assembly; for example, a wrench or grip can be used to fix one half of the coupling during coupling and uncoupling.