

BS ISO 14541:2013



BSI Standards Publication

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

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**National foreword**

This British Standard is the UK implementation of ISO 14541:2013.

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A list of organizations represented on this committee can be obtained on request to its secretary.

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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

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. [www.iso.org/directives](http://www.iso.org/directives)

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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

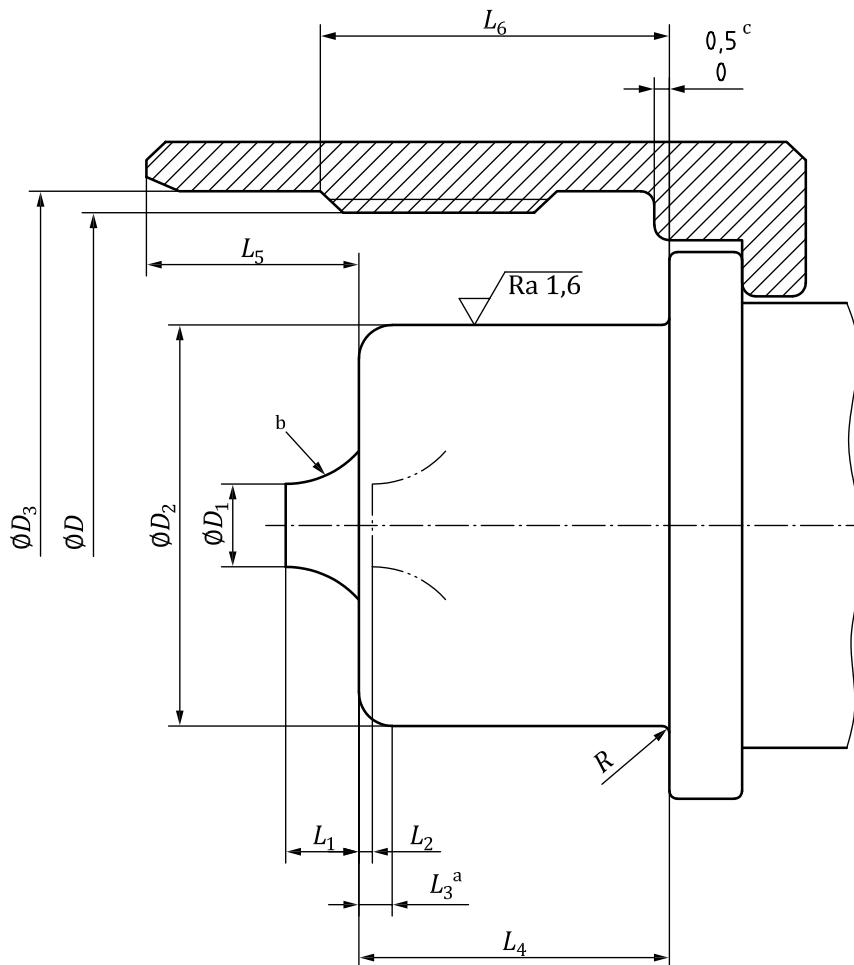
#### **sleeve**

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	$D^a$	$\Phi D_1$ min	$\Phi D_2$	$\Phi D_3$	$L_1$ max	$L_2$ max	$L_3$	$L_4$	$L_5$ min	$L_6$ $\pm 0,3$	$R$ 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

<sup>a</sup> 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) <sup>a</sup>	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

<sup>a</sup> 1 bar = 100 kPa = 10<sup>5</sup> Pa = 0,1 MPa; 1 Pa = 1 N/m<sup>2</sup>.

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.

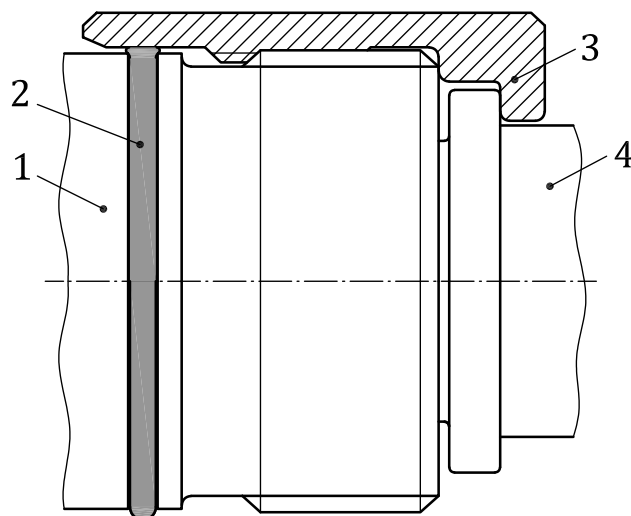
5.5 The pressure drop at rated flow rate, fluid loss, and surge flow rate capability shall be verified by testing in accordance with ISO 7241-2.

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.

6.2 For proper assembly, an optional device — for example, the O-ring shown in [Figure 2](#) — should be used on the female half of the coupling to indicate the final position of the connection.



**Key**

- 1 female half
- 2 O-ring (other device can be used)
- 3 sleeve
- 4 male half

**Figure 2 — Example of an optional device**

## 7 Designation

Hydraulic couplings conforming to this International Standard shall be designated as follows:

- a) the word “Coupling” followed by
- b) a reference to this International Standard (i.e. ISO 14541), followed by a spaced hyphen, followed by
- c) the size.

**EXAMPLE**

A hydraulic quick-action coupling conforming to this International Standard, of size 12,5, is designated as follows:

**Coupling ISO 14541:—, 12,5**

## 8 Marking

Couplings conforming to this International Standard shall be permanently marked at least with the manufacturer’s name, logo, or product identification.

## 9 Identification statement (reference to this International Standard)

The following statement should be used in test reports, catalogues, and sales literature when electing to comply with this International Standard: “Dimensional and performance requirements conform to ISO 14541, *Hydraulic fluid power — Dimensions and requirements for screw-to-connect quick-action couplings for general purpose.*”

## Bibliography

- [1] ISO 4397, *Fluid power connectors and associated components — Nominal outside diameters of tubes and nominal hose sizes*





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