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Hydraulic fluid power — Dimensions and requirements of quick-action couplings

Transmissions hydrauliques — Dimensions et exigences des raccords rapides

ICS: 23.100.40

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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 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee *ISO/TC 131/SC 4 "Connectors and similar products and components"*.

This third edition cancels and replaces the second edition (ISO 7241:2014) which has been technically revised.

The main changes compared to the previous edition are as follows:

— Nominal size designations 20, 40, 50 replaced by 19, 38, 51 according to ISO 4397.

— Impulse pressure test type according to ISO 6803.

— Correction of a mistake in table 7 (two values were inverted).

— Minor graphical updates.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit. Quick-action couplings are used to join or separate fluid conductors quickly and without the use of tools or special devices.

When hydraulic quick-action couplings are used on agricultural machinery, the female coupling half is normally assembled on the tractor and the male coupling half is normally assembled on the tractor attachment.

Hydraulic fluid power — Dimensions and requirements of quick-action couplings

1 Scope

This International Standard specifies the interface dimensions and basic performance requirements for two series of hydraulic quick-action couplings. Both series are in widespread use and have similar technological advantages. Series A is used predominantly in Europe and is preferred worldwide for agricultural and forestry machinery, and this International Standard also specifies additional requirements for Series A for use in agricultural machinery applications covered in ISO 5675. Series B is used predominantly in North America and in the chemical industry.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3448, *Industrial liquid lubricants — ISO viscosity classification*

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

ISO 5675, *Agricultural tractors and machinery — General purpose quick-action hydraulic couplers*

ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method*

ISO 18869, *Hydraulic fluid power — Test methods for couplings actuated with or without tools*

3 Terms and definitions

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

3.1
coupling valve opening force
maximum force required to fully open the hydraulic quick-action coupling valve when the pressure inside the coupling is at zero

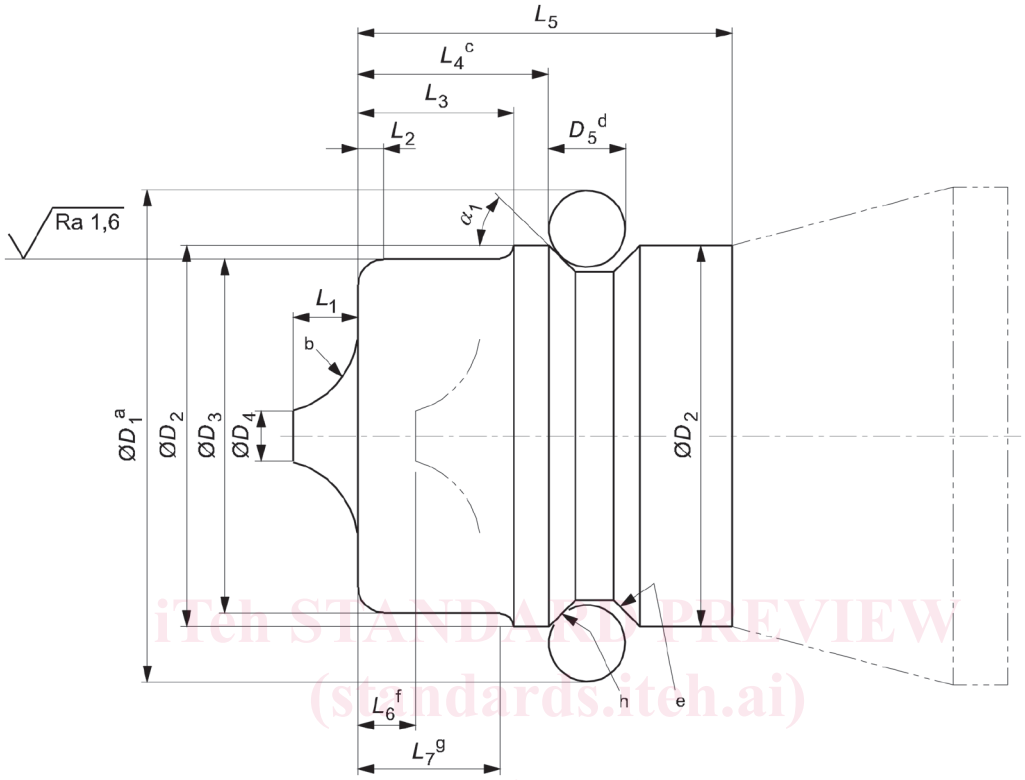
3.2
female half
receptacle portion of a quick-action coupling which normally includes the mechanism to lock the two halves of quick-action coupling together

3.3
interface
that portion of a coupling half that establishes and controls interchangeability

3.4
male half
probe portion of a quick-action coupling which fits and locks into the female half

4 Dimensional requirements

4.1 Dimensional requirements for Series A hydraulic quick-action couplings are shown in Figure 1 and given in Table 1.



a Dimension D_1 is the gauge diameter.

b The shape of the valve is optional, and dimension D_4 is used unless the valve has a spherical form.

c Dimension L_4 is measured to the ball.

d Dimension D_5 is the diameter of the gauge ball.

e The shape of the groove that receives the bearings in the coupled position is left to the manufacturer.

f Maximum valve travel against stop.

g Minimum length of diameter D_3.

h Minimum hardness shall be 86HR 15N at ball contact point. See ISO 6508-1.

i Surface roughness: see ISO 21920-1.

Figure 1 — Dimensional requirements for Series A couplings

Table 1 — Dimensional requirements for Series A couplings

Dimensions in millimetres

Size[a]	D_1	D_2	D_3	D_4[b] min.	D_5 ±0,002 5	L_1 max.	L_2[c]	L_3	L_4	L_5 min.	L_6 max.	L_7 min.	α_1
6,3	18,7	12,9 13	11,73 11,86	1,9	3,968	2,8	0,7 1,5	5,5 5,7	6,6 6,8	14,5	0,5	3,7	44° 46°

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

b Use dimension D_4 unless the valve has a spherical form; spherical form is not preferred.

c Radius or chamfer length. Radius with chamfer is optional.

Table 1 *(continued)*

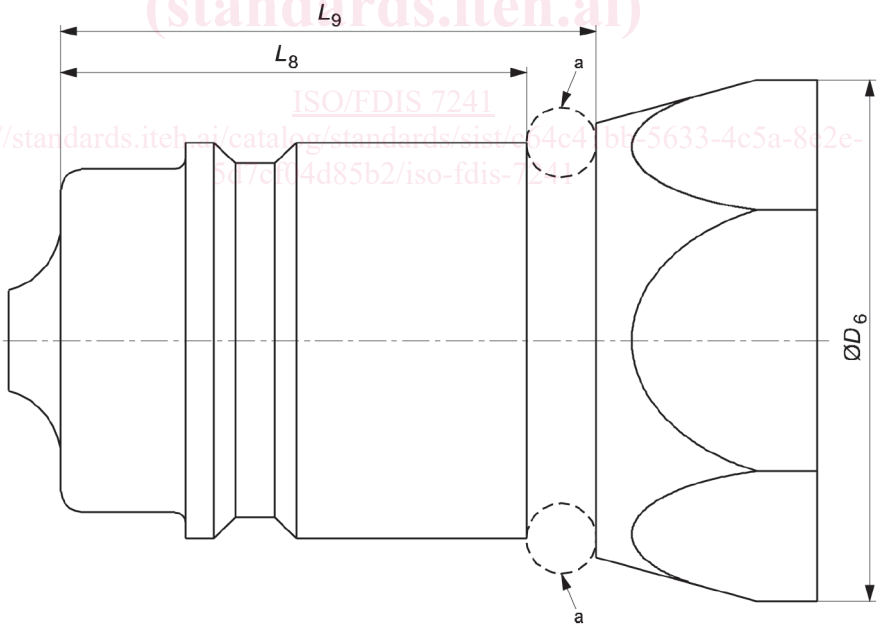
Size[a]	D_1	D_2	D_3	D_4[b] min.	D_5 ±0,002 5	L_1 max.	L_2[c]	L_3	L_4	L_5 min.	L_6 max.	L_7 min.	α_1
10	24,1	18,3 18,4	17,2 17,3	3	3,968	3,8	0,7 1,5	8,8 9	9,8 10	18	0,5	7	
12,5	30,3	23,66 23,74	20,48 20,56	4,5	4,762	4	0,7 1,5	9,2 9,4	11,6 11,8	24	0,5	8	
19	37,1	30,4 30,5	29 29,1	5,4	4,762	7,2	1 2,5	15,9 16,1	17,5 17,7	27,5	0,6	13,7	
25	43,0	36,5 36,6	34,21 34,34	7,8	4,762	8,5	1,5 3	19,7 20	22,8 23	34	0,7	16,3	
31,5	56,0	47,7 47,8	44,9 45	8,9	6	11	2 4,5	24,9 25,1	28,4 28,6	43	0,7	24	
38	68,5	57,5 57,6	54,9 55	9,9	8	13	3 6	30,6 30,8	33,7 33,9	51	0,8	29,6	
51	83,7	69,9 70	65 65,1	9,9	10	16,6	3 7	35 35,2	39,6 39,8	61	0,8	34	

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

[b] Use dimension D_4 unless the valve has a spherical form; spherical form is not preferred.

[c] Radius or chamfer length. Radius with chamfer is optional.

4.2 Additional dimensional requirements for Series A hydraulic quick-action couplings used in agricultural applications are shown in Figure 2 and given in Table 2.



[a] Shape of neck between L_8 and L_9 is optional but shall be circular to accommodate dust sealing.

Figure 2 — Additional dimensional requirements for Series A couplings used in agricultural applications

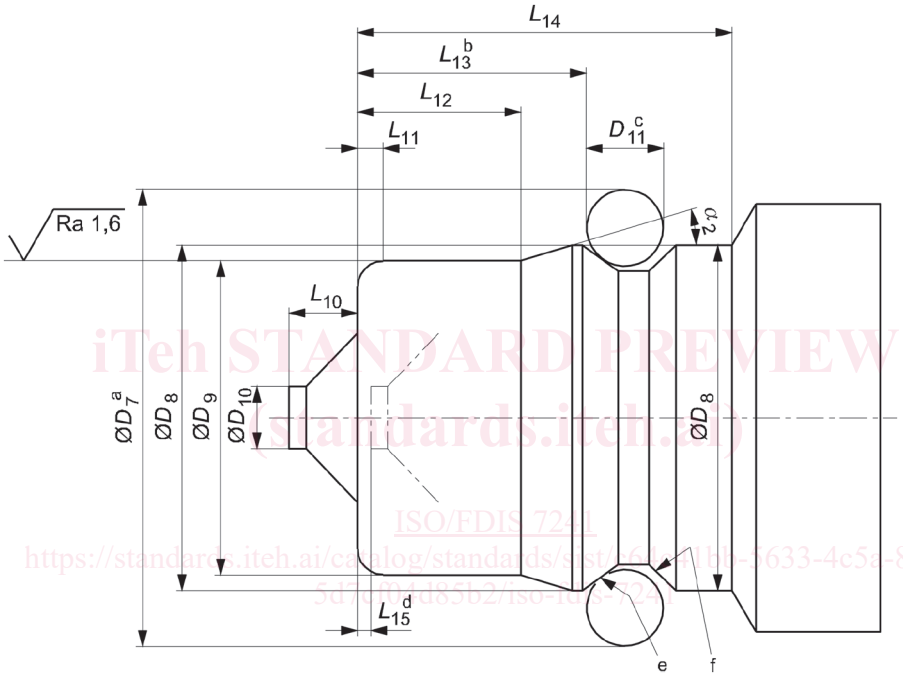
Table 2 — Additional dimensional requirements for Series A couplings used in agricultural applications

Dimensions in millimetres

Size[a]	D_6 max.	L_8 min.	L_9 min.
12,5	31	28,5	32,7
19	38	27,5	—

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

4.3 Dimensional requirements for Series B hydraulic quick-action couplings are shown in Figures 3 and 4, and given in Tables 3 and 4.



[a] Dimension D_7 is the gauge diameter.

[b] Dimension L_{13} is measured to the ball.

[c] Diameter D_{11} is the diameter of the gauge ball.

[d] Valve is flush to minus from end of coupling when against stop.

[e] Minimum hardness shall be 86HR 15N at ball contact point. See ISO 6508-1.

[f] The shape of the groove that receives the bearings in the coupled position is left to the manufacturer.

[g] Surface roughness: see ISO 21920-1.

Figure 3 — Dimensional requirements for Series B couplings — Sizes 5 to 25