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1436

Rubber hoses and hose assemblies — Wire-braid-reinforced hydraulic types for oil-based or water-based fluids — Specification

Tuyaux et flexibles en caoutchouc — Types hydrauliques avec armature de fils métalliques tressés pour fluides à base d'huile ou à base d'eau — Spécifications

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Foreword

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International StandardsThe 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 given inof the ISO/IEC Directives, Part 2 (see www.iso.org/directives.).

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary informationISO 1436 was prepared by Technical Committee

The committee responsible for this document is ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 1, *Rubber and plastics hoses and hose assemblies*.

This fifth edition cancels and replaces the fourth edition (ISO 1436:2009), of which it constitutes a minor revision.

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Rubber hoses and hose assemblies — Wire-braid-reinforced hydraulic types for oil-based or water-based fluids — Specification

1 Scope

This International Standard specifies requirements for six types of wire-braid-reinforced hose and hose assembly of nominal size from 5 to 51 plus, for one of the five types (type R2ATS), nominal size 63. They are suitable for use with water-based hydraulic fluids HFC, HFAE, HFAS and HFB as defined in ISO 6743-4 at temperatures ranging from to ~~−~~–40 °C to ~~+~~+60 °C or oil-based hydraulic fluids HH, HL, HM, HR and HV as defined in ISO 6743-4 at temperatures ranging from ~~−~~–40 °C to ~~+~~+100 °C.

This International Standard does not include requirements for end fittings. It is limited to requirements for hoses and hose assemblies.

NOTE It is the responsibility of the user, in consultation with the hose manufacturer, to establish the compatibility of the hose with the fluid to be used.

2 Normative references

The following documents, in whole or in part, are normatively referenced ~~documents~~in this document and are indispensable for ~~the~~its application ~~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 1307, *Rubber and plastics hoses — Hose sizes, minimum and maximum inside diameters, and tolerances on cut-to-length hoses*

ISO 1402, *Rubber and plastics hoses and hose assemblies — Hydrostatic testing*

ISO 1817, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

ISO 4671, *Rubber and plastics hoses and hose assemblies — Methods of measurement of the dimensions of hoses and the lengths of hose assemblies*

ISO 6605, *Hydraulic fluid power — Hoses and hose assemblies — Test methods*

ISO 6743~~-~~-4, *Lubricants, industrial oils and related products (class L) — Classification — Part 4: Family H (Hydraulic systems)*

ISO 6803, *Rubber or plastics hoses and hose assemblies — Hydraulic-pressure impulse test without flexing*

ISO 7233, *Rubber and plastics hoses and hose assemblies — Determination of resistance to vacuum*

ISO 7326:2006, *Rubber and plastics hoses — Assessment of ozone resistance under static conditions*

ISO 8033:2006, *Rubber and plastics hoses — Determination of adhesion between components*

ISO 8330, *Rubber and plastics hoses and hose assemblies — Vocabulary*

ISO 10619-2, *Rubber and plastics hoses and tubing — measurement — Measurement of flexibility and stiffness — part — Part 2 — bending: Bending tests at sub-ambient temperatures*.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8330 apply.

4 Classification

Six types of hose are specified, distinguished by their construction, working pressure and oil resistance:

— Type 1ST: hoses with a single braid of wire reinforcement and having a thick cover.

— Type 2ST: hoses with two braids of wire reinforcement and having a thick cover.

— Types 1SN and R1ATS: hoses with a single braid of wire reinforcement and having a thin cover.

— Types 2SN and R2ATS: hoses with two braids of wire reinforcement and having a thin cover.

NOTE Types 1SN and R1ATS and types 2SN and R2ATS have the same reinforcement dimensions as type 1ST and type 2ST, respectively, except that they have thinner covers designed to assemble with fittings without removal of the cover or a portion of the cover. SAE J 517, *Hydraulic Hose*, defines a type S as having the same dimensions and construction as the type R1AT and type R2AT which were specified in ISO 1436-1:2001 and ISO 1436-2:2005:2009, but at a higher maximum working pressure. This document uses type R1ATS and type R2ATS to represent these hose types.

5 Materials and construction

5.1 Hoses

Hoses shall consist of a rubber lining resistant to oil- or water-based hydraulic fluids, one or two layers of high-tensile steel wire and a weather- and oil-resistant rubber cover.

5.2 Hose assemblies

Hose assemblies shall be manufactured using hoses conforming to the requirements of this International Standard.

Hose assemblies shall be manufactured only with those hose fittings whose correct functioning has been verified in accordance with Subclauses 7.2, 7.4, 7.5 and 7.6 of this International Standard. The manufacturer's instructions shall be followed for the preparation and fabrication of hose assemblies.

6 Dimensions

6.1 Hose diameters, cover thickness and hose concentricity

When measured in accordance with ISO 4671, the hose diameters and the cover thickness (where appropriate) shall conform to the values given in Table 1.

When measured in accordance with ISO 4671, the concentricity of hoses shall conform to the values given in Table 2.

Table 1 — Dimensions of hoses

Nominal size[a]	All types		Types R1ATS, 1SN, 1ST		Type 1ST		Types 1SN, R1ATS			Types R2ATS, 2SN, 2ST		Type 2ST		Types 2SN, R2ATS		
	Inside diameter ~~Mm~~mm		Diameter over reinforcement mm		Outside diameter of hose mm		Outside diameter of hose mm	Cover thickness mm		Diameter over reinforcement mm		Outside diameter of hose mm		Outside diameter of hose mm	Cover thickness mm	
	min.	max.	min.	max.	min.	max.	max.	min.	max.	min.	max.	min.	max.	max.	min.	max.
5	4,6	5,4	8,9	10,1	11,9	13,5	12,5	0,8	1,5	10,6	11,7	15,1	16,7	14,1	0,8	1,5
6,3	6,1	7,0	10,6	11,7	15,1	16,7	14,1	0,8	1,5	12,1	13,3	16,7	18,3	15,7	0,8	1,5
8	7,7	8,5	12,1	13,3	16,7	18,3	15,7	0,8	1,5	13,7	14,9	18,3	19,9	17,3	0,8	1,5
10	9,3	10,1	14,5	15,7	19,0	20,6	18,1	0,8	1,5	16,1	17,3	20,6	22,2	19,7	0,8	1,5
12,5	12,3	13,5	17,5	19,1	22,2	23,8	21,5	0,8	1,5	19,0	20,6	23,8	25,4	23,1	0,8	1,5
16	15,5	16,7	20,6	22,2	25,4	27,0	24,7	0,8	1,5	22,2	23,8	27,0	28,6	26,3	0,8	1,5
19	18,6	19,8	24,6	26,2	29,4	31,0	28,6	0,8	1,5	26,2	27,8	31,0	32,6	30,2	0,8	1,5
25	25,0	26,4	32,5	34,1	36,9	39,3	36,6	0,8	1,5	34,1	35,7	38,5	40,9	38,9	0,8	1,5
31,5	31,4	33,0	39,3	41,7	44,4	47,6	44,8	1,0	2,0	43,2	45,7	49,2	52,4	49,6	1,0	2,0
38	37,7	39,3	45,6	48,0	50,8	54,0	52,1	1,3	2,5	49,6	52,0	55,6	58,8	56,0	1,3	2,5
51	50,4	52,0	58,7	61,9	65,1	68,3	65,9	1,3	2,5	62,3	64,7	68,2	71,4	68,6	1,3	2,5
63[b]	63,1	65,1								74,6	77,8			81,8	1,3	2,5

[a] The nominal sizes correspond to those given in ISO 1307.

[b] This nominal size is for type R2ATS only.

Table 2 — Concentricity of hoses

Nominal size	Maximum variation in wall thickness mm		
	Between inside diameter and outside diameter	Between inside diameter and reinforcement outside diameter	
	All types	Types 1ST, 1SN and R1ATS	Types 2ST, 2SN and R2ATS
Up to and including 6,3	0,8	0,4	0,5
Greater than 6,3 and up to and including 19	1,0	0,6	0,7
Greater than 19	1,3	0,8	0,9

6.2 Length

The length of supplied hoses and hose assemblies shall be the subject of agreement between the manufacturer and the purchaser.

NOTE Recommendations for supplied lengths of hoses and hose assemblies are given in Annex C.

7 Performance requirements

7.1 General

The requirements for type and routine testing are given in Annex A and recommendations for production acceptance testing in Annex B.

7.2 Hydrostatic requirements

When determined in accordance with ISO 1402 or ISO 6605, the proof pressure and the minimum burst pressure of hoses and hose assemblies shall conform to the values given in Table 3.

When determined in accordance with ISO 1402 or ISO 6605, the change in length of hoses at the maximum working pressure shall not exceed +2 % or −4 %.

Table 3 — Maximum working pressure, proof pressure and minimum burst pressure

Nominal size	Maximum working pressure		Proof pressure		Minimum burst pressure	
	Types 1ST, 1SN and R1ATS	Types 2ST, 2SN and R2ATS	Types 1ST, 1SN and R1ATS	Types 2ST, 2SN and R2ATS	Types 1ST, 1SN and R1ATS	Types 2ST, 2SN and R2ATS
	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)	MPa (bar)
5	25,0 (250)	41,5 (415)	50,0 (500)	83,0 (830)	100,0 (1 000)	166,0 (1 660)
6	22,5 (225)	40,0 (400)	45,0 (450)	80,0 (800)	90,0 (900)	160,0 (1 600)
8	21,5 (215)	35,0 (350)	43,0 (430)	70,0 (700)	86,0 (860)	140,0 (1 400)
10	18,0 (180)	33,0 (330)	36,0 (360)	66,0 (660)	72,0 (720)	132,0 (1 320)
12,5	16,0 (160)	27,5 (275)	32,0 (320)	55,0 (550)	64,0 (640)	110,0 (1 100)