# INTERNATIONAL STANDARD

Third edition 2009-05-01

## Rubber hoses and hose assemblies — Rubber-covered spiral-wire-reinforced hydraulic types for oil-based or waterbased fluids — Specification

Tuyaux et flexibles en caoutchouc — Types hydrauliques avec armature hélicoïdale de fils métalliques pour fluides à base d'huile ou à **iTeh ST**base d'eau — Spécifications VIEW

## (standards.iteh.ai)

ISO 3862:2009 https://standards.iteh.ai/catalog/standards/sist/1c69b21a-c66f-4c8b-800bca21c824b52e/iso-3862-2009



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 3862 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 1, *Hoses (rubber and plastics)*.

This third edition of ISO 3862 cancels and replaces ISO 3862-1:2001 and ISO 3862-2:2005, which have been technically revised and combined in a single document. The main changes are as follows:

- pressures are now given in megapascals as the preferred unit;
- the requirement for an abrasion test has been deleted.
- ISO 4397 has been replaced by ISO 1307.

## Rubber hoses and hose assemblies — Rubber-covered spiralwire-reinforced hydraulic types for oil-based or water-based fluids — Specification

#### 1 Scope

This International Standard specifies requirements for five types of spiral-wire-reinforced hydraulic hose and hose assembly of nominal size from 6,3 to 51. 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 -40 °C to +60 °C and 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 for types 4SP and 4SH and -40 °C to +120 °C for types R12, R13 and R15.

NOTE 1 This temperature rating is related to the water-based hydraulic fluids defined in ISO 6743-4.

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

NOTE 2 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. (Standards.iten.al)

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#### 2 Normative references ds.iteh.ai/catalog/standards/sist/1c69b21a-c66f-4c8b-800b-

ca21c824b52e/iso-3862-2009

The following referenced documents are indispensable for the 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 — 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 4672:1997, Rubber and plastics hoses — Sub-ambient temperature flexibility tests<sup>1</sup>)

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

<sup>1)</sup> Under revision as ISO 10619-2.

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

#### 3 Terms and definitions

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

#### 4 Classification

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

- Type 4SP: medium-pressure hoses with four plies of steel wire spiral.
- Type 4SH: high-pressure hoses with four plies of steel wire spiral.
- Type R12: heavy-duty high-temperature hoses with a medium-pressure rating having four plies of steel wire spiral.
- Type R13: heavy-duty high-temperature hoses with a high-pressure rating having a multiple-steel-wire spiral.
- Type R15: heavy-duty high-temperature hoses with an extra-high-pressure rating having a multiple-steelwire spiral.

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5 Materials and construction

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#### 5.1 Hoses

Hoses shall consist of a rubber lining resistant to oil- or water-based hydraulic fluids, spiral plies of steel wire wrapped in alternating directions, and an oil- and weather-resistant rubber cover. Each spiral wire ply shall be separated by an insulating layer.

#### 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 and hose concentricity

When measured in accordance with ISO 4671, the inside diameter of hoses shall conform to the values given in Table 1.

When measured in accordance with ISO 4671, the diameter over reinforcement and outside diameter of hoses shall conform to the values given in Table 2.

When measured in accordance with ISO 4671, the concentricity of hoses shall conform to the values given in Table 3.

	Inside diameter													
Nominal	mm													
size	Тур	e 4SP	Туре	4SH	Туре	R12	Туре	R13	Type R15					
	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.				
6,3	6,2	7,0	—	_	_	_	_	_	—	_				
10	9,3	10,1	—	_	9,3	10,1	—	—	9,3	10,1				
12,5	12,3	13,5	—	—	12,3	13,5	—	—	12,3	13,5				
16	15,5	16,7	—	—	15,5	16,7	—	—	—	—				
19	18,6	19,8	18,6	19,8	18,6	19,8	18,6	19,8	18,6	19,8				
25	25,0	26,4	25,0	26,4	25,0	26,4	25,0	26,4	25,0	26,4				
31,5	31,4	33,0	31,4	33,0	31,4	33,0	31,4	33,0	31,4	33,0				
38	37,7	39,3	37,7	39,3	37,7	39,3	37,7	39,3	37,7	39,3				
51	50,4	52,0	50,4	52,0	50,4	52,0	50,4	52,0	—	_				
			(ctor	ndard	c itoh	ai								

Table 1 — Inside diameters of hoses

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	Ŧ		.:		~	~			Ć	10	6			1											
Type R15	Outside diameter o hose	mm	max		23,5	26,8		36,1	42,5	51,5	59,6														
			min.		I	I	I	I	I	I	I	I													
	er over cement	m	тах.		20,3	24,0		32,9	38,9	48,4	56,3	I													
	Diamet	٤	min.				I					I													
	tside eter of ose	ster of se m	max.		I	I	I	33,2	39,8	51,3	58,8	72,7													
R13	Ou <sup>r</sup> diam ho	C	min.				I	31,0	37,6	48,3	55,8	69,5													
Type I	ter over rcement	шu	max.	-				29,8	36,4	48,0	55,5	69,3													
	Diame reinfo	L	min.	I	I	I	I	28,2	34,9	45,6	53,1	66,9													
	side eter of se	E	тах.	-	21,0	24,6	28,2	31,7	39,4	48,6	55,0	68,3													
12	Out diame	'eh	din 1	T.	1 <u>9</u> .5	23,0	26,6	29,9	36,8	45,4	51,9	65,1	<b>I</b>	$\mathbf{W}$											
Type F	er over cement	m	max.	st	17,8	21,5	25,4	<b>2</b> 8, <b>2</b> 5	36,0	45, <b>b</b>	51,6	64,8													
	Diamet reinfor	E tanda	urda.i E	teh.a	i∕œta ϣl o	1 <u>0</u> 102/9 28 <del>2</del> 4	steend b	12.2 12 2/20-	/sist/ -386	1069 2₽20	)( <del>3</del> )( <del>3</del>	62 <mark>%</mark>	6f-4c	8b-800b											
	ide ter of	ш	тах.		I	I	I	33,0	39,9	47,1	55,1	69,7													
4SH	Outs diame ho	E	min.				I	31,4	37,5	43,9	51,9	66,5													
Type	ter over cement	E	тах.	I	I	I	I	29,2	36,0	42,9	49,8	64,2	07.												
	Diame	E	min.	I	I	I	Ι	27,6	34,4	40,9	47,8	62,2	in ISO 13												
Type 4SP	Outside diameter of hose	mm	F	F	E	E	E	Ē	Ē	Ē	E	E	ш	тах.	18,7	22,2	25,4	29,0	33,0	40,9	52,4	58,8	71,4	se given i	
			min.	17,1	20,6	23,8	27,4	31,4	38,5	49,2	55,6	68,2	nd to tho:												
	Diameter over reinforcement	Ľ	тах.	15,3	18,1	21,0	24,6	29,0	36,1	47,0	53,4	66,3	correspo												
		um	min.	14,1	16,9	19,4	23,0	27,4	34,5	45,0	51,4	64,3	ninal sizes												
	Nominal size <sup>a</sup>			6,3	10	12,5	16	19	25	31,5	38	51	a The nor												

Table 2 — Diameter over reinforcement and outside diameter

	Maximum variation in wall thickness								
Nominal size	mm								
	Between inside diameter and outside diameter	Between inside diameter and reinforcement diameter							
6,3	0,8	0,5							
Over 6,3 and up to and including 19	1,0	0,7							
Over 19	1,3	0,9							

#### Table 3 — Concentricity of hoses

#### 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

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#### 7.1 General

### (standards.iteh.ai)

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

https://standards.iteh.ai/catalog/standards/sist/1c69b21a-c66f-4c8b-800b-7.2 Hydrostatic requirements ca21c824b52e/iso-3862-2009

**7.2.1** When tested in accordance with ISO 1402 or ISO 6605 at the relevant proof pressure given in Table 4 and the relevant minimum burst pressure given in Table 5, the hoses and hose assemblies shall not leak.

**7.2.2** When determined in accordance with ISO 1402 or ISO 6605, the change in length of hoses at the maximum working pressure (see Table 6) shall not exceed +2% or -4% for types 4SP and 4SH, or +2% or -2% for types R12, R13 and R15.