



SLOVENSKI STANDARD

SIST EN 856:2000

01-december-2000

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Rubber hoses and hose assemblies - Rubber-covered spiral wire reinforced hydraulic type - Specification

Gummischläuche und -schlauchleitungen - Hydraulikschläuche mit Drahtspiraleinlage - Spezifikation

ITeH STANDARD PREVIEW

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Tuyaux et flexibles en caoutchouc - Type Hydraulique avec armature hélicoïdale de fils métalliques - Spécification

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EUROPEAN STANDARD

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English version

**Rubber hoses and hose assemblies -
Rubber-covered spiral wire reinforced hydraulic
type - Specification**

Tuyaux et flexibles en caoutchouc - Type
hydraulique avec armature hélicoïdale de fils
métalliques - Spécification

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PREVZET PO METODI RAZGLASITVE

-12- 2000

This European Standard was approved by CEN on 1996-09-19. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 218 "Rubber and plastics hoses and hose assemblies", the secretariat of which is held by BSI.

This standard is based on ISO 3862.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 1997, and conflicting national standards shall be withdrawn at the latest by April 1997.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies requirements for four types of rubber covered spiral wire reinforced hydraulic hoses and hose assemblies of nominal bore from 6 to 51. They are suitable for use with :

- hydraulic fluids in accordance with ISO 6743-4 with the exception of HFD R, HFD S and HFD T at temperatures ranging from - 40 °C to + 100 °C for types 4SP and 4SH and -40 °C to +120 °C for types R12 and R13;
- water based fluids at temperatures ranging from -40 °C to 70 °C.
- water fluids at temperatures ranging from 0 °C to +70 °C.

The Standard does not include requirements for end fittings. It is limited to the performance of hoses and hose assemblies.

NOTE 1: The hoses are not suitable for use with castor oil based nor ester based fluids.

NOTE 2: Hoses and hose assemblies should not be operated outside the limits of this standard.

NOTE 3: Requirements for hydraulic hoses for underground mining are standardised in separate standard

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision.

For undated references the latest edition of the publication referred to applies.

- EN 24671 Rubber and plastics hose and hose assemblies - Methods of measurement of dimensions (ISO 4671:1984)
- EN 24672 Rubber and plastics hoses - Sub-ambient temperature flexibility tests (ISO 4672:1988)
- EN 27326 Rubber and plastics hoses - Assessment of ozone resistance under static conditions (ISO 7326:1991)
- EN 28033:1993 Rubber and plastics hose - Determination of adhesion between components (ISO 8033:1991)
- EN ISO 1402 Rubber and plastics hoses and hose assemblies - Hydrostatic testing (ISO 1402:1994)
- EN ISO 6945 Rubber hoses - Determination of abrasion resistance of the outer cover (ISO 6945:1991)
- ISO 1817 Rubber, vulcanized - Determination of the effect of liquids
- ISO 6743-4 Lubricants, industrial oils and related products (Class L) - Classification - Part 4 : Family H (Hydraulic systems)
- ISO 6803 Rubber and plastics hoses and hose assemblies - Hydraulic pressure impulse test without flexing

3 Types of hose

Four types of hose are specified:

- Type 4SP - a 4-steel wire spiral medium pressure hoses;
- Type 4SH - a 4-steel wire spiral extra high pressure hoses;
- Type R12 - a 4-steel wire spiral heavy duty high temperature hoses - medium pressure rating;
- Type R13 - a multiple steel wire spiral heavy duty high temperature hoses - high pressure rating.

4 Materials and construction

4.1 Hoses

Hoses shall consist of an oil and water resistant synthetic rubber lining, spiral plies of steel wire wrapped in alternating directions, and an oil and weather resistant synthetic rubber cover. Each spiral wire ply shall be separated by an insulating layer of synthetic rubber.

4.2 Hose assemblies

Hose assemblies shall only be manufactured with those hose fittings whose functionality has been verified in all tests in accordance with this standard.

5 Dimensions

5.1 Diameters and concentricity

When measured in accordance with EN 24671, the diameters of the hoses shall comply with the values given in table 1.

Table 1: Diameters of hoses

Dimensions in millimetres

Nominal bore	Internal diameter							
	Type 4SP		Type 4SH		Type R12		Type R13	
	min.	max.	min.	max.	min.	max.	min.	max.
6	6,2	7,0	-	-	-	-	-	-
10	9,3	10,1	-	-	9,3	10,1	-	-
12	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
25	25,0	26,4	25,0	26,4	25,0	26,4	25,0	26,4
31	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
51	50,4	52,0	50,4	52,0	50,4	52,0	50,4	52,0

When measured in accordance with EN 24671, the diameter over reinforcement and outside diameter of the hoses shall comply with the values given in table 2.

Table 2: Diameter over reinforcement and outside diameter

Dimensions in millimetres

Nominal bore	Type 4SP				Type 4SH				Type R12				Type R13			
	Diameter over reinforcement		Outside diameter of hose		Diameter over reinforcement		Outside diameter of hose		Diameter over reinforcement		Outside diameter of hose		Diameter over reinforcement		Outside diameter of hose	
	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
6	14,1	15,3	17,1	18,7	-	-	-	-	-	-	-	-	-	-	-	-
10	16,9	18,1	20,6	22,2	-	-	-	-	16,6	17,8	19,5	21,0	-	-	-	-
12	19,4	21,0	23,8	25,4	-	-	-	-	19,9	21,5	23,0	24,6	-	-	-	-
16	23,0	24,6	27,4	29,0	-	-	-	-	23,8	25,4	26,6	28,8	-	-	-	-
19	27,4	29,0	31,4	33,0	27,6	29,2	31,4	33,0	26,9	28,4	29,9	31,5	28,2	29,8	31,0	33,2
25	34,5	36,1	38,5	40,9	34,4	36,0	37,5	39,9	34,1	35,7	36,8	39,2	34,9	36,4	37,6	39,8
31	45,0	47,0	49,2	52,4	40,9	42,9	43,9	47,1	42,7	45,1	45,4	48,6	45,6	48,0	48,3	51,3
38	51,4	53,4	55,6	58,8	47,8	49,8	51,9	55,1	49,2	51,6	51,9	55,0	53,1	55,5	55,8	58,8
51	64,3	66,3	68,2	71,4	62,2	64,2	66,5	69,7	62,5	64,8	65,1	68,3	66,9	69,3	69,5	72,7

When measured in accordance with EN 24671, the concentricity of the hoses shall comply with the values given in table 3.

Table 3: Concentricity of hoses

Dimensions in millimetres

Nominal bore	Maximum variation in wall thickness	
	Between internal diameter and outside diameter	Between internal diameter and reinforcement diameter
6	0,8	0,5
Over 6 and including 19	1,0	0,7
Over 19	1,3	0,9

5.2 Length

5.2.1 Hoses

Hoses shall be supplied in lengths as specified by the purchaser, subject to a tolerance on the specified lengths of $\pm 2\%$.

When no specific hose lengths have been ordered, the percentages of different lengths in any given delivery shall be as follows:

- over 20 m : not less than 80 % of total length;
- over 10 m to 20 m : not more than 20 % of total length;
- 1 m to 10 m : not more than 3 % of total length.

No hose length shall be less than 1 m.

5.2.2 Hose assemblies

The tolerances on the length of hose assemblies shall comply with the values given in table 4.

Table 4: Tolerances of length of hose assemblies

Dimensions in millimetres

Hose assembly length	Nominal bore	
	Up to and including 25	Over 25
Up to and including 630	+ 7 - 3	+ 12 - 4
Over 630 and including 1250	+ 12 - 4	+ 20 - 6
Over 1250 and including 2500	+ 20 - 6	+ 25 - 6
Over 2500 and including 8000	+ 1,5 % - 0,5 %	
Over 8000	+ 3 % - 1 %	

6 Requirements

6.1 Hydrostatic requirements

6.1.1 When tested in accordance with EN ISO 1402, the maximum working pressure, the proof pressure and burst pressure of the hoses and hose assemblies shall comply with the values given in table 5.

Table 5: Maximum working pressure, proof pressure and burst pressure

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Nominal bore	Maximum working pressure bar ¹⁾				Proof pressure bar				Burst pressure bar			
	Type				Type				Type			
	4SP	4SH	R12	R13	4SP	4SH	R12	R13	4SP	4SH	R12	R13
6	450	-	-	-	900	-	-	-	1800	-	-	-
10	445	-	276	-	890	-	552	-	1780	-	1104	-
12	415	-	276	-	830	-	552	-	1660	-	1104	-
16	350	-	276	-	700	-	552	-	1400	-	1104	-
19	350	420	276	345	700	840	552	690	1400	1680	1104	1380
25	280	380	276	345	560	760	552	690	1120	1520	1104	1380
31	210	325	207	345	420	650	414	690	840	1300	828	1380
38	185	290	172	345	370	580	344	690	740	1160	688	1380
51	165	250	172	345	330	500	344	690	660	1000	688	1380

¹⁾ 1 bar = 0,1 MPa