



SLOVENSKI STANDARD

SIST EN 854:2015

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Nadomešča:
SIST EN 854:2000

Gumene cevi in cevni priključki - S tekstilom ojačene hidravlične cevi - Specifikacija

Rubber hoses and hose assemblies - Textile reinforced hydraulic type - Specification

Gummischläuche und -schlauchleitungen - Hydraulikschläuche mit Textileinlage -
Spezifikation

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Tuyaux et flexibles en caoutchouc - Type hydraulique avec armature de textile -
Spécification

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EUROPEAN STANDARD

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Rubber hoses and hose assemblies - Textile reinforced hydraulic type - Specification

Tuyaux et flexibles en caoutchouc - Type hydraulique avec armature de textile - Spécification

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This European Standard was approved by CEN on 31 January 2015.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 854:2015) 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 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of an identical text or by endorsement, at the latest by October 2015 and conflicting national standards shall be withdrawn at the latest by October 2015.

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

This document supersedes EN 854:1996.

In comparison with EN 854:1996, the following significant changes have been made:

- updated normative references;
- tolerances for inside diameter in Table 1;
- deleted types R6 and R3;
- added Annex A;
- added Annex B;
- added Annex C.

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According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 854:2015 (E)**1 Scope**

This European Standard specifies requirements for three types of textile reinforced rubber hoses and hose assemblies of nominal bore from 5 to 100. The types are defined in Clause 3.

They are suitable for use with:

- hydraulic fluids in accordance with ISO 6743-4 with the exception of HRD R, HFD S and HFD at temperatures ranging from -40 °C to 100 °C;
- water-based fluids at temperatures ranging from -40 °C to +70 °C;
- water at temperature ranging from 0 °C to +70 °C.

The European 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 and ester based fluids.

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

NOTE 3 Requirements for hydraulic hoses for underground mining are standardized in separate standards.

2 Normative references

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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.

EN ISO 1302, *Geometrical Product Specifications (GPS) - Indication of surface texture in technical product documentation (ISO 1302)*

EN ISO 1402:2009, *Rubber and plastics hoses and hose assemblies - Hydrostatic testing (ISO 1402:2009)*

EN ISO 4671, *Rubber and plastics hoses and hose assemblies - Methods of measurement of the dimensions of hoses and the lengths of hose assemblies (ISO 4671)*

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

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

EN ISO 7233, *Rubber and plastics hoses and hose assemblies - Determination of resistance to vacuum (ISO 7233)*

EN ISO 7326, *Rubber and plastics hoses - Assessment of ozone resistance under static conditions (ISO 7326)*

EN ISO 8033:2006, *Rubber and plastics hoses - Determination of adhesion between components (ISO 8033:2006)*

EN ISO 10619-2, *Rubber and plastics hoses and tubing - Measurement of flexibility and stiffness - Part 2: Bending tests at sub-ambient temperatures (ISO 10619-2)*

ISO 1817:2005, *Rubber, vulcanized - Determination of the effect of liquids*

ISO 23529, *Rubber - General procedures for preparing and conditioning test pieces for physical test methods*

3 Classification

Three types of hose are specified, distinguished by their construction, maximum working pressure and minimum bend radius

- Type 1TE: hoses with a single layer of textile reinforcement;
- Type 2TE: hoses with one or more braid(s) of textile reinforcement;
- Type 3TE: hoses with one or more braid(s) of textile reinforcement (higher maximum working pressure).

NOTE Hose Types 1TE are used or low pressure applications therefore they are not subjected to impulse test and vacuum resistance test.

4 Materials and construction

4.1 Hoses

Hoses shall consist of an oil and water resistant synthetic rubber lining, one or more layers of textile yarn and an oil and weather resistant synthetic rubber cover.

4.2 Hose assemblies

Hose assemblies shall only be manufactured with those hose fittings whose functionality has been verified in accordance with subclauses 6.1, 6.3, 6.4 and 6.5 of this European Standard.

5 Dimensions

5.1 Diameters and concentricity

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

Table 1 — Diameters of hoses

Dimensions in millimetres except nominal bore

Nominal bore	Inside diameter		Outside diameter of hoses					
	All types		Type 1TE		Type 2TE		Type 3TE	
	min.	max.	min.	max.	min.	max.	min.	max.
5	4,9	5,2	10,0	11,6	11,0	12,6	12,0	13,6
6	6,4	6,9	11,6	13,2	12,6	14,2	13,6	15,2
8	7,9	8,4	13,1	14,7	14,1	15,7	16,1	17,7
10	9,5	10,0	14,7	16,3	15,7	17,3	17,7	19,3
12	12,7	13,3	17,7	19,7	18,7	20,7	20,7	22,7
16	15,8	16,5	21,9	23,9	22,9	24,9	24,9	26,9
19	18,8	19,8	-	-	26,0	28,0	28,0	30,0
25	25,4	26,2	-	-	32,9	35,9	34,4	37,4
31	31,8	32,8	-	-	-	-	40,8	43,8
38	38,1	39,1	-	-	-	-	47,6	51,6
51	50,6	51,8	-	-	-	-	60,3	64,3
60	59,6	61,2	-	-	-	-	70,0	74,0
80	79,6	81,2	-	-	-	-	91,5	96,5
100	99,4	101,4	-	-	-	-	113,5	118,5

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

Table 2 — Concentricity of hoses

Dimensions in millimetres, except nominal bore

Nominal bore	Maximum variation in wall
	Between inside diameter and outside diameter
Up to and including 6	0,8
Over 6 and including 25	1,0
Over 25	1,3

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.

The length of hose shall be at least 1 m.

5.2.2 Hose assemblies

The tolerances on the length of hose assemblies shall conform to Table 3.

Table 3 — Tolerances of length of hose assemblies

Hose assembly length mm	Nominal bore		
	Up to and including 25	Over 25 and including 50	Over 50
	Tolerance	Tolerance	Tolerance
Up to and including 630	+ 7 mm - 3 mm	+ 12 mm - 4 mm	+ 25 mm - 6 mm
Over 630 and including 1 250	+ 12 mm - 4 mm	+ 20 mm - 6 mm	
Over 1 250 and including 2 500	+ 20 mm - 6 mm	+ 25 mm - 6 mm	
Over 2 500 and including 8 000	+ 1,5 % - 0,5 %		
Over 8 000	+ 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 conform to the values given in Table 4.

Table 4 — Maximum working pressure, proof pressure and burst pressure

Nominal bore	Maximum working pressure bar ^a			Proof-pressure bar			Burst-pressure bar		
	Type			Type			Type		
	1TE	2TE	3TE	1TE	2TE	3TE	1TE	2TE	3TE
5	25	80	160	50	160	320	100	320	640
6	25	75	145	50	150	290	100	300	580
8	20	68	130	40	136	260	80	272	520
10	20	63	110	40	126	220	80	252	440
12	16	58	93	32	116	186	64	232	372
16	16	50	80	32	100	160	64	200	320
19	-	45	70	-	90	140	-	180	280
25	-	40	55	-	80	110	-	160	220
31	-	-	45	-	-	90	-	-	180
38	-	-	40	-	-	80	-	-	160
51	-	-	33	-	-	66	-	-	132
60	-	-	25	-	-	50	-	-	100
80	-	-	18	-	-	36	-	-	72
100	-	-	10	-	-	20	-	-	40

^a 1 bar = 0,1 MPa.

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6.1.2 When tested in accordance with EN ISO 1402, the change in length of hose at the maximum working pressure shall not exceed + 2 % to - 4 % up to and including nominal bore 31 and 0 % to + 5 % above nominal bore 31.

6.2 Minimum bend radius

When bent to the minimum bend radius given in Table 5 measured on the inside of the bend, the flatness shall not exceed 10 % of the original outside diameter.

Measure the hose outside diameter with a calliper before bending the hose. Bend the hose to the minimum bend radius and measure the flatness with the calliper.

Table 5 — Minimum bend radius

Nominal bore	Minimum bend radius mm		
	Type 1TE	Type 2TE	Type 3TE
5	35	35	40
6	45	40	45
8	65	50	55
10	75	60	70
12	90	70	85
16	115	90	105
19	-	110	130
25	-	150	150
31	-	-	190
38	-	-	240
51	-	-	300
60	-	-	400
80	-	-	500
100	-	-	600

6.3 Impulse test requirements

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(Not applicable to type 1TE hoses.)

6.3.1 The impulse test shall be in accordance with EN ISO 6803. The test temperature shall be 100 °C.

6.3.2 For type 2TE hoses, when tested at impulse pressure equal to 125 % of the maximum working pressure, the hose shall withstand a minimum of 100 000 impulse cycles.

For type 3TE hoses, when tested at impulse pressure equal to 133 % of the maximum working pressure for hoses of nominal bore up to and including 25 and at 100 % of the maximum working pressure for nominal bore above 25, the hose shall withstand a minimum of 200 000 impulse cycles.

6.3.3 There shall be no leakage or other malfunction before reaching the specified number of cycles.

6.3.4 This test shall be considered a destructive test and the test piece shall be disposed of in accordance with local environmental guidelines.

6.4 Leakage of hose assemblies

When tested in accordance with EN ISO 1402:2009, 8.4, there shall be no leakage or evidence of failure. This test shall be considered a destructive test and the test piece shall be disposed of in accordance with local environmental guidelines.