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English Version

**Rubber hoses and hose assemblies - Wire braid reinforced
hydraulic type - Specification**

Tuyaux et flexibles en caoutchouc - Type hydraulique avec
armature de fils métallique tressés - Spécification

Gummschläuche und -schlauchleitungen -
Hydraulikschläuche mit Drahtgeflechteinlage - Spezifikation

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 853:2015) 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of an identical text or by endorsement, at the latest by October 2015 and conflicting national standards shall be withdrawn at the latest by October 2015.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 853:1996.

In comparison with EN 853:1996, the following significant changes have been made:

- updated normative references;
- tolerances for inside diameter in Table 1;
- added Annex A;
- added Annex B;
- added Annex C.

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, ²⁰¹⁵ Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 853:2015 (E)

1 Scope

This European Standard specifies requirements for four types of wire braid reinforced hoses and hose assemblies of nominal bore from 5 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;
- water based fluids at temperatures ranging from -40 °C to +70 °C;
- water at temperatures ranging from 0 °C to +70 °C.

This 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

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)*

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 Types of hoses

Four types of hoses are specified:

- 1) Type 1ST - hoses with a single braid of wire reinforcement;
- 2) Type 2ST - hoses with two braids of wire reinforcement;
- 3) Type 1SN - hoses with a single braid of wire reinforcement;
- 4) Type 2SN - hoses with two braids of wire reinforcement.

Types 1SN and 2SN shall be of the same reinforcement construction as types 1ST and 2ST, except that they shall have thinner covers designed to assemble with fittings that do not require removal of the cover or a portion of the cover.

4 Materials and construction

4.1 Hoses

Hoses shall consist of an oil and water resistant synthetic rubber lining, one or two layers of high tensile steel wire and an oil and weather resistant 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	All types		Type 1ST				Type 1SN			Type 2ST				Type 2SN		
	Inside diameter		Diameter over reinforcement		Outside diameter of hose		Outside diameter of hose	Cover thickness		Diameter over reinforcement		Outside diameter of hose		Outside diameter of hose	Cover thickness	
	min.	max.	min.	max.	min.	max.	max.	min.	max.	min.	max.	min.	max.	max.	min.	max.
5	4,9	5,4	9,0	10,0	11,9	13,5	12,5	0,8	1,5	10,6	11,6	15,1	16,7	14,1	0,8	1,5
6	6,4	7,0	10,6	11,6	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	7,9	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	9,5	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	12,7	13,5	17,5	19,1	22,2	23,8	21,4	0,8	1,5	19,0	20,6	23,8	25,4	23,0	0,8	1,5
16	15,8	16,7	20,6	22,2	25,4	27,0	24,5	0,8	1,5	22,2	23,8	27,0	28,6	26,2	0,8	1,5
19	18,8	19,8	24,6	26,2	29,4	31,0	28,5	0,8	1,5	26,2	27,8	31,0	32,6	30,1	0,8	1,5
25	25,4	26,4	32,5	34,1	37,1	39,1	36,6	0,8	1,5	34,1	35,7	38,5	40,9	38,9	1,0	2,0
31	31,8	33,0	39,3	41,7	44,4	47,6	44,8	1,0	2,0	43,3	45,7	49,2	52,4	49,5	1,0	2,0
38	38,1	39,3	45,6	48,0	50,8	54,0	52,1	1,5	2,5	49,6	52,0	55,6	58,8	55,9	1,3	2,5
51	50,6	52,0	58,7	61,7	65,1	68,3	65,5	1,5	2,5	62,3	64,7	68,2	71,4	68,6	1,3	2,5

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

Table 2 — Concentricity of hoses

Dimensions in millimetres, except nominal bore

Nominal bore	Maximum variation in wall thickness		
	Between inside diameter and outside diameter	Between inside diameter and reinforcement diameter	
		Types 1ST and 1SN	Types 2ST and 2SN
Up to and including 6	0,8	0,4	0,4
Over 6 and including 19	1,0	0,6	0,7
Over 19	1,3	0,8	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
- over 10 m to 20 : not less than 80 % 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.