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EUROPEAN STANDARD

EN 855

NORME EUROPÉENNE

EUROPÄISCHE NORM

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Descriptors: plastic tubes, hoses, thermoplastic resins, weaves, hydraulic systems, hydraulic fluids, specifications, dimensions, dimensional tolerances, tests, service pressure, marking

English version

**Plastics hoses and hose assemblies -  
Thermoplastics textile reinforced hydraulic type -  
Specification**

Tuyaux et flexibles en plastique - Type  
hydraulique en thermoplastiques à armature de  
textile - Spécification

Kunststoffschläuche und -schlauchleitungen -  
Kunststoff-Hydraulikschläuche mit Textileinlage  
- Spezifikation

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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.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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**CEN**

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

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Contents	Page
<b>Foreword</b>	2
<b>1 Scope</b>	3
<b>2 Normative references</b>	3
<b>3 Types of hoses</b>	4
<b>4 Materials and construction</b>	4
4.1 Hoses	4
4.2 Hose assemblies	4
<b>5 Dimensions</b>	4
5.1 Diameters and concentricity	4
5.2 Length	5
<b>6 Requirements</b>	6
6.1 Hydrostatic requirements	6
6.2 Minimum bend radius	6
6.3 Impulse test requirement	7
6.4 Leakage of hose assemblies	7
6.5 Cold flexibility	7
6.6 Fluid resistance	8
6.7 Ozone resistance	8
6.8 Electrical conductivity	8
<b>7 Designation</b>	8
<b>8 Marking</b>	8
8.1 Hoses	8
8.2 Hose assemblies	10
<b>Annex A (Normative) Method of test for electrical conductivity</b>	10

**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 3949.

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 September 1996, and conflicting standards shall be withdrawn at the latest by September 1996.

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.

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## 1 Scope

This European Standard specifies requirements for two types of textile reinforced thermoplastics hoses and hose assemblies with maximum working pressures in the range of 69 bar to 345 bar. The hoses are suitable for use with

- petroleum and synthetic based hydraulic fluids at temperatures ranging from -40 °C to +100 °C;
- water based hydraulic 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: Operating temperatures in excess of 100 °C may materially reduce the life of the hose.

NOTE 2: Requirements for hydraulic hoses for underground mining are standardised in separate standards.

## 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 revision 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 hoses 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 ISO 1402	Rubber and plastics hoses and hose assemblies - Hydrostatic testing (ISO 1402:1994)
ISO 1817	Rubber, vulcanized - Determination of the effect of liquids
ISO 6803	Rubber or plastics hoses and hose assemblies - Hydraulic pressure impulse test without flexing

### 3 Types of hoses

Two types of hoses, Types R7 and R8, are specified distinguished by their maximum working pressure (see table 4):

### 4 Materials and construction

#### 4.1 Hose

The hose shall consist of a seamless thermoplastics lining resistant to hydraulic fluids, with a suitable synthetic fibre reinforcement and a thermoplastics cover resistant to hydraulic fluids and the weather.

#### 4.2 Hose assemblies

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

### 5 Dimensions

#### 5.1 Diameters and concentricity

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

Table 1: Diameters of hoses

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Dimensions in millimetres

Nominal bore	Internal diameter				Maximum outside diameter	
	Type R7		Type R8		Type R7	Type R8
	min.	max.	min.	max.		
5	4,6	5,4	4,6	5,4	11,4	14,6
6	6,2	7,0	6,2	7,0	13,7	16,8
8	7,7	8,5	-	-	15,6	-
10	9,3	10,3	9,3	10,3	18,4	20,3
12	12,3	13,5	12,3	13,5	22,5	24,6
16	15,6	16,7	15,6	16,7	25,8	29,8
19	18,6	19,8	18,6	19,8	28,6	33,0
25	25,0	26,4	25,0	26,4	34,7	38,6

When measured in accordance with EN 24671, the concentricity of hoses shall comply with the values given in table 2.

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**Table 2: Concentricity of hoses**  
Dimensions in millimetres

Nominal bore	Maximum variation in wall thickness
	Between internal diameter and outside diameter
Up to and including 6	0,8
Over 6 and including 19	1,0
Over 19	1,3

## 5.2 Length

### 5.2.1 Hoses

The 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 hoses 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 3.

**Table 3: Tolerances of length of hose assemblies**

Dimensions in millimetres

Hose assembly length	Tolerances
Up to and including 630	+ 7 - 3
Over 630 and including 1250	+ 12 - 4
Over 1250 and including 2500	+ 20 - 6

## 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 hose and hose assemblies shall comply with the values given in table 4.

**Table 4: Maximum working pressure, proof pressure and burst pressure**

Nominal bore	Maximum working pressure bar <sup>1)</sup>		Proof pressure bar		Burst pressure bar	
	Type		Type		Type	
	R7	R8	R7	R8	R7	R8
5	205	345	410	690	820	1380
6	190	345	380	690	760	1380
8	170	-	340	-	680	-
10	155	275	310	550	620	1100
12	135	240	270	480	540	960
16	100	190	200	380	400	760
19	86	155	172	310	344	620
25	69	138	138	275	276	550

<sup>1)</sup> 1 bar = 0,1 MPa

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  $\pm 3\%$

### 6.2 Minimum bend radius

When bent to the minimum bend radius 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.



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Table 5: Minimum bend radius

Dimensions in millimetres

Nominal bore	Minimum bend radius
5	90
6	100
8	115
10	125
12	180
16	205
19	240
25	300

### 6.3 Impulse test requirements

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

6.3.2 For type R7 hose, when tested at impulse pressure equal to 125 % of the maximum working pressure, the hose shall withstand a minimum of 150 000 impulse cycles.

For type R8 hose, when tested at impulse pressure equal to 133 % of the maximum working pressure, 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 thrown away.

### 6.4 Leakage of hose assemblies

When tested in accordance with EN ISO 1402 there shall be no leakage or evidence of failure. This test shall be considered a destructive test and the test piece shall be thrown away.

### 6.5 Cold flexibility

When tested in accordance with method B of EN 24672 at a temperature of -40 °C there shall be no cracking of the lining or cover. The test piece shall not leak or crack when subjected to a proof pressure test after regaining ambient temperature.