SLOVENSKI STANDARD
SIST EN 1947:2003+A1:2007

01-julij-2007

Gasilske cevi - Poltoge tlaļ ne cevi, vgrajene k ļ rpalkam in v vozila

Fire-fighting hoses - Semi-rigid delivery hoses and hose assemblies for pumps and vehicles

Feuerlöschschläuche - Formstabile Druckschläuche und Einbände für Pumpen und Feuerwehrfahrzeuge

Tuyaux de lutte contre l'incendie - Tuyaux de refoulement semi-rigides et flexibles pour pompes et véhicules

Ta slovenski standard je istoveten z: EN 1947:2002+A1:2007

ICS:

13.220.10	Gašenje požara	Fire-fighting
23.040.70	Gumene cevi in armature	Hoses and hose assemblies

SIST EN 1947:2003+A1:2007 en;fr;de

EUROPEAN STANDARD

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EN 1947:2002+A1

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ICS 13.220.10; 23.040.70

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English Version

Fire-fighting hoses - Semi-rigid delivery hoses and hose assemblies for pumps and vehicles

Tuyaux de lutte contre l'incendie - Tuyaux de refoulement semi-rigides et flexibles pour pompes et véhicules

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Contents

Foreword

This document (EN 1947:2002+A1:2007) has been prepared by Technical Committee CEN/TC 192, "Fire service equipment", 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of an identical text or by endorsement, at the latest by October 2007 and conflicting national standards shall be withdrawn at the latest by October 2007.

This document includes Amendment 1, approved by CEN on 2007-03-12.

This document supersedes EN 1947:2002.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ⟦A1⟩ ⟨A1⟧

At present there is no existing ISO Standard on the same subject but ISO 4642:1978 “Rubber products - Hoses, non-collapsible, for fire-fighting service” is under revision by ISO/TC 45. Requirements for semi-rigid hoses for use with fixed systems are given in EN 694; those for non-percolating layflat hoses are given in prEN 1924 (pumps and vehicles) and prEN 14540 (fixed systems).

⟦A1⟩ *deleted text* ⟨A1⟧

Users of this European Standard are advised to consider the desirability of independent certification of product conformity with this European Standard based on testing and continuing surveillance, which may be coupled with assessment of a supplier’s quality system against EN ISO 9001.

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

The European Standard is mainly concerned with fire service semi-rigid delivery hoses and incorporates those hoses used manually to control and extinguish fires.

1 Scope

This European Standard specifies the requirements and test methods for semi-rigid reel hoses for use on fire-fighting vehicles and trailer pumps. The hoses are intended for use at a maximum working pressure of 1,5 MPa for normal pressure hoses (category I) and 4,0 MPa for high pressure hoses (category II). The hoses are further subdivided into types and classes (see clause 4).

The standard applies to delivery hoses for fire-fighting purposes intended for use at a minimum ambient temperature of -20 °C.

NOTE 1 Hoses for use at temperatures lower than -20 °C may be supplied by agreement between the manufacturer and purchaser.

Hoses conforming to this standard should be used with fire hose couplings conforming to the relevant national standards couplings.

Requirements are also given for hose assemblies (see clause 9) where these are fitted by the hose manufacturer.

NOTE 2 All pressures are expressed in megapascals. 1 MPa = 10 bar.

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 (including amendments).

EN 27326:1993, *Rubber and plastics hoses — Assessment of ozone resistance under static conditions (ISO 7326:1991).*

EN 28033, *Rubber and plastics hose — Determination of adhesion between components (ISO 8033:1991).*

EN ISO 176:1999, *Plastics — Determination of loss of plasticizers — Activated carbon method (ISO 176:1976).*

EN ISO 1307, *Rubber and plastics hoses for general-purpose industrial applications — Bore diameters and tolerances, and tolerances on length (ISO 1307:1992).*

EN ISO 1402, *Rubber and plastics hoses and hose assemblies — Hydrostatic testing (ISO 1402:1994).*

EN ISO 4672:1999, *Rubber and plastics hoses — Sub-ambient temperature flexibility tests (ISO 4672:1997).*

ISO 188, *Rubber, vulcanized or thermoplastic— Accelerated ageing and heat-resistance tests.*

ISO 4671:1984, *Rubber and plastics hoses and hose assemblies — Methods of measurement of dimensions.*

ISO 8330, *Rubber and plastics hoses and hose assemblies — Vocabulary.*

3 Terms and definitions

For the purposes of this European Standard the following term and definition apply, together with those for working pressure, proof pressure and burst pressure given in ISO 8330.

3.1
semi-rigid hose
hose which maintains its round cross-section even when unpressurized

4 Classification

4.1 General

All types and classes of hose shall be so flexible that they can be rolled and kept on a drum of minimum diameter 200 mm for 12 mm inside diameter, 19 mm inside diameter and 25 mm inside diameter hose and of minimum diameter 280 mm for 33 mm inside diameter hose.

Hoses shall be one of two categories distinguished by the maximum working pressure. Each hose shall be further divided into one of three types distinguished by its construction, and then into six classes distinguished by the materials used for lining and cover.

NOTE The hose may be coloured by agreement between the purchaser and the manufacturer.

4.2 Classification by types (hose construction)

Type A hoses shall consist of:

a) a seamless rubber or plastics lining;

b) a textile spiral or braided reinforcement;

c) a rubber or plastics cover.

Type B hoses shall consist of:

a) a seamless rubber or plastics lining;

b) a circular woven textile reinforcement with a rigid spiral helix;

c) an uncovered or rubber or plastics cover.

Type C hoses shall consist of:

a) a seamless rubber or plastics lining;

b) any suitable reinforcement;

c) a rubber or plastics cover.

NOTE Whilst the construction of types A and C hoses may be similar or even identical, the performance requirements differ for the following: burst and proof pressure, adhesion, hot surface resistance, crush resistance.

4.3 Classification by class (materials for lining and cover)

The hose types shall be further subdivided into six classes dependent on the materials used in the construction in accordance with Table 1.

Table 1 — Classes and materials

Class	Lining material	Cover material
1	rubber	rubber
2	plastics	plastics
3	rubber	plastics
4	plastics	rubber
5	rubber	no cover
6	plastics	no cover

4.4 Classification by category

All hoses shall be divided into two categories dependent on the maximum working pressure in accordance with Table 2.

Table 2 — Maximum working pressure, proof pressure and minimum burst pressure

Pressure Mpa	Category I Types A and B Classes 1 to 6	Category II Types A and B Classes 1 to 6	 Type C Classes 1 to 6
Maximum working pressure	1,5	4,0	4,0
Proof pressure	3,0	6,0	8,0
Minimum burst pressure	4,5	10,0	12,0

EXAMPLE: A type C hose, constructed using a rubber lining and rubber cover and which has a maximum working pressure of 4,0 MPa, a proof pressure of 8,0 MPa and a minimum burst pressure of 12,0 MPa is classified as II/C/1.

5 Dimensions, tolerances and maximum mass

5.1 Inside diameter and maximum mass

The inside diameter of the hose and tolerances, when measured in accordance with ISO 4671 using any suitable method stated in clause 4 of that standard, shall conform to the requirements given in Table 3. The mass per metre length of the hose shall be in accordance with Table 3.

Table 3 — Inside diameter, tolerances on inside diameter and maximum mass per unit length

Inside diameter mm	Tolerances for inside diameter mm		Mass per unit length kg/m	
	Types A and C	Type B	Types A and C max.	Type B max.
12	0 to + 0,6	—	0,30	—
19	0 to + 0,9	0 to + 1,5	0,75	0,25
25	0 to + 1,2	0 to + 1,5	0,90	0,35
33	0 to + 1,6	0 to + 2,0	1,00	0,50

5.2 Length and tolerances on length

The total length of hose supplied shall be in accordance with the purchaser's requirements and shall be stated in metres. Tolerance on length shall be in accordance with EN ISO 1307.

5.3 Concentricity

When tested in accordance with 8.2 Method 2 of ISO 4671:1984, the variation from concentricity measured between inside and outside diameters shall not exceed the following values:

Types A and C 1,5 mm

Type B 0,4 mm

6 Performance requirements of finished hose

6.1 Hydrostatic requirements

6.1.1 Deformation under maximum working pressure

The dimensional stability of the hose, when tested in accordance with EN ISO 1402, shall conform to the requirements given in Table 4. The length of the test piece shall be 1 m.

For category I hoses the initial test pressure shall be 0,07 MPa and the final test pressure shall be 1,5 MPa. For category II hoses the initial test pressure shall be 0,07 MPa and the final test pressure shall be 4,0 MPa.

The twist shall be not greater than 30°/m for types A and C. For type B the twist may be greater than 30°/m but in this case it shall only be in a direction which closes the coupling and shall be stated in the test report.

Table 4 — Change in length and external diameter

	Tolerances for types A, B and C %
Change in length	0 to +7,5
Change in external diameter	0 to +7,5

NOTE Hose with a lower maximum change in length may be agreed between the purchaser and manufacturer.

6.1.2 Deformation under proof pressure

A proof pressure hold test shall be carried out on three hose lengths each of 1 m in accordance with EN ISO 1402. The proof pressure shall be as given in table 2 and on examination during the test, the test pieces shall not show any evidence of leakage, cracking, abrupt distortion or other signs of failure.

6.1.3 Minimum burst pressure

[A1] A burst pressure test shall be carried out in accordance with EN ISO 1402 on the three test pieces used for the deformation under proof pressure test.

NOTE It is not necessary to increase the pressure above the minimum burst value to burst the hose. It is sufficient to increase the pressure to the required minimum burst pressure stated in Table 2 in order to pass this test requirement. This should be stated in the Test Report. [A1]

Each of the test pieces shall not burst at a pressure less than that given in Table 2.

6.1.4 Kink pressure

When tested in accordance with annex A, the test piece shall neither burst nor show any visible signs of defect before or after pressurizing at 1,5 MPa for category I hoses and at 4,0 MPa for category II hoses.

6.2 Adhesion

When tested in accordance with EN 28033 the adhesion between all components shall be not less than 1,5 kN/m for type A hoses, 1,0 kN/m for type B hoses and 2,0 kN/m for type C. Dependent on the construction of the hose, the test piece in all cases shall be decided by the test laboratory in accordance with EN 28033.

6.3 Accelerated ageing

When tested in accordance with annex B, the three test pieces subjected to the burst pressure test shall conform to the requirements of 6.1.3. The mean of the burst pressure test results shall not decrease by more than 25 % from the initial mean burst value determined from the results obtained in 6.1.3.

The resultant adhesion of the fourth test piece shall be in accordance with the requirements of 6.2.

NOTE There is no limitation on the increase in the values of these properties.