SLOVENSKI STANDARD
SIST EN 14540:2004

01-julij-2004

Gasilske cevi ï Gasilske poltoge tlaļ ne cevi za vgrajene sisteme

Fire-fighting hoses - Non-percolating layflat hoses for fixed systems

Feuerlöschläuche - Druckschlauche für Wandhydranten

Tuyaux de lutte contre l'incendie - Tuyaux aplatissables étanches pour systemes fixes

Ta slovenski standard je istoveten z: **EN 14540:2004**

ICS:

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

SIST EN 14540:2004 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 14540

May 2004

ICS 13.220.10; 23.040.70

English version

Fire-fighting hoses - Non-percolating layflat hoses for fixed systems

Tuyaux de lutte contre l'incendie - Tuyaux aplatissables étanches pour systèmes fixes

Feuerlöschschläuche - Flachschläuche für Wandhydranten

This European Standard was approved by CEN on 1 August 2003.

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.

This European Standard exists 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.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 14540:2004: E

Contents

Foreword

This document (EN 14540:2004) 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of an identical text or by endorsement, at the latest by November 2004, and conflicting national standards shall be withdrawn at the latest by November 2004.

The standard is based on recommendations from CEN/TC 191 “Fixed fire fighting systems” and should be read in conjunction with EN 671-2.

prEN 1924 and prEN 14550 have the general title “Fire-fighting hoses”, prEN 1924 gives requirements for Non-percolating layflat delivery hoses and hose assemblies for pumps and vehicles and this Standard gives requirements for “Non-percolating layflat hoses for fixed systems”. Requirements for semi-rigid hoses are given in EN 1947 (pumps and vehicles) and in EN 694 (fixed systems).

NOTE prEN 1924-2 was renumbered following enquiry to EN 14540 and prEN 1924-1 is now prEN 1924

At present there is no existing ISO standard on the same subject.

Annexes A to E are normative.

Recommendations on the frequency at which tests specified in this standard should be carried out are given in annex F.

This document includes a Bibliography.

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

Introduction

A fixed system is a manually operated unit installed in a building in order to make it possible for the occupants to control and extinguish a small fire. The system consists of fixed units mounted on walls or in cabinets permanently connected to a water supply. The fixed units are composed of a coupling, a valve with a pressure indicator, a layflat water filled hose with its support and a nozzle.

1 Scope

This European Standard specifies the requirements and test methods for non-percolating layflat hoses for fixed systems. The hoses are intended for use at a maximum working pressure of 1,5 MPa over a range of inside diameters from 25 mm to 52 mm.

The standard applies exclusively to hoses for fire-fighting purposes intended for use at a minimum ambient temperature of -20 °C in normal conditions, and a minimum temperature of -30 °C in colder climatic conditions.

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

Hoses in marine applications and/or aggressive environments to be used with wall hydrants as specified in EN 671-2 can conform to the requirements of this Standard or prEN 1924, but prEN 1924 is preferred in these applications.

NOTE All pressures are gauge pressures and are expressed in megapascals[1].

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

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 4671, *Rubber and plastics hoses and hose assemblies — Methods of measurement of dimensions (ISO 4671:1999).*

EN ISO 8330:2000, *Rubber and plastics hoses and hose assemblies - Vocabulary (ISO 8330:1998).*

ISO 188, *Rubber, vulcanised or thermoplastic — Accelerated ageing or heat resistance tests.*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 8330:2000 and the following apply.

[1] 1 MPa = 10 bar

3.1
layflat hose
hose with a soft wall which, when unpressurized internally, collapses to such an extent that the inner faces of the inside diameter make contact and the hose takes up a flat cross-sectional appearance

3.2
jacket
circular woven seamless reinforcement

4 Materials and construction of hose

The hose shall be uncovered. It shall consist of the following:

an impermeable rubber or plastics lining;

a synthetic fibre jacket.

NOTE 1 The hose jacket can be dyed or pigmented.

NOTE 2 The hose manufacturer should weave the jacket and assemble the jacket and lining.

NOTE 3 The lining should be as smooth as possible so as to minimize friction.

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 EN ISO 4671 shall conform to the requirements given in Table 1. The mass per metre length for a length of hose of at least 2 m, without couplings fitted, shall not exceed the value given in Table 1.

Table 1 — 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 max.
25	-0,5 to +1,0	0,18
38	-0,5 to +1,5	0,24
40/42/45		0,29
50/51/52		0,35

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. Tolerances on length shall be in accordance with EN ISO 1307.

NOTE The coil or flake size, and the test procedures to determine these can, if considered necessary, be agreed between the manufacturer and purchaser.

6 Performance requirements of finished hose

6.1 Hydrostatic requirements

6.1.1 Deformation under normal working pressure

The dimensional stability of the hose when tested in accordance with EN ISO 1402, shall conform to the requirements of Tables 2 and 3.

The initial test pressure shall be 0,07 MPa, and the final test pressure shall be 1,0 MPa.

The twisting line shall be clockwise.

Table 2 — Change in length and external diameter

	Tolerances %
Change in length	0,0 to +5,0
Change in external diameter	0,0 to +5,0

Table 3 — Twisting line

Inside diameter mm	**Maximum twist** °/m
25	120
38 to 52 inclusive	100

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 4 and on examination during the test, the test pieces shall not show any evidence of leakage, cracking, abrupt distortion or other signs of failure.

Table 4 — Working pressures, proof pressure and minimum burst pressure

	Pressure MPa
Normal working pressure	1,0
Maximum working pressure[a]	1,5
Proof pressure[b]	2,25
Minimum burst pressure	4,5

[a] To accommodate pump close down pressures, the maximum working pressure may be exceeded by a maximum of 0,2 MPa for short periods only.

[b] A statistically based sampling plan may be used to provide evidence that hoses in a given batch conform to the proof pressure requirement.

6.1.3 Minimum burst pressure

Three test pieces of length 1 m shall be subjected to the burst pressure test as specified in EN ISO 1402.

No individual test piece shall burst at less than the burst pressure given in Table 4.

6.1.4 Kink pressure

When tested in accordance with annex A, the test piece shall neither burst nor show any signs of defect when examined visually before or after being subjected to the proof pressure given in Table 4.

6.2 Adhesion

When tested in accordance with type 1 of EN 28033 the adhesion between the lining and jacket shall be not less than 1,0 kN/m.

The test piece shall be of length (25 ± 0,5) mm cut at right angles to the longitudinal axis of the hose. The ring shall be cut transversely and opened out to form a strip and the adhesion determined with the rate of travel of the power driven grips such that a rate of ply separation of (50 ± 5) mm/min is obtained.

If an adhesion result is not possible because of tearing due to high adhesion, this shall be accepted as a pass. All adhesions shall be attempted and the results recorded.

6.3 Accelerated ageing

When tested in accordance with annex B, the three flaked 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 pressure value determined from the results obtained in 6.1.3.

The adhesion between lining and jacket of the coiled test piece shall be not less than 0,9 kN/m.

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

6.4 Low temperature flexibility

When tested in accordance with annex C, the inner lining of the hose shall not crack or become loose from the jacket after 15 cycles. The test temperatures shall be as specified below:

Standard test temperature	(-20 ± 2) °C
Special test temperature	(-30 ± 2) °C

NOTE The special test temperature requirement is for hoses for use in the colder climatic conditions of Northern Europe.

6.5 Hot surface resistance

When tested in accordance with annex D at a test temperature of (200 ± 10) °C, in none of the four tests shall the test piece show signs of leakage within 120 s from the application of the filament rod or on removal of the filament rod after this period.

6.6 Resistance to kinking

When tested in accordance with annex E and using a bending radius 10 times its inside diameter, the hose shall not show any kinks when examined visually.

7 Marking

Each length of hose shall be legibly and permanently marked with the following minimum information, at least twice per length, at both ends:

a) the manufacturer's name or trade mark (see note 2 to clause 4);

b) the number and date of this European Standard;

c) the inside diameter;

d) the maximum working pressure in MPa(bar);

e) the quarter and year of manufacture;

f) the test temperature if lower than -20 °C (see 6.4);

g) the approval number and the certifying body or its reference, where applicable.

EXAMPLE Man - EN 14540: 2003 - 45 - 1,5(15) - 2Q/2003