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

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Denna standard ersätter SS-EN 14540:2004+A1:2007, utgåva 1.

The European Standard EN 14540:2014 has the status of a Swedish Standard. This document contains the official version of EN 14540:2014.

This standard supersedes the Swedish Standard SS-EN 14540:2004+A1:2007, edition 1.

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EUROPEAN STANDARD

EN 14540

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2014

ICS 13.220.10; 23.040.70

Supersedes EN 14540:2004+A1:2007

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 - Flachschräuche für Wandhydranten

This European Standard was approved by CEN on 28 May 2014.

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 CEN-CENELEC Management Centre or to any CEN member.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 14540:2014) has been prepared by Technical Committee CEN/TC 192 "Fire and Rescue 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of an identical text or by endorsement, at the latest by January 2015 and conflicting national standards shall be withdrawn at the latest by January 2015.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 14540:2004+A1:2007.

This revised standard now references EN 15889:2011, *Fire-fighting hoses - Test methods*, which includes the test methods formerly in annexes within EN 14540.

This standard is based on liaison with CEN/TC 191 "Fixed fire-fighting systems" and should be read in conjunction with EN 671-2.

Requirements for semi-rigid hoses for use with fire-fighting pumps and vehicles are given in EN 1947; those semi-rigid hoses for fixed systems are given in EN 694.

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.

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 hose with its support and a nozzle.

The fixed systems are specified in EN 671-2, *Fixed firefighting systems — Hose systems — Part 2: Hose systems with lay-flat hose*.

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.

This European Standard applies exclusively to hoses for fire-fighting purposes intended for use at a minimum ambient temperature of $-20\text{ }^{\circ}\text{C}$ in normal conditions, and a minimum temperature of $-30\text{ }^{\circ}\text{C}$ in colder climatic conditions and a maximum ambient temperature of $+60\text{ }^{\circ}\text{C}$. Hoses conforming to this standard should be used with fire hose couplings conforming to the relevant national standards for couplings.

NOTE 1 Hoses for use at ambient temperatures below $-20\text{ }^{\circ}\text{C}$ can be supplied if they have been tested at the specified lower temperature in accordance with 6.4 and identified by their marking in Clause 8 f).

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.

NOTE 2 All pressures are gauge pressures and are expressed in megapascals¹.

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 15889:2011, *Fire-fighting hoses - Test methods*

EN ISO 1307, *Rubber and plastics hoses - Hose sizes, minimum and maximum inside diameters, and tolerances on cut-to-length hoses (ISO 1307)*

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

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

EN ISO 8330, *Rubber and plastics hoses and hose assemblies - Vocabulary (ISO 8330)*

¹ 1 MPa = 10 bar

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 8330 and the following apply.

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:

- a) a water impermeable rubber or plastics lining;
- b) a synthetic fibre jacket.
 - 1) The hose jacket can be dyed or pigmented.
 - 2) The hose manufacturer should weave the jacket and assemble the jacket and lining.

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	Tolerances for inside diameter	Maximum mass per unit length
mm	mm	kg/m
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 stated in metres.

Tolerance 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 stated by the 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 Table 2 and Table 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.