



**SLOVENSKI STANDARD**  
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**Vgrajene naprave za gašenje - Gašenje s peno - 1. del: Zahteve in preskusne metode za sestavne dele**

Fixed firefighting systems - Foam systems - Part 1: Requirements and test methods for components

Ortsfeste Brandbekämpfungsanlagen - Schaumlöschanlagen - Teil 1: Anforderungen und Prüfverfahren für Bauteile

Installations fixes de lutte contre l'incendie - Systemes a émulseurs - Partie 1: Exigences et méthodes d'essais des éléments constitutifs

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## Fixed firefighting systems - Foam systems - Part 1: Requirements and test methods for components

Installations fixes de lutte contre l'incendie - Systèmes à émulseurs - Partie 1: Exigences et méthodes d'essais des éléments constitutifs

Ortsfeste Brandbekämpfungsanlagen - Schaumlöschanlagen - Teil 1: Anforderungen und Prüfverfahren für Bauteile

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**EN 13565-1:2003+A1:2007 (E)****Foreword**

This document (EN 13565-1:2003+A1:2007) has been prepared by Technical Committee CEN/TC 191, "Fixed firefighting systems" the secretariat of which is held by BSI.

This document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2007 and conflicting national standards shall be withdrawn at the latest by April 2007.

This document includes Amendment 1, approved by CEN on 2007-09-13.

This document supersedes EN 13565-1:2003.

The start and finish of text introduced or altered by amendment is indicated in the text by tags  $\boxed{A_1}$   $\boxed{A_1}$ .

$\boxed{A_1}$  *deleted text*  $\boxed{A_1}$

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.

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## Introduction

This European Standard covers components intended for use in fixed fire fighting foam systems.

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**EN 13565-1:2003+A1:2007 (E)****1 Scope**

This European Standard specifies requirements for materials, construction, and performance of components intended for use in fixed foam fire fighting systems, and using foam concentrates conforming to EN 1568-1 to EN 1568-4. The components covered are: proportioners, sprayers, semi-subsurface hose units, branchpipes, low/medium expansion foam generators, high expansion foam generators, foam chambers, tanks and pressure vessels. Methods of test are given in annexes A to K.

Requirements are also given for the provision of the characteristic data needed for correct application of components.

NOTE 1 Unless otherwise stated pressures are gauge pressures expressed in bar.

The requirements of this specification do not cover, except where stated, the use of combinations of components to form part, or the whole, of a fire fighting system.

NOTE 2 It should not be assumed that components conforming to this specification are necessarily compatible one with another.

Requirements for pumps, motors and the functioning of mechanical components (i.e. remote control turrets) are outside the scope of this standard.

**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 671-1:2001, *Fixed firefighting systems - Hose systems - Part 1: Hose reels with semi-rigid hose*

EN 1568-1: 2000, *Fire extinguishing media - Foam concentrates - Part 1: Specification for medium expansion foam concentrates for surface application to water-immiscible liquids*

EN 1568-2:2000, *Fire extinguishing media - Foam concentrates - Part 2: Specification for high expansion foam concentrates for surface application to water-immiscible liquids*

EN 1568-3:2000, *Fire extinguishing media - Foam concentrates - Part 3 Specification for low expansion foam concentrates for surface application to water-immiscible liquids*

EN 1568-4, *Fire extinguishing media - Foam concentrates - Part 4: Specification for low expansion foam concentrates for surface application to water-miscible liquids*

EN 12259-1:1999+A1:2001 <sup>A1</sup>, *Fixed fire fighting systems – Components for sprinkler and water spray systems - Part 1: Sprinklers*

EN 12416-1:2001, *Fixed firefighting systems - Powder systems - Part 1: Requirements and test methods for components*

EN 12542, *Static welded steel cylindrical tanks, serially produced for the storage of Liquefied Petroleum Gas (LPG) having a volume not greater than 13 m<sup>3</sup> and for installation above ground - Design and manufacture*

EN 20225, *Fasteners - Bolts, screws, studs and nuts – Symbols, designations and dimensions (ISO 225:1983)*

EN ISO 175, *Plastics - Methods of test for the determination of the effects of immersion in liquid chemicals (ISO 175:1999)*



EN ISO 179-1, *Plastics - Determination of Charpy impact properties - Part 1: Non-instrumented impact test (ISO 179-1:2000)*

EN ISO 180, *Plastics - Determination of Izod impact strength (ISO 180:2000)*

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*

EN ISO 527-1, *Plastics - Determination of tensile properties - Part 1: General principles (ISO 527-1:1993 including Corr 1:1994)*

EN ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel - Part 1: Bolts, screws and studs (ISO 898-1:1999)*

EN ISO 4759-1, *Tolerances for fasteners - Part 1: Bolts, screws, studs and nuts - Product grades A, B and C (ISO 4759-1:2000)*

EN ISO 9001:2000 *Quality management systems – Requirements (ISO 9001:2000)*

ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads - Part 1: Dimensions, tolerances and designation*

ISO 272, *Fasteners - Hexagon products - Widths across flats*

ISO 885, *General purpose bolts and screws - Metric series - Radii under the head*

ISO 888, *Bolts screws and studs - Nominal lengths and thread length for general purpose bolts*

ISO 1179-1, *Connections for general use and fluid power - Ports and stud ends with EN ISO 228-1 threads with elastomeric or metal-to-metal sealing - Part 1: Threaded ports (Revision of ISO 1179:1981)*

ISO 4633, *Rubber seals - Joint rings for water supply, drainage and sewerage pipelines - Specification for material*

ISO 6447, *Rubber seals - Joint rings used for gas supply pipes and fittings - Specification for material*

ISO 6448, *Rubber seals - Joint rings used for petroleum product supply pipes and fittings - Specification for material*

ISO 7005-1, *Metallic flanges; Part 1: Steel flanges*

ISO 7005-2, *Metallic flanges; Part 2: Cast iron flanges*

ISO 9227, *Corrosion tests in artificial atmospheres; salt spray tests*

Nordtest method NT Fire 042

### 3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

#### 3.1

##### **aspirating component**

component within which air and foam solution are mixed to make foam

#### 3.2

##### **branchpipe**

component which projects foam in the form of a jet or spray

**EN 13565-1:2003+A1:2007 (E)****3.3****component**

item or piece of equipment intended for use in a fixed foam fire extinguishing system

**3.4****discharge coefficient (K factor)**

'K' factor for the equation  $Q = K\sqrt{dP}$  where Q is the flow rate through the component in l/min and dp is the inlet pressure in bar

**3.5****high back pressure foam generator**

component which introduces air into the foam solution stream for delivery against a high back pressure, for example, as is found in tank sub-surface injection

**3.6****high expansion foam**

foam which has an expansion ratio greater than 200

**3.7****foam generator**

component which introduces air into the foam solution stream for delivery against a low back pressure, i.e. discharging against atmospheric pressure

**3.8****low expansion foam**

foam which has an expansion ratio not greater than 20

**3.9****foam chamber**

component that incorporates a vapour seal, a foam expansion chamber, and which delivers foam into a flammable or combustible liquid storage tank. A foam generator may be connected to the foam chamber inlet

**3.10****medium expansion foam**

foam which has an expansion ratio greater than 20 but not greater than 200

**3.11****monitor**

component consisting of a branchpipe and turret

**3.12****non-aspirating components**

components which discharge a spray of foam solution so that mixing with air and formation of foam takes place outside the component

**3.13****fixed foam pourer (foam discharge outlet)**

component which discharges foam onto the internal wall of a tank

NOTE Some pourers are designed to discharge the foam tangentially in order to create a circular motion, and thus promote foam distribution.

**3.14****proportioning component**

component which controls the mixing of foam concentrate into a water flow, at a predetermined ratio, to produce a foam solution

NOTE Proportioning components are variously described as inline, bypass and round the pump inductors, injectors, eductors, proportioners, venturis, constant and variable flow valves, orifice plates, water powered foam pumps and displacement proportioners.

**3.15****semi-subsurface hose unit**

component which delivers foam below the surface of a flammable liquid so that it rises to the liquid surface within a flexible hose and spreads over the liquid surface

**3.16****sprayer**

open nozzle which discharges a spray of foam or foam solution

NOTE The terms sprayer and nozzle are regarded as interchangeable.

**3.17****supplier**

company with or without production facilities for components but responsible for the quality control, conformity and supply of the components

**3.18****turret**

device on which a foam branchpipe is mounted to allow rotation and elevation

NOTE The requirements for the testing of turrets are outside the scope of this standard.

**3.19****vapour seal**

frangible component designed to prevent tank contents vapours entering the foam pipework system while allowing foam to flow into the tank during system operation

**3.20****working pressure**

pressure at which the component is used in the system

**3.21****single orifice component**

component in which liquid flows through a single flow controlling orifice

**3.22****multiple orifice component**

component in which liquid flows simultaneously through more than one flow controlling orifice

**3.23****discharge characteristic**

pressure vs. flow relationship for components that incorporate pressure regulators and/or by-pass arrangements

**4 General construction requirements****4.1 Connections****4.1.1 Permanent connections and joints**

Permanent joints on components for connection to pipework or other components shall conform to ISO 7-1, EN ISO 228-1, ISO 1179-1, ISO 7005-1 or ISO 7005-2. Other technical specifications valid in the place of use of the component may be acceptable.

**4.1.2 Hose couplings**

Hose couplings shall conform to the requirements for delivery hose couplings and connectors as specified by the purchaser.

**EN 13565-1:2003+A1:2007 (E)****4.1.3 Bolting of pressure retaining parts**

Bolts, nuts and/or studs used to fasten pressure retaining parts shall conform to ISO 272, ISO 885, EN ISO 898-1 or EN ISO 4759-1.

The calculated load on any bolt or stud excluding the force required to compress the gasket shall not exceed the minimum tensile strength specified in EN 20225, ISO 888 or EN ISO 898-1 when the component is pressurised to four times the rated working pressure.

The area of the application of pressure shall be calculated using the following assumptions:

- a) If a full-face gasket is used, the assumed area of pressure application extends out to the centre line of the bolts.
- b) If an 'O' ring seal or ring gasket is used, the assumed area of pressure application extends out to the centre of the 'O' ring or gasket.

**4.2 Parts intended for removal during routine field maintenance****4.2.1 Removal**

Parts intended for removal during routine field maintenance shall be accessible, removable, and replaceable without damage using appropriate tools normally used by the trade, or special tools recommended by the component supplier.

**4.2.2 Re-assembly**

The design and construction of any part intended for removal during routine field maintenance shall be such that it cannot be re-assembled so as to cause malfunction of the component, without an external visible indication.

**4.3 Hydrostatic strength****4.3.1 Leak test**

The pressure retaining parts of components (including the connection joints), except atmospheric storage tanks and pressure vessels, shall withstand for 10 min without leakage an internal hydrostatic pressure of 1,5 times the working pressure specified by the supplier  $\begin{matrix} +1 \\ 0 \end{matrix}$  bar, when tested in accordance with annex A.

**4.3.2 Mechanical strength**

The component housing shall withstand a pressure of three times the design working pressure  $\begin{matrix} +1 \\ 0 \end{matrix}$  bar without rupture when tested in accordance with annex A.

**4.4 Castings**

Castings shall not be plugged or filled.

NOTE Castings should be free from adhering sand and scale. Castings should be impregnated only if agreed between the casting manufacturer and purchaser.

**4.5 Corrosion resistance of metal parts****4.5.1 General corrosion resistance of metal parts**

All mechanical components shall function satisfactorily (see Table 1) after being tested in accordance with ISO 9227 and EN 12416-1:2001 annex I.