SLOVENSKI STANDARD
SIST EN 3-8:2007

01-marec-2007

Prenosni gasilniki - 8. del: Dodatne zahteve k EN 3-7 za konstrukcijo, odpornost proti tlaku in mehanski preskusi za gasilnike z najveļjim dovoljenim tlakom, enakim ali niģjim od 30 bar

Portable fire extinguishers - Part 8: Additional requirements to EN 3-7 for the construction, resistance to pressure and mechanical tests for extinguishers with a maximum allowable pressure equal to or lower than 30 bar

Tragbare Feuerlöscher - Teil 8: Zusätzliche Anforderungen zu EN 3-7 an die konstruktive Ausführung, Druckfestigkeit, mechanische Prüfungen für tragbare Feuerlöscher mit einem maximal zulässigen Druck kleiner gleich 30 bar

Extincteurs d'incendie portatifs - Partie 8: Exigences additionnelles a l'EN 3-7 pour la construction, la résistance a la pression et les essais mécaniques pour extincteurs dont la pression maximale admissible est inférieure ou égale a 30 bar

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13.220.10 Gašenje požara Fire-fighting

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This European Standard was approved by CEN on 2 November 2006.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Contents

Foreword

This document (EN 3-8:2006) has been prepared by Technical Committee CEN/TC 70 "Manual means of fire fighting equipment", the secretariat of which is held by AFNOR.

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 June 2007, and conflicting national standards shall be withdrawn at the latest by June 2007.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 97/23/EC.

For relationship with EU Directive 97/23/EC, see informative Annex ZA, which is an integral part of this document.

This document is included in a series of European Standards planned to cover:

a) classification of fires (EN 2)

b) mobile fire extinguishers (EN 1866)

EN 3 consists of the following parts, under the general title "*Portable fire extinguishers*"

- *Part 1*[1)]*: Description, duration of operation, class A and B fire test*
- *Part 2*[1)]*: Tightness, dielectric test, tamping test, special provisions*
- *Part 3: Construction, resistance to pressure, mechanical tests*

- *Part 4*[1)]*: Charges, minimum required fire*
- *Part 5*[1)]*: Specification and supplementary tests*
- *Part 6: Provisions for the attestation of conformity of portable fire extinguishers in accordance with EN 3 part 1 to part 5*
- *Part 7: Characteristics, performance requirements and test methods*
- *Part 8*[2)]*: Additional requirements to EN 3-7 for the construction, resistance to pressure and mechanical tests for extinguishers with a maximum allowable pressure equal to or lower than 30 bar*
- *Part 9*[2)]*: Additional requirements to EN 3-7 for pressure resistance of CO_2 extinguishers*
- *Part 10*[3)]*: Provisions for evaluating the conformity of a portable fire extinguisher to EN 3 part 7*

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

[1)] Withdrawn and replaced by EN 3-7.

[2)] EN 3-8 and 3-9 update and amend EN 3-3. On publication of these EN 3-3 will be withdrawn.

[3)] In preparation. EN 3-10 updates and amends EN 3-6. On publication of EN 3-10 EN 3-6 will be withdrawn.

1 Scope

This European Standard specifies the rules of design, type testing, fabrication and inspection control of portable fire extinguishers manufactured with metallic bodies as far as pressure risk is concerned.

This part applies to portable fire extinguishers of which the maximum allowable pressure PS is lower than or equal to 30 bar and containing non-explosive, non-flammable, non-toxic and non-oxidising fluids.

This European Standard also applies to the metallic gas cartridge of a volume less than 0,12 l (see Annex E) and gives guidance for sound engineering practice for metallic gas cartridges equal to or greater than 0,12 l and less than 0,5 l, see Annex F.

This European Standard does not apply to carbon dioxide fire extinguishers.

NOTE Annex A gives the classification of the different parts forming the portable fire extinguisher.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 3-7:2004, *Portable fire extinguishers — Part 7: Characteristics, performance requirements and test methods*

EN 287-1:2004, *Qualification test of welders — Fusion welding — Part 1: Steels*

EN 1320:1996, *Destructive tests on welds in metallic materials — Fracture test*

EN 1418:1997, *Welding personnel — Approval testing of welding operators for fusion welding and resistance weld setters for fully mechanized and automatic welding of metallic materials*

EN 10204:2004[4)], *Metallic products — Types of inspection documents*

EN 13133:2000, *Brazing — Brazer approval*

EN 13134:2000, *Brazing — Procedure approval*

EN ISO 4892-2:1999, *Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps (ISO 4892-2:2006)*

EN ISO 9606-2:2004, *Qualification test of welders — Fusion welding — Part 2: Aluminium and aluminium alloys (ISO 9606-2:2004)*

EN ISO 15614-1:2004, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys (ISO 15614-1:2004)*

EN ISO 15614-2:2005, *Specification and qualification of welding procedures for metallic materials — Welding procedure test - Part 2: Arc welding of aluminium and its alloys (ISO 15614-2:2005)*

EN ISO 15614-12:2004, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 12: Spot, seam and projection welding (ISO 15614-12:2004)*

[4)] This standard is also applicable to non-metallic products (see EN 10204:2004, 1.2).

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 3-7:2004 and the following apply.

NOTE A scheme illustrating the different pressures is given in Annex B.

3.1
maximum pressure at maximum operating temperature, $P\,(T_{max})$ (pressure experimentally measured)
pressure measured in the extinguisher after stabilisation during at least 24 h at maximum operating temperature (T_{max}) and for cartridge operated extinguishers, the maximum pressure is the maximum pressure recorded for 0,5 s during a period of three minutes, excluding the first second after release of the propellant gas

3.2
maximum allowable pressure, PS (maximum declared pressure)
maximum pressure for which the equipment is designed, as specified by the manufacturer and which is in any case greater than or equal to $P\,(T_{max})$

NOTE The value of PS for components should be equal to or greater than the value of PS for the extinguisher assembly.

3.3
bursting pressure P_r
maximum pressure measured during a bursting test

3.4
portable fire extinguisher assembly
assembly of parts to comprise the pressure retaining part of a fire extinguisher which can include a body, operating device, filling cap, closure and may include a propellant gas cartridge, hose and other components under pressure, if fitted.

3.5
maximum operating temperature T_{max}
maximum operating temperature declared by the manufacturer equal to or less than TS_{max}

3.6
minimum operating temperature
T_{min}
minimum operating temperature declared by the manufacturer equal to or higher than TS_{min}

3.7
propellant gas cartridge
refillable or non-refillable pressure receptacle made of metal containing a propellant gas with a capacity less than 0,5 l

NOTE In the ADR these are classified as cylinders (definition 1.2).

3.8
fittings
pressure accessories which include operating devices, filling caps and hose assemblies

4 Symbols and abbreviations

For the purposes of this document, the following symbols and abbreviations apply.

PS Maximum allowable pressure in bar

PT Test pressure in bar

P_r	Bursting pressure in bar
D	Nominal external diameter of the body, or the largest external value of the perpendicular section to the axis, in mm
DN	Diameter in mm for circular products submitted to pressure or the diameter in mm of the equivalent flow section for non circular parts
D_B	Diameter of the mandrel used during the crushing test in mm
$P\ (T_{max})$	Pressure at maximum operating temperature, in bar
T_{max}	Maximum operating temperature declared by the manufacturer, in ºC
T_{min}	Minimum operating temperature declared by the manufacturer, in ºC
S	Minimum wall thickness in mm
TS_{min}	Minimum allowable temperature in ºC
TS_{max}	Maximum allowable temperature in ºC

5 Materials

5.1 Materials for bodies

An inspection certificate based on specific inspection in accordance with EN 10204 is required.

5.2 Materials for the bodies of operating devices and filling caps

The body material (metallic or plastics) of any operating device and filling cap shall be compatible with other products and shall have an appropriate certificate such as EN 10204:2004 test report 2.2.

5.3 Materials for other components

The materials used for other parts of extinguishers shall be suitable for the intended use and be compatible with the materials used for the pressure parts.

In the case of plastic materials, components shall comply with the requirements of Annex D.

6 Experimental design method and prototype testing

6.1 General

The minimum allowable temperature range declared of the body TS_{min} to TS_{max} shall be – 30 ºC to + 60 ºC. A wider temperature range may be declared by the manufacturer. Where this is the case, the temperatures and pressures used in this European Standard shall be amended to reflect this new temperature range.

6.2 Experimental design

6.2.1 Bodies – Minimum wall thickness

6.2.1.1 General

In no case shall the value of the wall thickness be below that given by the equations below.

6.2.1.2 Metallic bodies except austenitic steel bodies

The body shall have a measured wall thickness greater than the minimum wall thickness calculated using the following equation:

$$S = \frac{D}{300} + K$$

where

K is a coefficient with a value of:

0,45 for $D \leq 80$ mm;

0,50 for $D > 80$ mm and ≤ 100 mm;

0,70 for $D > 100$ mm.

6.2.1.3 Austenitic steel bodies

For austenitic steel bodies, the wall thickness measured shall be greater than the minimum wall thickness calculated using the following equation:

$$S = \frac{D}{600} + 0{,}3$$

This is subject to an absolute minimum thickness of 0,64 mm, including all tolerances.

6.2.2 Bodies – Requirements for the base

The portable extinguisher shall be constructed so that it may be:

— free-standing on a horizontal surface;

— and/or fixed to a vertical surface.

The shape of the base of the body is optional.

Bodies for extinguishers that may be free-standing shall either be fitted with a means to raise the pressure retaining part of the body at least 5 mm above the horizontal surface or the thickness of metal in the pressure retaining part of the body in contact with the horizontal surface shall be at least 1,5 times the minimum wall thickness(es) (see 6.2.1).

All parts less than 5 mm from the horizontal surface which are under pressure, shall be at 1,5 times the minimum wall thickness(es) (see 6.2.1).

6.2.3 Bodies – Requirements for use with plastics components

The threads shall be of the form as specified in D.2.6.

6.3 Prototype testing

6.3.1 General

Tests shall be carried out at (20 ± 5) °C) in accordance with 6.3.2 and 6.3.3.

The number of specimens tested shall be at least:

— for 6.3.2: 5 specimens;

— for 6.3.3: 5 specimens.

The tests described in 6.3.2 and 6.3.3 shall be carried out on a minimum of 10 bodies and fittings.

All the bodies used for the tests shall bear all normal markings indicated in Clause 9 and shall be in their finished state (e.g. painted).

Fittings include operating devices, filling caps and hose assemblies. The fittings need not be tested as part of the complete extinguisher but the test equipment connection and blanking features shall replicate the adjacent components.

6.3.2 Burst test under pressure

6.3.2.1 Test conditions

The burst test under hydraulic pressure shall be carried out using an installation which permits a regular increase of pressure at not more than 2 bar/s until the body bursts and also permits the variation of pressure to be recorded as a function of time.

6.3.2.2 Requirements – Bodies

The bursting pressure P_r shall not be less than 2,7 times the maximum allowable pressure PS subject to a minimum of 55 bar.

The burst test shall not cause the body to fragment.

The main break shall show no signs of brittleness, for example the edges of the break shall not be radial, but shall be inclined relative to a diametral plane and shall have a reduction in area over their entire thickness.

The break shall not show any obvious defects in the material.

The break shall not originate in the body marking area or weld.

6.3.2.3 Requirements – Fittings

The bursting pressure P_r shall not be less than 2,7 times the maximum allowable pressure PS.

The burst test shall not cause the fitting to fragment.

The break shall not show any obvious defects in the material.

The break shall not originate in the marking area.

6.3.3 Mechanical strength test (crushing test)

6.3.3.1 General

The mechanical strength test shall be carried out in the form of a crushing test used to confirm the ductility of the body.

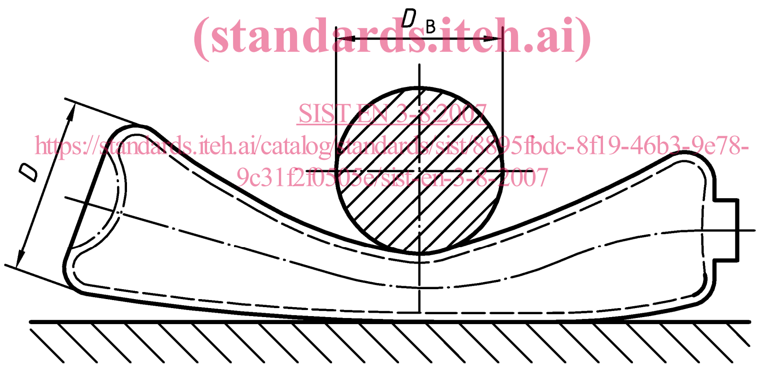
In carrying out the test the mandrel shall be positioned as stated, but such as to minimise the risk of damage to connection points which allow pressurisation of the body. Damage to these points does not constitute failure and alternative means of pressurising the body may be established. A closure shall be fitted prior to the test. Any connection shall not add to the strength of the body during the test.

The length of the body is the maximum distance between the ends of the pressure envelope, excluding any skirt or connection.

6.3.3.2 Long bodies

The method following shall be used when the length of the body is greater than 1,5 D.

The body shall be crushed perpendicularly to its longitudinal axis and approximately in the middle of the body by means of a non-deformable cylindrical mandrel of diameter D_B = (D ± 20) mm and of a length sufficient for each end to overlap the crushed body (see Figure 1).



Key

D nominal external diameter of the body

D_B diameter of the mandrel

Figure 1 — Crushing test for long bodies

The body shall be crushed to (10 ± 1) % of its external diameter. The duration of the movement of the mandrel shall be within a period of 30 s to 60 s.

For bodies with a longitudinal weld, the weld seam shall be at 90° to the support line.

For bodies with a transverse weld, the crushing shall be carried out at an angle of 45° to the weld.

Following the crushing test, the body shall be subjected to the test pressure PT. The body shall not have any cracks or leaks.