



SLOVENSKI STANDARD
SIST EN 3-3:1995
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Prenosni gasilniki - 3. del: Konstrukcija, odpornost proti pritisku, mehanski preskusi

Portable fire extinguishers - Construction, resistance to pressure, mechanical tests

Tragbare Feuerlöscher - Konstruktive Ausführung, Druckfestigkeit, mechanische Prüfungen

Extincteurs d'incendie portatifs - Construction, résistance à la pression, essais mécaniques

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EUROPEAN STANDARD

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NORME EUROPÉENNE

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English version

Portable fire extinguishers - Construction, resistance to pressure, mechanical tests

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Extincteurs d'incendie portatifs - Construction, résistance à la pression, essais mécaniques
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This European Standard was approved by CEN on 1994-01-27. 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.

The European Standards exist 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
 Comité Européen de Normalisation
 Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 70 (secretariat: Belgium).

This European Standard is one part of EN 3 prepared by CEN/TC 70.

The European Standard EN 3 has the general title of "Portable fire extinguishers" and comprises the following different parts:

- Part 1: Designation - Duration of operation -
Class A and B standard fires;
- Part 2: Tightness - Dielectric test - Tamping test -
Special provision
- Part 3: Construction - Resistance to pressure -
Mechanical tests
- Part 4: Charges - Minimum required fires
- Part 5: Specifications and supplementary tests
- Part 6: Provisions for the evaluation of conformity of portable
fire extinguishers to parts 1 to 5 of EN 3

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 September 1994, and conflicting national standards shall be withdrawn at the latest by January 1997.

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According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Switzerland, United Kingdom.

1 Scope

This standard lays down technical specifications for extinguisher bodies and their accessories. It applies to the bodies of extinguishers in which the service pressure does not exceed 25 bar and to propellant gas cartridges.

A specific clause gives requirements relative to carbon dioxide extinguishers bodies.

2 Normative references

This European Standard incorporates by dated or undated references, 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 of revision. For undated reference the latest edition of the publication referred to applies.

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EN 3 - Part 1	Designation - Duration of operation - Class A and B standard fires
EN 3 - Part 2	Tightness - Dielectric test - Tamping test - Special provision
EN 3 - Part 4	Charges - Minimum required fires
EN 3 - Part 5	Specifications and supplementary tests
EN 3 - Part 6	Provisions for the evaluation of conformity of portable fire extinguishers to parts 1 to 5 of EN 3
ISO 4582:1980	Plastics - Determination of changes in colour and variations in properties after exposure to daylight under glass, natural weathering or artificial light
ISO 2604-2:1975	Steel products for pressure purposes - Quality requirements - Part II: Wrought seamless tubes
Dir.84/525	Council directive of 17 september 1984 on the approximation of the laws of the member states relating to seamless, steel gas cylinders
Dir.84/526	Council directive of 17 september 1984 on the approximation of the laws of the member states relating to seamless, unalloyed aluminium and aluminium alloy gas cylinders

3 Definitions

For the purposes of this standard, the following definitions apply:

Body : Shell of the extinguisher not fitted with its accessories but fitted with all its welded parts.

Service pressure : Maximum operating pressure measured at 60°C and 30 s after the release of the propellant inside the extinguisher body.

Bursting pressure : Minimum plastic instability pressure obtained during a bursting test under pressure.

4 Symbols and abbreviations

P_s is the service pressure in bar(1).
 P_h is the test pressure in bar.
 P_r is the bursting pressure in bar.
 R_e is the proof stress given in N/mm² or in MPa.
 R_m is the tensile strength given in N/mm² or in MPa.
 D is the nominal external diameter of the body, or the largest external measurement normal to the longitudinal axis in mm.
 D_B is the diameter of the mandrel used during the crushing test in mm.
 S is the calculated minimum wall thickness of the body in mm.

5 Welded steel bodies

5.1 Materials

5.1.1 The material used in the construction of the extinguisher bodies shall be weldable and shall contain a maximum of 0,25 % carbon, 0,05 % of sulphur and 0,05 % of phosphorus. Before fabrication, the material shall have an elongation

A greater than 16 % and a tensile strength $R_m \leq$:
580 MPa.

(1) 1 bar = 0.1 MPa.

Examples of suitable products are given in table 1 below.

Table 1 : Examples of steel

Steel grades			
EURONORM		ISO	
130	: FePO1	3574	: CR2
130	: FePO2	3574	: CR3
130	: FePO3	3574	: CR4
130	: FePO4	360	: Fe360-D
25	: Fe360-D	2604 T.4	: P26

All parts of the body and those welded to the body shall be made of mutually compatible materials. The filler materials shall be compatible with the steel to give welds with properties equivalent to those specified for the base material.

5.1.2 The body manufacturer shall be capable of providing certificates of the chemical cast analysis of the steels that are supplied to him for the manufacturer of the parts subjected to pressure.

Independent analyses shall be carried out on samples taken either from semi-finished product as supplied to the body manufacturer, or from the body.

The manufacturer shall be capable of providing results from mechanical and metallurgical tests carried on welds and a detailed description of the welding processes that are used during manufacture.

5.1.3 For bodies produced from austenitic steel the maximum carbon content shall be 0,03 %. Type 304L is a suitable example.

5.2 Parts subject to pressure

5.2.1 Minimum wall thickness

The verification of the design of parts subject to pressure shall be by test defined in this standard.

The body shall meet the requirements of the mechanical strength test (crushing test, see 6.2) and the bursting pressure (see 6.1).

The body shall have a measured wall thicknesses greater than the minimum thicknesses calculated using the following formula:

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

where S is the minimum thickness in mm.
 D is the external diameter of the body, or the largest external measurement normal to the longitudinal axis in mm.
 K is the 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.

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

$$S = \frac{D}{600} + K$$

where S is the minimum thickness in mm.
 D is the external diameter of the body, or the largest external measurement normal to the longitudinal axis in mm.
 K is the coefficient, the value of which is
 0,30 for diameters ≥ 100 mm.

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

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5.2.2 Marking of closures

The main closures (covers, plugs, ...) which are or may be subjected to pressure during normal use shall be indelibly marked to permit subsequent identification.

5.3 Construction of bodies

5.3.1 General requirements

On his own responsibility, the manufacturer shall ensure that he has available the manufacturing means and processes suitable for fabricating the bodies in conformity with this standard.

The manufacturer shall ensure that the materials and components used in the fabrication of the body are free from any defect likely to impair the safe use of the extinguisher.

5.3.2 Mounting

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(s) (see 5.2 et 10.3).

5.3.3 Welded parts

Butt welds in the strength envelope shall be formed using an automatic welding procedure and shall not be located in areas where variations of shape exist.

The welds shall be a continuous penetration with no deviation in the weld.

Welds and brazed joints shall be free from defects which may impair the safe use of the body.

Figure 1 shows examples of acceptable welds.

5.3.4 Attached parts

Attached parts shall be made and fixed to the body so not to cause any dangerous stresses or any specific corrosion risks. Non-metallic materials may be used for making attached parts as long as they are sufficient robust.

6 Tests

The tests described in 6.1 and 6.2 shall be carried out on a minimum of 10 bodies. These test are required for unalloy steel body.

6.1 Burst test under pressure

6.1.1 Test requirements

The burst test under pressure shall be carried out using an installation which permits a regular increase of pressure until the body bursts and also permits the variation of pressure to be recorded as a function of time.

6.1.2 Interpretation of results

The bursting pressure P_r shall not be less than 2,7 times the service pressure P_s developed inside the apparatus at the temperature of 60° C, with a minimum of 55 bar.

The burst test shall not cause the body to fragment. The main break shall show no signs of brittleness, i.e. 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 metal. The break shall not originate in the body marking area.

6.1.3 Marking of bodies

The bodies used for the bursting test shall bear all normal markings.