
Prevozni gasilniki - 2. del: Dodatne zahteve k EN 1866-1 za konstrukcijo, odpornost proti tlaku in mehanski preskusi za gasilnike z najvišjim dovoljenim tlakom, enakim ali nižjim od 30 bar

Mobile fire extinguishers - Part 2: Additional requirements to EN 1866-1 for the construction, resistance to pressure and mechanical tests for extinguishers with a maximum allowable pressure equal to or lower than 30 bar

Fahrbare Feuerlöscher - Teil 2: Zusätzliche Anforderungen zu EN 1866-1 an die konstruktive Ausführung, Druckfestigkeit und mechanischen Prüfungen für Feuerlöscher mit einem Höchstdruck kleiner gleich 30 bar

Extincteurs d'incendie mobiles - Partie 2: Exigences complémentaires a celles de l'EN 1866-1 sur la construction, la résistance a la pression et les essais mécaniques des extincteurs dont la pression maximale admissible est inférieure ou égale a 30 bar

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Mobile fire extinguishers - Part 2: Additional requirements to EN 1866-1 for the construction, resistance to pressure and mechanical tests for extinguishers with a maximum allowable pressure equal to or lower than 30 bar

Extincteurs d'incendie mobiles - Partie 2: Exigences complémentaires à celles de l'EN 1866-1 sur la construction, la résistance à la pression et les essais mécaniques des extincteurs dont la pression maximale admissible est inférieure ou égale à 30 bar

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 70.

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Foreword

This document (prEN 1866-2:2006) has been prepared by Technical Committee CEN/TC 70 "Manual means of fire fighting equipment", the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1866:2005.

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/CE.

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

This standard EN 1866 consists of the following parts under the general title "Mobile fire extinguishers":

- Part 1: *Characteristics, performance requirements and test methods*
- Part 2: *Additional requirements to EN 1866-1 for the construction, resistance to pressure and mechanical tests for extinguishers with a maximum allowable pressure equal to or lower than 30 bar*
- Part 3: *Additional requirements to EN 1866-1 for pressure resistance of CO₂ extinguishers*

Annexes A, B, C, D, E are normative. [oSIST prEN 1866-2:2007](https://standards.iteh.ai/catalog/standards/sist/896a24c3-16f5-41a0-9ffb-afl38dd02371/osist-pren-1866-2-2007)

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1 Scope

This European Standard specifies the rules of design, type testing and inspection during manufacturing of mobile water based and foam fire extinguishers as far as pressure risk is concerned. It applies to mobile fire extinguishers with a pressure PS equal or less than 30 bar.

NOTE This standard does not specify any metallic materials which comply with the essential requirements of the Directive 97/23/EEC (PED). Materials that successfully pass the essential requirements of the PED may be used.

2 Normative references

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

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

EN 287-1:2004, *Approval testing of welders – Fusion welding – Part 1: Steels.*

EN 287-2:1992+A1:1997, *Approval testing of welders – Fusion welding – Part 2: Aluminium and aluminium alloys.*

EN 288-2:1992+A1:1997, *Specification and approval of welding procedures for metallic materials – Part 2: Welding procedure specification for arc welding.*

EN 288-3:1992+A1:1997, *Specification and approval of welding procedures for metallic materials – Part 3: Welding procedure tests for the arc welding of steels.*

EN 288-4:1992+A1:1997, *Specification and approval of welding procedures for metallic materials – Part 4: Welding procedure tests for the arc welding of aluminium and its alloys.*

EN 1320, *Destructive tests on welds in metallic materials – Fracture test.*

EN 1418, *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, *Metallic products – Types of inspection documents.*

EN ISO 4892-2, *Plastics – Methods of exposure to laboratory light sources – Part 2: Xenon-arc sources (ISO 4892-2:1994).*

EN 13445, *Unfired pressure vessels – Part 1: General*

Unfired pressure vessels – Part 2: Materials

Unfired pressure vessels – Part 3: Design

Unfired pressure vessels – Part 4: Fabrication

Unfired pressure vessels – Part 5: Inspection and testing

EN 13133, *Brazing – Brazer approval.*

EN 13134, *Brazing – Procedure approval.*

EN ISO 15614-1, *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).*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions in prEN1866-1: 2005 and following definitions apply.

3.1

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} (≥ 60 °C) and for cartridge operated extinguishers, the maximum pressure is the maximum pressure recorded for 0.5 seconds during a period of three minutes, excluding the first five seconds 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 $P_{T_{max}}$

3.3

bursting pressure Pr

maximum pressure measured during a bursting test

3.4

T_{max}

maximum operating temperature declared by the manufacturer

3.5

T_{min}

minimum operating temperature declared by the manufacturer

4 Symbols and abbreviations

For the purposes of this standard, the following symbols and abbreviations apply:

PS The maximum allowable pressure in bar.

PT The test pressure in bar.

D Nominal external diameter of the body, or the largest external value of the perpendicular section of 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.

Pr Bursting pressure in bar.

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T_{\max} The maximum operating temperature, in °C.

$P_{T_{\max}}$ The pressure at maximum operating temperature, in bar.

T_{\min} The minimum operating temperature, in °C.

5 Design and prototype testing

5.1 Calculation design method

EN 13445 Part 1 to 5 is a recognised calculation method. If a body of a mobile fire extinguisher is designed with this recognised calculation method no burst pressure test is required.

5.2 Experimental design method

If a body of a mobile fire extinguisher is designed with a experimental design method a burst test of the body is required.

The wall thickness of the body shall not be less than the wall thickness given by the formula below.

$$S = \frac{D \times PT}{20 \times R} \text{ for the wall thickness of the body.}$$

where

S is the wall thickness, in millimetres;

D is the external diameter of the body in millimetres;

PT is the test pressure, being 1,43 x PS, in bar ;

R is 80 % of the minimum yield strength of the material specified by the manufacturer, in N/mm².

5.3 Prototype testing

5.3.1 Pressure test

5.3.1.1 Test conditions

Two bodies including accessories shall be submitted to the hydrostatic pressure test which shall be carried out using apparatus that permits a regular increase of pressure at a maximum of 2 bar/s up to the moment the test pressure PT is reached.

5.3.1.2 Requirements

The test pressure PT shall not be less than 1,43 times the maximum allowable pressure PS with a minimum of 20 bar.

The test pressure shall be maintained for a minimum of 30 s and the body shall remain tight.

After the test, the volume of the body shall not increase by more than 1 %.

5.3.2 Burst test

5.3.2.1 Test conditions

If the body is not designed in accordance with EN 13445 one sample shall be subjected to a burst test.

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.

5.3.2.2 Requirements - Bodies

The burst pressure P_r shall not be less than 2,7 times the maximum pressure PS 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, for example the edges of the break shall not be radial, but shall be inclined relative to a diametrical 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 or weld.

5.3.2.3 Requirements – Fittings

The bursting test shall be carried out on three samples of all fittings, except for hoses and coupling (see chapter 6.7).

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 valve and fitting to fragment.

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

The break shall not originate in the valve or fitting marking area.

5.4 Macroscopic examination

On two bodies each weld subject to pressure shall be examined, the macroscopic examination of a transverse section of the weld, in accordance with EN 1320, shall show complete fusion over the area with preparation acid and any defects shall be revealed.

If there in any doubt, a microscopic examination of the suspect area shall be carried out.

5.5 Attached parts

Attached parts shall be made so not to cause any dangerous stresses or any specific corrosion risks.

5.6 Overfill pressure test

This test is required for water based extinguishing media cartridge operated extinguishers only.

One extinguisher when tested in accordance with Annex E shall not eject any components.

5.7 Requirements for components subject to pressure

5.7.1 Test conditions

Two samples of each type of component subject to internal pressure shall be submitted to the pressure test which shall be carried out using apparatus that permits a regular increase of pressure at a maximum of 2 bar/s up to the moment the test pressure P_T is reached.

5.7.2 Requirements

The test pressure P_T shall not be less than 1,43 times the maximum allowable pressure P_S with a minimum of 20 bar.

The test pressure shall be maintained for a minimum of 30 s and the components shall not leak.

After the test, the components shall not show any visible sign of permanent deformation.

6 Materials

6.1 Materials for bodies

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

6.2 Materials for operating devices and filling caps

The metallic material of any operating devices and filling caps shall be compatible with other products and shall have an appropriate certificate such as EN 10204 test report 2.2.

In case of plastic materials, components are subject to the tests in Annex B.

6.3 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.

Plastic components shall fulfil the clauses of Annex B except hoses, pistols and nozzles.

7 Hose assembly and attached components

7.1 Requirements

The hose assembly and attached components shall function throughout the operating temperature range, and coupling systems shall be designed and fitted in such a way that they cannot damage the hose.

7.2 Prototype testing

When tested in accordance with Annex E, the bursting pressure of the hose shall conform to :

- three times the maximum allowable pressure P_S , the test being carried out at $(20 \pm 5) ^\circ\text{C}$;
- twice $P(T_{\text{max}})$, the test being carried out at $(T_{\text{max}} \pm 2) ^\circ\text{C}$ and at $(T_{\text{min}} \pm 2) ^\circ\text{C}$

8 Manufacturing

8.1 General requirements

The manufacturer shall ensure that they have available the manufacturing means and processes suitable for fabricating the bodies in accordance with this document.

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.

8.2 Welded and brazed parts

8.2.1 General

Butt welds in the strength envelope shall be formed using an automatic welding procedure. Welds and brazed joints shall be free from defects which may impair the safe use of the body.

8.2.2 Welding procedures

The weld design and the welding procedures shall be described in a welding procedure specification in accordance with EN 288-2 and shall be qualified in accordance with EN 288-3 or EN 288-4.

8.2.3 Welding personnel

The welders shall be qualified in accordance with EN 287-1 or EN 287-2 and the operators in accordance with EN 1418.

8.2.4 Brazing procedures

The braze design and the brazing procedures shall be described in a brazing procedure specification in accordance with EN 13134.

8.2.5 Brazing personnel

The brazers shall be qualified in accordance with EN 13133.

8.3 Traceability

8.3.1 Pressure retaining parts

The identification and the control of the materials for all pressure retaining parts shall be such as to ensure that the materials used in manufacture meets the specification of the design.

This is realised by application of adequate procedures, internal to the manufacturer such as batch control.

8.3.2 Operating devices, filling caps and hose assemblies

The operating devices, filling caps and hose assemblies which are or may be subjected to pressure during normal use shall be indelibly marked to permit subsequent identification and traceability.