

norm

NEN-EN 1866-2

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

Publicatie uitsluitend voor commentaar

januari 2007
ICS 13.220.10

Commentaar voor 2007-04-14

Zal vervangen NEN-EN 1866:2006,deels

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December 2006

ICS

Will supersede EN 1866:2005

English Version

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.

If this draft becomes a European Standard, 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.

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Contents

Page

Foreword.....	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	5
4 Symbols and abbreviations	5
5 Design and prototype testing	6
5.1 Calculation design method	6
5.2 Experimental design method	6
5.3 Prototype testing	6
5.4 Macroscopic examination	7
5.5 Attached parts	7
5.6 Overfill pressure test	7
5.7 Requirements for components subject to pressure	8
6 Materials	8
6.1 Materials for bodies	8
6.2 Materials for operating devices and filling caps	8
6.3 Materials for other components	8
7 Hose assembly and attached components	8
7.1 Requirements	8
7.2 Prototype testing	8
8 Manufacturing	9
8.1 General requirements	9
8.2 Welded and brazed parts	9
8.3 Traceability	9
9 Inspection and testing during manufacturing	10
9.1 Extinguisher bodies	10
9.2 Accessories and fittings (excluding pressure relief devices and fittings to be ruptured on over pressure)	10
9.3 Assemblies	10
Annex A (informative) Classification of the different parts of an extinguisher subject to internal pressure	11
Annex B (normative) Specifications for plastics components (except hoses, pistols and nozzles)	12
Annex C (normative) Symbols of pressures	15
Annex D (normative) Overfill Pressure Test	16
Annex E (normative) Test for burst pressure of hose assembly and attached components	17
Annex ZA (informative) Relationship between this European Standard and the essential requirements of EU Directive 97/23/EC	18
Bibliography	19

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 formative.

Preview

prEN 1866-2

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_{Tmax} (Pressure experimentally measured)

pressure measured in the extinguisher after stabilisation during at least 24 h at maximum operating temperature ($T_{max} \geq 60 \text{ }^\circ\text{C}$) 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_{Tmax}

3.3

bursting pressure P_r

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.

P_r Bursting pressure in bar.

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 \times 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 is 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.

Bestelformulier

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