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**Prenosni gasilniki - 8. del: Dodatne zahteve k EN 3-7 za konstrukcijo, tlačna odpornost in mehanski preskusi za gasilnike z največjim dovoljenim tlakom, enakim ali nižjim od 30 bar, v skladu z zahtevami standarda EN 3-7**

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

Tragbare Feuerlöscher - Teil 8: Anforderungen an die konstruktive Ausführung, Druckfestigkeit und mechanischen Prüfungen für tragbare Feuerlöscher mit einem Höchstdruck kleiner gleich 30 bar, welche die Anforderungen aus EN 3-7 erfüllen

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

**Ta slovenski standard je istoveten z: prEN 3-8**

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

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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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EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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**prEN 3-8:2013 (E)****Foreword**

This document (prEN 3-8:2013) 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 3-8:2006.

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(s).

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 (series EN 1866).

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

- *Part 7: Characteristics, performance requirements and test methods*
- *Part 8: Requirements for the construction; pressure resistance and mechanical tests for extinguishers with a maximum allowable pressure equal to or less lower than 30 bar, which comply with the requirements of EN 3-7*
- *Part 9: Requirements for the assembly, construction and pressure resistance of CO<sub>2</sub> extinguishers which comply with the requirements of EN 3-7*
- *Part 10: Provisions for evaluating the conformity of a portable fire extinguisher to EN 3-7*

Annexes B, C, D, E, F and G are normative; Annexes A and ZA are informative.

**List of major changes:**

The following sections have been revised:

- scope;
- materials;
- permanent joining;
- relationship with the ESR's;
- relationship and titles to EN 3 series.

## 1 Scope

This European Standard specifies the rules of design, type testing, fabrication and inspection control of portable fire extinguishers which comply with the requirements of EN 3-7; with metallic bodies as far as pressure risk is concerned.

This part of EN 3 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) 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 documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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+A1:2007, *Portable fire extinguishers — Part 7: Characteristics, performance requirements and test methods*

EN 287-1:2011, *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<sup>1)</sup>, *Metallic products — Types of inspection documents*

EN ISO 4892-2:2006, *Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps (ISO 4892-2:2009)*

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)*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 3-7:2004+A2007 and the following apply.

NOTE Schemes illustrating the different pressures and temperatures is given in Annex B.

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

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### 3.1 maximum pressure at maximum operating temperature pressure experimentally measured

$P(T_{\max})$

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 maximum declared pressure

$PS$

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 1 to entry: 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  $TS_{\max}$

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### 3.6 minimum operating temperature

$T_{\min}$

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

### 3.7 portable fire extinguisher

fire extinguisher which is designed to be carried and operated by hand and which in working order has a mass of not more than 20 kg

### 3.8 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 1 to entry: In the ADR these are classified as cylinders (definition 1.2).

### 3.9 fittings

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

Note 1 to entry: 1 bar =  $10^5$  Pa = 0,1 MPa.

## 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 = $1,43^* \times PS$ in bar
$P_r$	Bursting pressure (measured) - in bar
$D$	Nominal external diameter of the body, or the largest external value of the perpendicular section to the axis, in mm
$D_B$	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 °C
$T_{\min}$	Minimum operating temperature declared by the manufacturer, in °C
$S$	Minimum wall thickness, in mm
$TS_{\min}$	Minimum allowable temperature, in °C
$TS_{\max}$	Maximum allowable temperature, in °C
$R_m$	Ultimate tensile strength*, in MPa (N/mm <sup>2</sup> ) <small>oSIST prEN 3-8:2014  <a href="https://standards.iteh.ai/catalog/standards/sist/240385d1-2347-4b74-9447-70b6aad1a2ae/osist-pren-3-8-2014">https://standards.iteh.ai/catalog/standards/sist/240385d1-2347-4b74-9447-70b6aad1a2ae/osist-pren-3-8-2014</a></small> <i>*(as denoted on the material certificate received from the raw material supplier)</i>
$R_{mf}$	Ultimate tensile strength*, in MPa (N/mm <sup>2</sup> ) <i>*(guaranteed by the manufacturer after all manufacturing processes have been carried out on the final product)</i>

## 5 Materials

The materials shall be suitable for the intended use. All materials used in the extinguisher assembly shall be compatible with all other components including extinguishing media. Assemblies shall meet the requirements of EN 3-7 Clause 14.1 Resistance to external corrosion and additionally for water based media EN 3-7+A1 Clause 14.2 Resistance to extinguishing medium of extinguishers using water based media.

The materials used for pressure bearing parts shall be defined in a detailed specification which forms an integrated part of the design.

This specification shall contain at least detailed descriptions of:

- all raw materials used, including the normal production tolerances;
- all processes used, the process parameters and the normal admissible process tolerances;
- the relevant required material properties after processing.

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The materials used for non-pressure bearing parts and accessories of extinguishers shall be compatible with the materials used for the pressure bearing parts.

Plastic components shall fulfil the clauses of Annex D except hoses and nozzles.

For the materials, used in the type testing and type approval, inspection documents in accordance with Annex H shall be provided.

Particular attention shall be given to incompatibilities produced for example by:

- galvanic corrosion;
- stress corrosion;
- electrolytic corrosion.

**6 Design method – Bodies**

NOTE For requirements for Gas Cartridges see Annex E.

**6.1 General****6.1.1 Design**

The design shall be by calculation and verified by experimental data, see Clause 7.

**6.1.2 Temperature range**

The allowable temperature range declared for the body shall be  $TS_{\min}$  to  $TS_{\max}$  where:

- $TS_{\min} = -30^{\circ}\text{C}$  or lower as declared by the manufacturer.
- $TS_{\max} = +60^{\circ}\text{C}$  or higher as 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 and the new parameters at these temperatures.

**6.2 Calculation****6.2.1 Bodies – Requirements for the body**

The body shall have a measured wall thickness which is equal to or greater than the wall thickness calculated using the following formula:

$$S = \frac{(2,7 \times PS) \times D}{20R_{mf} + (2,7 \times PS)}$$

**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 (base) by at least 5 mm above the horizontal surface or the thickness of metal in the base of the body in contact with the horizontal surface shall be at least the minimum wall thickness  $S+0.5$  mm as calculated in 6.2.1.

### 6.3 Bodies – Required for use with plastic components

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

## 7 Prototype Testing

NOTE For requirements for Gas Cartridges see Annex E.

### 7.1 General

The design verification shall be by prototype testing.

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

### 7.2 Burst Test – low temperature

#### 7.2.1 General

The burst test shall be carried out to confirm the adequate strength of the body.

#### 7.2.2 Bodies

##### 7.2.2.1 Conditions <https://standards.iteh.ai/catalog/standards/sist/240385d1-2347-4b74-9447-70b6aad1a2ae/osist-pren-3-8-2014>

A minimum of three specimens shall be used.

Tests shall be carried out at  $T_{S_{min}}$  (+0, - 2) °C.

A burst of the body, 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.

##### 7.2.2.2 Requirements

- 1) In all tests  $P_r$  shall be greater than  $2,7 \times PS$ ;
- 2) the burst test shall not cause the body to fragment;
- 3) 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;
- 4) the break shall not show any obvious defects in the material;
- 5) the break shall not originate in the body marking area or weld;

NOTE 1 The heat affected zone is not considered to be in or part of the weld.

NOTE 2 Should the fracture cross the weld from its point of origin it shall not be considered a failure.

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- 6) the burst pressure test are carried out at the specified pressures, in the event that a sealing “O” ring or washer moves out of its housing before burst pressure is reached, this shall not be caused by deformation of the valve or the neck ring, then a fitting shall be devised to enable the burst test to be completed.

**7.2.3 Fittings****7.2.3.1 Conditions**

A minimum of three specimens shall be used.

Tests shall be carried out at  $TS_{\min}$  (+0, -4) °C.

A burst of the body, 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 fitting bursts and also permits the variation of pressure to be recorded as a function of time.

**7.2.3.2 Requirements**

The bursting pressure  $P_r$  shall:

- 1) not be less than 2,7 times the maximum allowable pressure  $P_s$ ;
- 2) the burst test shall not cause the fitting to fragment;
- 3) the break shall not show any obvious defects in the material;
- 4) the break shall not originate in the marking area.

**7.3 Crushing Test – low temperature (bodies only)****7.3.1 General**

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

**7.3.2 Conditions**

A minimum of three specimens shall be used.

Tests shall be carried out at  $TS_{\min}$  (+0, -4) °C in accordance with Annex G.

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).