SLOVENSKI STANDARD

SIST EN 3-7:2004+A1:2008

01-februar-2008

Prenosni gasilniki - 7. del: Lastnosti, zahteve za obnašanje v uporabi in preskusne metode

Portable fire extinguishers - Part 7: Characteristics, performance requirements and test methods

Tragbare Feuerlöscher - Teil 7: Eigenschaften, Leistungsanforderungen und Prüfungen

Extincteurs d'incendie portatifs - Partie 7: Caractéristiques, performances et méthodes d'essai

Ta slovenski standard je istoveten z: **EN 3-7:2004+A1:2007**

ICS:

13.220.10

SIST EN 3-7:2004+A1:2008 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 3-7:2004+A1

August 2007

ICS 13.220.10

Supersedes EN 3-7:2004

English Version

Portable fire extinguishers - Part 7: Characteristics, performance requirements and test methods

Extincteurs d'incendie portatifs - Partie 7: Caractéristiques, performances et méthodes d'essai

Tragbare Feuerlöscher - Teil 7: Eigenschaften, Leistungsanforderungen und Prüfungen

This European Standard was approved by CEN on 5 March 2003 and includes Amendment 1 approved by CEN on 30 June 2007.

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 CEN Management Centre 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 CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, 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.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 3-7:2004+A1:2007: E

Contents

Foreword

This document (EN 3-7:2004+A1:2007) has been prepared by Technical Committee CEN/TC 70 “Manual means of firefighting equipment”, the secretariat of which is held by AFNOR.

This document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2008 and conflicting national standards shall be withdrawn at the latest by February 2008.

This document includes Amendment 1, approved by CEN on 2007-06-30.

This document supersedes EN 3-7:2004.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ⟨A1⟩ ⟨A1⟩.

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

⟨A1⟩ *deleted text* ⟨A1⟩

— *Part 6[1)]: 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: Additional requirements to EN 3-7 for the construction, resistance to pressure and mechanical tests for extinguishers with a maximum allowable pressure equal or lower than 30 bar*

— *Part 9: Additional requirements to EN 3-7 for pressure resistance of CO_2 extinguishers*

— *Part 10[2)]: Provisions valuating 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, Bulgaria, 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) EN 3-6 will be superseded by EN 3-10.

2) EN 3-10 will update and amend EN 3-6. EN 3-10 will supersede EN 3-6.

1 Scope

This standard specifies the characteristics, performance requirements and test methods for portable fire extinguishers.

Reference to the suitability of an extinguisher for use on gaseous fires (class C fires) are at the manufacturer's discretion, but are applied only to powder type extinguishers which have gained a class B or class A and class B rating.

Suitability of extinguishers for use on class D fires (fires involving flammable metals) is outside the scope of this standard in respect of test fires. However, extinguishers claiming class D suitability are covered in all other respects by the requirements in this standard for powder extinguishers.

〚A1〛 It is considered hazardous for powder and carbon dioxide fire extinguishers to be used on Class F fires. For this reason powder and carbon dioxide fire extinguishers are excluded for conformance with regard to Class F in this European Standard. 〚A1〛

NOTE The extinction of a metal fire presents a situation so specific (in terms of the metal itself, its form, the configuration of the fire etc.) that it is not possible to define a representative standard fire for the purposes of testing. The efficiency of extinguishers on class D fires needs to be established on a case by case basis.

2 Normative references

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

EN 2, *Classification of fires*

ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

ISO 657-1, *Hot-rolled steel sections — Part 1: Equal-leg angles — Dimensions*

ISO 4470, *Sawn timber — Determination of the average moisture content of a lot*

Farbregister RAL-841-GL.

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1
fire extinguisher
appliance containing an extinguishing medium which can be expelled by the action of internal pressure and be directed on to a fire

NOTE This pressure can be stored pressure or pressure produced by the release of an auxiliary gas from a cartridge.

3.2
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

NOTE Throughout this standard it is referred to as an "extinguisher"

3.3
clean agent
electrically non-conducting, volatile, or gaseous fire extinguishing medium that does not leave a residue upon evaporation

NOTE Examples are fluorocarbons (FCs), perfluorocarbons (PFCs) and fluoroiodocarbons (FICs).

3.4
halon
agent that contains as primary components one or more organic compounds containing one or more of the elements fluorine, chlorine, bromine, or iodine

3.5
body
shell of the extinguisher not fitted with its accessories but fitted with all its welded/brazed parts

3.6
extinguishing medium
substance contained in the extinguisher which causes extinction of a fire

3.7
charge
mass or volume of the extinguishing medium contained in the extinguisher, expressed as a volume (in litres) for water based extinguishers and as a mass (in kilograms) for other extinguishers

3.8
water based extinguisher
〚A1〛 extinguisher containing water, water with additive or wet chemical

NOTE This also includes foam. 〚/A1〛

3.9
powder extinguisher
extinguisher containing fire extinguishing powder

3.10
carbon dioxide extinguisher
extinguisher containing carbon dioxide

3.11
halon extinguisher
extinguisher containing halon

3.12
clean agent extinguisher
extinguisher containing a clean agent

3.13
duration of operation
time during which the extinguishing medium is discharged, without any interruption in the discharge and with the valve fully opened not including discharge of the residual propellant gas

3.14
residual charge
mass of medium remaining after continuous complete discharge including all propellant gas

3.15
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 (which is ≥ 60 °C) 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.

3.16
T_{max}
maximum operating temperature declared by the manufacturer (see 7.4.1)

3.17
T_{min}
minimum operating temperature declared by the manufacturer (see 7.4.1)

4 General

4.1 Description of a portable fire extinguisher

4.1.1 A portable fire extinguisher is described by the type of extinguishing medium it contains. At present, there are:

— water based, including foam [A1] and wet chemical [A1] extinguishers (see Note 1);

— powder type extinguishers;

— carbon dioxide type extinguishers;

— halon type extinguishers (see Note 2);

— clean agent extinguishers.

NOTE 1 Water based extinguishers can be produced with or without a low freeze depressant.

Water based extinguishers, including foam, containing different proportions of low freeze depressant shall be treated as separate and distinct models for the purposes of testing the range of operating temperatures (see 7.4.2) and electrical conductivity (see clause 9), and fire rating tests. All other requirements relating to the design and construction of water based extinguishers are applicable to all models irrespective of content.

NOTE 2 Attention is drawn to European Council Regulation 2037/2000 concerning the use of halons.

4.1.2 A portable fire extinguisher consists of the following components:

a) body (see **3.5**);

b) body fittings, which are fixed to or screwed onto the body, and include at least the following:

— control device(s) (see 4.2, 4.3 and 10.1);

— hose assembly (see 4.4) and/or horns and/or nozzles;

— head assembly. This also constitutes the main closure (see 6.3);

— operating device (see 4.3).

NOTE The head assembly, operating device and control device(s) can be separate or may be incorporated in a single unit.

c) media (see 4.1.1):

4.2 Control of discharge

Portable fire extinguishers shall be fitted with a self-closing control valve to enable the discharge to be interrupted temporarily (see **10.6**).

4.3 Operating position

Extinguishers shall operate without being turned over to an inverted position. The operating device of an extinguisher shall be located on the top of the extinguisher. A control device at the end of the hose shall be permitted. Hand wheel controls of the valve on external propellant cartridges shall be located on the top 60 % of the extinguisher body.

4.4 Hose assembly

Extinguishers having a mass of extinguishing medium greater than 3 kg, or a volume of extinguishing medium greater than 3 l shall be provided with a discharge hose.

The length of the flexible section of the hose assembly shall be 400 mm or greater.

When an extinguisher having a mass of extinguishing medium less than or equal to 3 kg, or a volume of extinguishing medium less than or equal to 3 l is fitted with a discharge hose, the hose assembly shall have a minimum overall length of 250 mm.

4.5 Propellants

Only propellants listed in Table 1 or mixtures thereof, shall be used. The maximum water content shall be as specified in Table 1, except when used in stored pressure water based extinguishers. Tracers may be added to the propellant to facilitate leakage detection, but the tracer need not be indicated in the marking.

Table 1 — Permitted propellants

Propellant	Maximum water content mass fraction, %
Air	0,006
Argon	0,006
Carbon dioxide	0,015
Helium	0,006
Nitrogen	0,006

4.6 Stored pressure extinguishers

Stored pressure extinguishers, except carbon dioxide, shall have a means of checking the presence of pressure, see clause 8 and clause 11.

5 Testing of portable fire extinguishers

Extinguishers for testing shall be stored for at least 24 h at a temperature of (20 ± 5) °C before the tests are carried out and shall be maintained within this temperature range until tested. Tests shall be carried out within 5 min of its removal from storage.

Powder extinguishers shall be subjected to the compaction procedure given in Annex K before the storage period preceding the duration of operation test and the control valve test, and before the fire performance test. Water based extinguishers shall be subjected to the compaction procedure according to Annex K only before the storage period preceding the duration of operation test.

6 Nominal charges, filling tolerances and minimum fire performance

6.1 Nominal charges

Nominal charges of portable fire extinguishers shall be equal to one of the values given in Tables 3 to 8 according to the nature of the extinguishing medium.

6.2 Filling tolerances

The actual charge of the extinguisher shall be equal to the nominal charge within the tolerances given in Table 2.

Table 2 — Filling tolerances

Extinguishing medium	Relative tolerance %
Powder	
1 kg	± 5
2 kg	± 3
≥ 3 kg	± 2
All other media	0 - 5

6.3 〈A1〉 Design of the filling opening, excluding carbon dioxide fire extinguishers

The filling opening shall have a minimum diameter of:

— 20 mm for extinguishers with a charge of less than or equal to 3 kg or 3 l;

— 25 mm for extinguishers with a charge of more than 3 kg or 3 l.

The main closure of the filling opening, intended to be removed during service or maintenance, shall be provided with an automatic means of venting any residual pressure from the extinguisher. The initial venting of any residual pressure shall occur when the means of securing the closure, or pressure retaining part, is disengaged by not more than one third of full engagement. 〈A1〉

6.4 Minimum fire ratings

6.4.1 General

Fire classes are defined in EN 2.

The minimum fire ratings are specified in [A1] Tables 3 to 8 and L.2 [A1], according to the type of extinguishing medium and the charge.

Fire performance shall be tested in accordance with clause 15, and the extinguisher shall attain a class A rating, a class B rating or both as specified in the relevant table, in accordance with the rating claimed by the manufacturer. [A1] Class F extinguishers shall attain a class F rating and may optionally have a class A and/or class B rating. [A1]

EXAMPLE A powder extinguisher for which the manufacturer wishes to claim class A and class B ratings achieves, for the size with a 9 kg charge, a minimum fire rating of 27A and 144B.

Clean agent extinguishers shall have a minimum fire rating of 5A and/or 21B for extinguishers with charges in the range 1 kg, 2 kg, 3 kg, 4 kg, 6 kg, 9 kg and 12 kg.

6.4.2 Ratings for class A fires

Fire ratings of extinguishers for class A fires are given in Tables 3 and 4.

NOTE The numbers in the first column of each table refer to the size of the test fire (see Annex I).

Table 3 — Fire ratings, minimum duration of operation and nominal charges for powder extinguishers

Fire rating	Minimum duration of operation	Nominal permitted charges
	s	kg
5A	6	1
8A	6	1, 2
13A	9	1, 2, 3, 4
21A	9	1, 2, 3, 4, 6
27A	9	1, 2, 3, 4, 6, 9
34A	12	1, 2, 3, 4, 6, 9
43A	15	1, 2, 3, 4, 6, 9, 12
55A	15	1, 2, 3, 4, 6, 9, 12

Table 4 — Fire ratings, minimum duration of operation and nominal charges for water based extinguishers, including foam extinguishers

Fire rating	Minimum duration of operation	Nominal permitted charges
	s	l
5A	6	2, 3
8A	9	2, 3, 6
13A	9	2, 3, 6, 9
21A	9	2, 3, 6, 9
27A	12	2, 3, 6, 9
34A	15	2, 3, 6, 9
43A	15	2, 3, 6, 9
55A	15	2, 3, 6, 9

6.4.3 Ratings for class B fires

Minimum fire ratings of extinguishers for class B fires are given in Tables 5, 6, 7 and 8.

〈A1〉 Water based fire extinguishers claiming suitability for use on polar solvent shall additionally pass the tests specified in Annex M and shall be marked accordingly. 〈A1〉

NOTE The numbers in the first column of each table refer to the size of the test fire (see Annex I).

Table 5 — Fire ratings, minimum duration of operation and nominal charges for powder extinguishers

Fire rating	Minimum duration of operation s	Nominal permitted charges kg
21B	6	1
34B	6	1, 2
55B	9	1, 2, 3
70B	9	1, 2, 3, 4
89B	9	1, 2, 3, 4
113B	12	1, 2, 3, 4, 6
144B	15	1, 2, 3, 4, 6, 9
183B	15	1, 2, 3, 4, 6, 9, 12
233B	15	1, 2, 3, 4, 6, 9, 12

Table 6 — Fire ratings, minimum duration of operation and nominal charges for water based extinguishers, including foam extinguishers

Fire rating	Minimum duration of operation s	Nominal permitted charges l
34B	6	2
55B	9	2, 3
70B	9	2, 3
89B	9	2, 3
113B	12	2, 3, 6
144B	15	2, 3, 6
183B	15	2, 3, 6, 9
233B	15	2, 3, 6, 9

Table 7 — Fire ratings, minimum duration of operation and nominal charges for CO_2 extinguishers

Fire rating	Minimum duration of operation s	Nominal permitted charges kg
21B	6	2
34B	6	2
55B	9	2, 5
70B	9	2, 5
89B	9	2, 5
113B	12	2, 5
144B	15	2, 5
183B	15	2, 5
233B	15	2, 5

Table 8 — Fire ratings, minimum duration of operation and nominal charges for halon extinguishers

Fire rating	Minimum duration of operation s	Nominal permitted charges kg
21B	6	1
34B	6	1, 2
55B	9	1, 2, 4
70B	9	1, 2, 4, 6
89B	9	1, 2, 4, 6
113B	12	1, 2, 4, 6
144B	15	1, 2, 4, 6
183B	15	1, 2, 4, 6
233B	15	1, 2, 4, 6

7 Duration of operation, residual charge and operating temperatures

7.1 Duration of operation

7.1.1 Minimum duration

The duration of operation shall be greater than or equal to the appropriate value given in ⟨A1⟩ Tables 3 to 8 and L.2 ⟨A1⟩ when the portable fire extinguisher is tested according to Annex A after being subjected to the compaction procedure in accordance with Annex K (see clause 5).

7.1.2 Spread of measurements

When three extinguishers are tested in accordance with Annex A, after being subjected to the compaction procedure in accordance with Annex K (see clause 5), the duration of operation of each extinguisher shall be within 15 % of the average value.

7.2 Residual charge

The residual charge (see 3.14) of extinguishing medium shall not be more than 10 % of the nominal charge when the extinguisher is tested in accordance with Annex A after being subjected to the compaction procedure in accordance with Annex K (see clause 5).

7.3 Commencement of discharge

When tested in accordance with Annex A, after being subjected to the compaction procedure in accordance with Annex K, all extinguishers shall operate within 4 s of the control valve being opened. When testing extinguishers pressurised by a separate action, the control valve shall be operated within 6 s after activation.

7.4 Effective range of operating temperature

7.4.1 T_{max} and T_{min} claimed by the manufacturer shall be used for the tests in 7.4.2 and Annex B.

7.4.2 Extinguishers shall be able to operate between T_{max} and T_{min}:

— T_{max} for all extinguishers shall be 60 °C or higher;

— T_{min} excluding water based extinguisher, shall be - 20 °C, - 30 °C or lower;

— T_{min} for water based extinguishers shall be + 5 °C, 0 °C, - 5 °C, - 10 °C, - 15 °C, - 20 °C, - 25 °C, - 30 °C or lower. For water based extinguishers without any protection against freezing T_{min} shall be + 5 °C.

When tested at T_{max} and T_{min} temperature limits, in accordance with Annex B, extinguishers shall conform to the following requirements:

— the discharge shall commence within 10 s of the opening of the control valve;

— except for CO_2 extinguishers, the duration of operation shall be not more than twice the value established at a temperature of 20 °C. CO_2 extinguishers shall conform to 7.4.3;

— the duration of operation shall be not less than 6 s;

— the residual charge shall be not more than 15 % of the nominal charge for extinguishers containing BC type powder, and not more than 10 % of the nominal charge for extinguishers containing other media.

7.4.3 The duration of operation of CO_2 extinguishers shall be as follows.

At T_{max} the duration of operation shall be not more than the value established at a temperature of 20 °C.

At the minimum operating temperature, T_{min}, the duration of operation shall be not more than 2,5 times the value established at 20 °C.