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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

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 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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COMITÉ EUROPÉEN DE NORMALISATION
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Contents

Page

European foreword	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions	5
4 General.....	7
4.1 Description of an extinguisher.....	7
4.2 Control of discharge.....	8
4.3 Operating position.....	8
4.4 Hose assembly.....	8
4.5 Propellants.....	9
4.6 Internal pressure of stored pressure extinguishers	9
4.7 Maximum mass.....	9
4.8 Serviceability.....	9
5 Nominal charges, filling tolerances, design of filling opening.....	9
5.1 Nominal charges.....	9
5.2 Filling tolerances.....	9
5.3 Design of the filling opening, excluding carbon dioxide fire extinguishers	10
6 Testing of extinguishers	10
6.1 General.....	10
6.2 Minimum fire ratings.....	11
6.2.1 General.....	11
6.2.2 Ratings for Class A fires	11
6.2.3 Ratings for Class B fires	12
6.2.4 Ratings for Class F fires.....	14
6.3 Duration of operation, residual charge	14
6.3.1 Duration of operation.....	14
6.3.2 Residual charge	14
6.3.3 Commencement of discharge	14
6.4 Minimum range of operating temperature	15
7 Retention of propellant	15
7.1 Verification.....	15
7.1.1 General.....	15
7.1.2 Weighing.....	15
7.1.3 Pressure measuring methods.....	15
7.2 Acceptance levels	16
7.3 Production leak tests.....	16
8 Dielectric test for the discharge of extinguishers	16
8.1 General.....	16
8.2 Class F fire extinguishers	16
8.3 Dielectric performance.....	17
9 Requirements for components	17
9.1 General.....	17
9.2 Operation and control device(s)	17

9.3	Safety devices	17
9.4	Hose, hose connectors and nozzle	18
9.4.1	General	18
9.4.2	Hose resistance test	18
9.5	Control valve	18
10	Means of pressure indication	19
10.1	Pressure gauge	19
10.2	Pressure indicator	20
11	Horns for carbon dioxide extinguishers	20
12	Extinguisher wall bracket	21
13	Resistance to corrosion	21
13.1	Resistance to external corrosion/deterioration	21
13.2	Resistance to extinguishing medium of extinguishers using water based and gaseous extinguishing media	22
13.3	Material compatibility	22
14	Fire performance	22
14.1	General	22
14.2	Class A fire rating	22
14.3	Class B fire rating	22
14.4	Class F fire rating	22
15	Extinguisher identification	23
15.1	Colour	23
15.2	Marking	23
16	Maintenance	27
17	Documentation	27
Annex A (normative) Duration of operation, residual charge tests		28
Annex B (normative) Range of operating temperature		29
Annex C (normative) Dielectric test		30
Annex D (normative) Operation and emission control mechanisms/devices		32
Annex E (normative) Test for performance of the hose		33
Annex F (normative) Control valve test		34
Annex G (normative) Test on the horn		35
Annex H (normative) Resistance to corrosion		36
Annex I (normative) Fire tests		37
Annex J (normative) Measurement of moisture content of wood		49
Annex K (normative) Compaction/shock procedure		50
Annex L (normative)		52
Bibliography		53

European foreword

This document (prEN 3-7:2025) has been prepared by Technical Committee CEN/TC 70 “Manual means of firefighting equipment”, the secretariat of which is held by AFNOR.

This document will supersede EN 3-7:2004+A1:2007.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

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 lower than 30 bar, which comply with the requirements of EN 3-7*
- *Part 9: Additional requirements to EN 3-7 for pressure resistance of CO₂ extinguishers*
- *Part 10: Provisions for evaluating the conformity of a portable fire extinguisher to EN 3-7*

1 Scope

This document 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 document in respect of test fires. However, extinguishers claiming Class D suitability are covered in all other respects by the requirements in this document for powder extinguishers.

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 document.

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 is established on a case by case basis.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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*

EN 615, *Fire protection — Fire extinguishing media — Specifications for powders (other than class D powders)*

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp/>
- IEC Electropedia: available at <https://www.electropedia.org/>

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 in a controlled manner

Note 1 to entry: This pressure can be stored pressure or pressure produced by the release of an auxiliary gas from a cartridge.

Note 2 to entry: Pay attention consistency with EN 1866-1.

3.2

portable fire extinguisher

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

Note 1 to entry: Throughout this document it is referred to as an “extinguisher”.

3.3

gaseous extinguishing medium

volatile gaseous fire extinguishing medium that does not leave a residue upon evaporation

3.4

body

part of the extinguisher that contains a pressurised extinguishing media immediately prior to discharge including all pressure retaining materials and permanent joints, but excluding any detachable accessories, such as hoses, valves and closures

3.5

extinguishing medium

substance contained in the extinguisher intended to extinguish a fire

3.6

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

Note 1 to entry: Propellants are not considered to be part of the charge.

3.7

water-based extinguisher

extinguisher containing either water, water with additive(s)

Note 1 to entry: This also includes foam and wet chemical.

3.8

powder extinguisher

extinguisher containing fire extinguishing powder

3.9

carbon dioxide extinguisher

extinguisher containing carbon dioxide

3.10

gaseous media extinguisher

extinguisher containing a gaseous extinguishing medium excluding CO₂ (may be referred to as clean agents)

3.11

duration of operation

time during which the extinguishing medium is discharged with the valve fully open without interruption not including discharge of residual gas

Note 1 to entry: Pay attention consistency with EN 1866-1.

3.12**residual charge**

quantity of medium remaining after continuous complete discharge including all propellant gas

3.13**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 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

Note 1 to entry: Pay attention consistency with EN 1866-1.

3.14**pressure at minimum operating temperature $P(T_{\min})$**

pressure measured in the extinguisher after stabilisation during at least 24 h at minimum operating temperature

Note 1 to entry: This pressure is only measured on stored pressure extinguishers.

3.15**maximum operating temperature** **$T_{\max}$**

maximum operating temperature declared by the manufacturer

3.16**minimum operating temperature** **$T_{\min}$**

minimum operating temperature declared by the manufacturer

3.17**body cover**

a non-pressure bearing cover that covers all or part of the body not including the foot ring/footstand

3.18**clean agent**

agent that evaporates after use (excluding water and CO₂)

Note 1 to entry: Clean is not dealing with environmental or toxicological purposes, regulated by laws.

4 General**4.1 Description of an extinguisher**

4.1.1 An extinguisher is categorized by the type of extinguishing medium it contains. At present, there are:

- water based;
- powder extinguishers;
- carbon dioxide extinguishers;
- gaseous extinguishing media extinguishers included clean agent.

NOTE Examples of such media are given in the EN 15004 series.

Water based extinguishers, containing different proportions of low freeze depressant shall be treated as separate and distinct models.

4.1.2 An extinguisher consists of the following main components:

- a) body with all accessories (see 3.4);
- b) body fittings, such as:
 - control device(s) with all accessories (see 4.2, 4.3 and 9.1);
 - hose assembly (see 4.4 and 9.4) and/or horns and/or nozzles;
 - head assembly with all accessories. This also constitutes the main closure (see 5.3);
 - operating device with all accessories (see 4.3).

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

- c) media (see 4.1.1). For powder extinguisher the media shall be according to EN 615 excluding powder for Class D extinguishers;
- d) propellant or propellant cartridge (see 4.5);
- e) mounting bracket (optional);
- f) marking and instructions.

4.2 Control of discharge

Extinguishers shall be fitted with a self-closing control valve to enable the discharge to be interrupted temporarily (see 9.5). A normally open control valve is not allowed.

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 is 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 discharge hose assembly shall have a flexible section of minimum overall length of 400 mm.

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 discharge hose assembly shall have a flexible section of 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 Internal pressure of stored pressure extinguishers

Stored pressure extinguishers, except carbon dioxide, shall have a means of continuously indicating the internal pressure visually. (see 7.1.3.2 and Clause 10).

4.7 Maximum mass

The mass of a fully charged extinguisher shall not exceed 20 kg.

4.8 Serviceability

It shall be possible to open the extinguisher in order to:

- externally and internally inspect the pressure retaining body;
- service and recharge the extinguisher.

5 Nominal charges, filling tolerances, design of filling opening

5.1 Nominal charges

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

5.2 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

5.3 Design of the filling opening, excluding carbon dioxide fire extinguishers

5.3.1 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.

5.3.2 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.

5.3.3 If the connection between the head and the cylinder is made with thread assembly, the minimum number of threads to be in full engagement when the extinguisher is fully operational is three.

6 Testing of extinguishers

6.1 General

Extinguishers for testing shall be stored for at least 24 h at a temperature of $(20 \pm 5) ^\circ\text{C}$ 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/shock procedure given in Annex K before the storage period, preceding the duration of operation test, the control valve test, and before the fire performance test.

All other extinguishers excluded CO₂ shall be subjected to the compaction/shock procedure according to Annex K only before the storage period preceding the duration of operation test.

NOTE If the compaction process is located in a place following the temperature requirement of the storage $(20 \pm 5) ^\circ\text{C}$, the compaction can be performed at any time during the control temperature storage time.

Class D extinguishers are not subject to the requirement of 6.2.

6.2 Minimum fire ratings

6.2.1 General

Fire classes are defined in EN 2.

The minimum fire ratings are specified in Tables 3 to 10, according to the type of extinguishing medium and the charge.

Fire performance shall be tested in accordance with Clause 14, and the extinguisher shall attain a Class A rating, a Class B rating, a Class F rating or any combination of these classes of fire, specified in the relevant table, in accordance with the rating claimed by the manufacturer.

Powder and carbon dioxide fire extinguishers should not be used on Class F fires as their use on this type of fire is considered hazardous. For this reason, powder and carbon dioxide fire extinguishers shall neither be tested for Class F capability according to this document nor marked with the “F” use code symbol.

6.2.2 Ratings for Class A fires

Permitted fire ratings of extinguishers for Class A fires are given in Tables 3, 4 and 5.

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 s	Nominal permitted charges kg
5A	6	1
8A	6	1, 2
13A	9	1, 2, 3, 4
21A	9	2, 3, 4, 6
27A	9	3, 4, 6, 9
34A	12	4, 6, 9
43A	15	6, 9, 12
55A	15	6, 9, 12

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

Fire rating	Minimum duration of operation s	Nominal permitted charges l
5A	6	1, 2, 3
8A	9	1, 2, 3, 6
13A	9	1, 2, 3, 6, 9
21A	9	2, 3, 6, 9

27A	12	3, 6, 9
34A	15	3, 6, 9
43A	15	6, 9
55A	15	6, 9

Table 5 —Fire ratings, minimum duration of operation and nominal charges for gaseous and clean agent extinguishing mediums extinguishers

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

6.2.3 Ratings for Class B fires

Permitted fire ratings of extinguishers for Class B fires are given in Tables 6, 7, 8 and 9.

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

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

Table 6 —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	2, 3, 4
89B	9	2, 3, 4
113B	12	2, 3, 4, 6
144B	15	3, 4, 6, 9
183B	15	4, 6, 9, 12
233B	15	4, 6, 9, 12

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

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

Table 8 — Fire ratings, minimum duration of operation and nominal charges for CO₂ extinguishers

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

Table 9 — Fire ratings, minimum duration of operation and nominal charges for gaseous and clean agent extinguishing mediums extinguishers

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

144B	15	3, 4, 6, 9, 12
183B	15	4, 6, 9, 12
233B	15	4, 6, 9, 12

6.2.4 Ratings for Class F fires

Permitted fire ratings of extinguishers for Class F fires are given in Table 10.

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

Table 10— Fire ratings, minimum duration of operation and nominal charges for F Class extinguishers

Fire rating	Minimum duration of operations s	Nominal permitted charges l
5F	6	1, 2
15F	6	1, 2
25F	9	1, 2, 3, 6
40F	12	2, 3, 6, 9
75F	15	2, 3, 6, 9

6.3 Duration of operation, residual charge

6.3.1 Duration of operation

6.3.1.1 Minimum duration

The duration of operation shall be greater than or equal to the appropriate value given in Tables 3 to 10 when the extinguisher is tested according to Annex A after being subjected to the compaction/shock procedure in accordance with Annex K (see Clause 6).

6.3.1.2 Spread of measurements

When three extinguishers are tested in accordance with Annex A, after being subjected to the compaction/shock procedure in accordance with Annex K (see Clause 6), the duration of operation of each extinguisher shall be within 15 % of the average value.

6.3.2 Residual charge

The residual charge (see 3.12) 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/shock procedure in accordance with Annex K (see Clause 6).

6.3.3 Commencement of discharge

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

6.4 Minimum range of operating temperature

6.3.1 $T_{\max}$ and $T_{\min}$ claimed by the manufacturer shall be used for the tests in 6.4.2, 6.4.3 and Annex B.

6.3.2 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 extinguishers without any additive $T_{\min}$ 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 CO₂ extinguishers, the duration of operation shall be not more than twice the value established at a temperature of 20 °C. CO₂ extinguishers shall conform to 6.4.3;
- the duration of operation shall be not less than 6s;
- 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.

6.3.3 The duration of operation of CO₂ 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.

7 Retention of propellant

7.1 Verification

7.1.1 General

All extinguishers and propellant cartridges shall be designed in such a way as to permit their retention of propellant to be checked at regular intervals.

7.1.2 Weighing

The following shall be capable of being checked by weight:

- propellant cartridges;
- CO₂ extinguishers;
- gaseous or clean agent extinguishers.

7.1.3 Pressure measuring methods

7.1.3.1 It shall be possible to check the retention of pressure of a stored pressure extinguisher, with the exception of carbon dioxide extinguishers, as specified in 7.1.3.1.1. or 7.1.3.1.2.