BS EN 16856:2020

BSI Standards Publication

Portable aerosol dispensers for fire extinguishing purposes

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National foreword

This British Standard is the UK implementation of EN 16856:2020.

The UK participation in its preparation was entrusted to Technical Committee FSH/2, Fire extinguishers.

A list of organizations represented on this committee can be obtained on request to its committee manager.

BSI, as a member of CEN, is obliged to publish EN 16856:2020 as a British Standard. However, attention is drawn to the fact that during the development of this European Standard, the UK committee voted against its approval.

It is the view of the UK committee that some requirements in EN 16856:2020 are not consistent with generally accepted practices in the UK relating to the performance assessment of portable fire extinguishing products, or with the approach taken in the UK regarding the colour coding used to identify such products.

Specifically, the UK committee is concerned that in order to comply with the requirements of this standard, products should be intended to extinguish test fires of at least two types of class rating, either type A + B, type A + F or type A + B + F classes of BS EN 2:1992 (see Clause 1). It is the opinion of the UK committee that this is not consistent with standards such as BS 6165:2019 and the BS EN 3 series, the requirements of which allow for products' minimum fire extinguishing performance to be assessed on test fires of a single type of class rating. With extinguishers tested against this standard required to be small and limited to a maximum total capacity of 1000 ml (see Subclause 5.2.1), it would also have been advantageous to manufacturers for this standard to have allowed for products' performance to be assessed on test fires of a single type of fire class rating, using specialized extinguishing media. By requiring that products extinguish test fires of at least two types of class rating, it is the opinion of the UK committee that this standard unnecessarily limits manufacturers in terms of both product performance and innovation.

Additionally, Clause 9 specifies that the colour coding used on products being assessed against the requirements of this standard should identify the classes of fire on which the extinguisher can be used, and be one of three:

- Silver Grey (type A + B);
- Signal Yellow (type A + F); or
- Oyster White (type A + B + F).

Common practice in the UK is to recognize the colour coding of fire extinguishers in accordance with BS 5306-10:2019, whereby all extinguishers are recommended to be colour coded to designate the specific extinguishing medium contained therein (the colours of which do not match those listed above). The UK committee advises users to note the difference between the requirements of this standard (where colour coding should identify classes of fire) and the recommendations in BS 5306-10:2019 (where colour coding is recommended to designate extinguishing media), to avoid any potential confusion.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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EN 16856

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English Version

Portable aerosol dispensers for fire extinguishing purposes

Générateur d'aérosol portatif à fonction extinctrice

Feuerlöschsprays

This European Standard was approved by CEN on 27 January 2020.

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European foreword

This document (EN 16856:2020) has been prepared by Technical Committee CEN/TC 70 "Manual means of firefighting equipment", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2020, and conflicting national standards shall be withdrawn at the latest by October 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document has been written with the aim of producing a specification for small disposable, aerosol dispensers for fire extinguishing purposes with an acceptable level of performance. This type of product is intended for domestic use only in situations where fires of limited proportions are anticipated because of the nature of some process or activity, where the possibility of fire spreading to other materials is remote, or where people are present at the likely times of risk. These products are not intended to supplant extinguishers that comply with EN 3.

Special attention is drawn to Directive 75/324/EEC of 20 May 1975, on the approximation of the laws of the member states relating to Aerosol Dispensers, Directive 2008/47/EC and Commission Directive 94/1/EC of 6 January 1994 adapting some technicalities of Council Directive 75/324/EEC on the approximation of the laws of the Member States relating to aerosol dispensers.

1 Scope

This document specifies the requirements for non-refillable portable aerosol dispensers for fire extinguishing purposes.

It supplements the characteristics, performance and test methods for extinguishing aerosol dispensers for fire extinguishing purposes, in addition to the requirements of the Directive 75/324/EEC. Requirements in this document are specified for products containing less than 1 kg or 1 l of extinguishing media, which can be expelled by the action of internal pressure and are intended to extinguish test fires of type A + B, or type A + F, or type A + B + F classes of EN 2. These extinguishing aerosol dispensers are intended to be used by untrained persons for domestic applications. They are not intended to be used on gas fires (class C) and metal fires (class D).

Requirements are specified for minimum performance in Annex I for extinguishing test fires of type A, type B and type F classes of EN 2, as appropriate.

Annex A gives the conditioning to be applied to extinguishing aerosol dispensers prior to testing as described in Annex B to Annex K.

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.

EN 2, *Classification of fires*

EN 3 (all parts), *Portable Fire Extinguishers*

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

EN 1568-3, *Fire extinguishing media - Foam concentrates - Part 3: Specification for low expansion foam concentrates for surface application to water-immiscible liquids*

EN 1568-4, *Fire extinguishing media - Foam concentrates - Part 4: Specification for low expansion foam concentrates for surface application to water-miscible liquids*

EN 14848, *Aerosol containers - Metal containers with 25,4 mm aperture - Dimensions of valve cups*

EN 14850, *Aerosol containers - Metal containers with 25,4 mm aperture - Measurement of contact height*

EN 15006, *Metal aerosol containers - Aluminium containers - Dimensions of the 25,4 mm aperture*

EN 15008, *Aerosol containers - Aluminium containers - Dimensions of one-piece cans with 25,4 mm aperture*

EN ISO 9227, *Corrosion tests in artificial atmospheres - Salt spray tests (ISO 9227:2017)*

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*

3 Terms and definitions

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

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

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

3.1
fire extinguishing aerosol dispenser
non-refillable metallic container intended for a single use, which holds a compressed gas and liquid, paste or powder extinguishing media, equipped with a valve allowing a controlled discharge of the contents

3.2
batch
definite quantity of products or components produced at one time under uniform condition

3.3
body
metallic container of the extinguishing aerosol dispenser not fitted with its accessories, such as valves

3.4
valve
self-closing release device allowing the discharge of the extinguishing media to be interruptible

3.5
charge of an extinguishing aerosol dispenser
mass or volume of the extinguishing media contained in the extinguishing aerosol dispenser

3.6
maximum pressure at maximum operating temperature
$P(T_{max})$
pressure within the extinguishing aerosol dispenser when filled with the quantity of solid, liquid and gaseous content to the maximum upper tolerance specified under production conditions, at a temperature of T_{max}

3.7
working pressure
pressure declared by the manufacturer as the pressure within the extinguishing aerosol dispenser, when filled with quantities of solid, liquid and gaseous content at 20 °C

3.8
extinguishing media
substance including any additive, such as corrosion inhibitor, freezing point depressant or foaming agent, contained in the extinguishing aerosol dispenser that causes extinction of a fire

3.9
protective cap
cover over the valve of the extinguishing aerosol dispenser

Note 1 to entry: if fitted, the protective cap may be the safety device.

3.10
propellant
compressed gas held in the container, which provides the required pressure for the discharge of the extinguishing media

3.11
fire rating
designation of the largest test fire that has been extinguished when tested in accordance with 7.5.2, 7.5.3 and 7.5.4

3.12
domestic
premises occupied as a private dwelling, including any garden, yard, garage, outhouse, or appurtenance of such premises, which is not used in common by the occupants of more than one such dwelling

3.13
safety device
part that needs to be broken or removed before the extinguishing aerosol dispenser, and can be activated to prevent inadvertent operation

3.14
security seal
part that is broken when removing the safety device and once broken cannot be replaced

3.15
minimum operating temperature
T_{min}
minimum temperature declared by the manufacturer at which the extinguishing aerosol dispenser will operate

3.16
maximum operating temperature
T_{max}
maximum temperature declared by the manufacturer

4 Contents of the extinguishing aerosol dispenser

4.1 Extinguishing media

The extinguishing media shall be one of the following:

— water based, including additives conforming to the physical and chemical characteristics declared by the manufacturer;

— powder conforming to EN 615.

For products containing AFFF, use EN 1568-3 or EN 1568-4; and for those containing powder use EN 615.

Where an EN or ISO standard applies, it should be used.

4.2 Propellant

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 a water-based extinguishing aerosol dispenser. Tracers may be added to the propellant to facilitate leakage detection, but the content shall not exceed a mass fraction of 10 % of the propellant content.

Table 1 — Permitted propellants

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

5 Construction, design and prototype testing

5.1 Operation

5.1.1 The extinguishing aerosol dispenser shall be operated by activating the valve. The method of activation shall be readily apparent. It shall be possible to operate the valve by one single action after having removed the safety device. It shall not be necessary for any movement of the actuating mechanism to be repeated in order to initiate discharge.

5.1.2 The construction of the extinguishing aerosol dispenser shall ensure no parts can be removed, excluding items in 5.1.6 and 5.1.7.

5.1.3 The design of the extinguishing aerosol dispenser shall allow visual identification if the extinguishing aerosol dispenser has been unsealed.

5.1.4 If during visual inspection the seal is found to be broken the extinguishing aerosol dispenser shall be discarded.

5.1.5 The extinguishing aerosol dispenser shall be used with the valve upright.

5.1.6 The extinguishing aerosol dispenser shall incorporate a safety device to prevent inadvertent operation, which shall be so constructed that any unaided manual attempt to initiate discharge will not deform or break any part in a way that would prevent the subsequent discharge of the extinguishing aerosol dispenser.

5.1.7 The extinguishing aerosol dispenser shall have a security seal, which shall be broken by the removal of the safety device. The force required to remove the safety device and break the security seal shall be between 5 N and 50 N, see Annex F. This security seal shall not be re-usable.

5.1.8 The extinguishing aerosol dispenser shall incorporate a valve to enable the discharge to be started. The force required to actuate the device shall be between 5 N and 50 N. This valve shall be self-closing enabling the discharge to be interrupted, see Annex F.

5.2 Body and closure

5.2.1 Body

The body shall be a metallic seamless container and shall have a maximum total capacity of 1000 ml, and if in aluminium shall be in accordance with EN 15006 and EN 15008.

Seamless steel containers are allowed.

5.2.2 Closure

The closure shall be crimped under the neck ring of the body, in accordance with EN 14848 and EN 14850.

5.3 Corrosion resistance

5.3.1 External corrosion

After testing in accordance with B.1, the extinguishing aerosol dispenser shall show no signs of corrosion or other chemical degradation likely to impair its operation or safety, and shall fulfill the following requirements:

— the force required to release the safety device shall be as specified in 5.1.7;

— the force required to actuate the extinguishing aerosol dispenser shall be as specified in 5.1.8;

— when the extinguishing aerosol dispenser is tested in accordance with G.1 each duration of operation at (20 ± 10) °C shall be within ± 25 % with a maximum deviation of 5 s of the average value determined in 7.2;

— the extinguishing aerosol dispenser shall fulfil requirement of 5.7;

— the rate of pressure loss shall not exceed 5 % of the working pressure per annum.

5.3.2 Internal corrosion

After testing in accordance with B.2, the extinguishing aerosol dispenser shall fulfill the following requirements:

— the rate of pressure loss shall not exceed 5 % of the working pressure per annum;

— when the extinguishing aerosol dispenser is tested in accordance with G.1 each duration of operation at (20 ± 10) °C shall be within ± 25 % with a maximum deviation of 5 s of the average value determined in 7.2;

— the extinguishing aerosol dispenser shall fulfill the requirements of 5.7.

5.3.3 Chemical and pressure stability

The contents shall not generate pressure by reacting with the body or any lining. The complete assembly shall be chemically stable. Small increases are permitted, but the total pressure may increase by a maximum of 10 % of the working pressure during the test, but shall be stable by the end of the test. It shall be tested in accordance with Annex K.

5.4 Impact resistance

After being subjected to testing in accordance with Annex C, the extinguishing aerosol dispenser (with safety device) correctly charged and equipped with all the fittings that are subject to internal pressure in normal operation, may leak but the body shall not rupture. To ensure any leak does not affect the performance of the extinguishing aerosol dispenser, it shall operate as intended and be tested after 5 min of being subjected to the tests in Annex C. The discharge time shall be ± 25 % with a maximum deviation of 5 s of the actual time measured in 7.2 and the minimum discharge shall be in accordance with 7.3.

5.5 Resistance to shock and mechanical damage

After being subjected to testing in accordance with Annex D, the extinguishing aerosol dispenser (with safety device) shall operate as intended i.e. the discharge time shall be ± 25 % with a maximum deviation of 5 s of the average effective discharge time measured in 7.2 and the minimum discharge shall be in accordance with 7.3.

5.6 Test pressure

The body shall withstand an internal pressure of 10 bar or 1,5 times the $P(T_{max})$, whichever is the greater, without permanent deformation and no increase in volume greater than 1 % when tested in accordance with E.2.

5.7 Burst pressure

The minimum burst pressure of the assembly, fitted with all pressure retaining parts, shall be 18 bar or at least 1,2 times test pressure, whichever is the greater, when tested in accordance with E.3.

The assembly shall not fragment or eject any parts.

5.8 Life of product

The extinguishing aerosol dispenser has a maximum expiry date of 39 months from the date of manufacture.

Extinguishing aerosol dispensers are intended to be discarded after any use and are not to be refilled.

NOTE Disposal might be controlled by National laws and regulations.

5.9 Dielectric test

5.9.1 General

The dielectric test is designed to determine the electrical conductivity of the water based extinguishing aerosol dispenser discharge stream during the test when performed in accordance with Annex J.

5.9.2 Required performance

When the extinguishing aerosol dispenser is in operation and the metallic plate is live, the current between the aerosol dispenser and earth, and between the nozzle and earth, shall not be more than 0,5 mA at any time during the complete discharge of the extinguishing aerosol dispenser. The test shall be carried out in accordance with Annex J.

6 Filling requirements

6.1 Media tolerance

The filling tolerance of the contents shall be ± 3 % for all extinguishing media.

The filling tolerance for each individual constituent excluding water of the content shall be −0/ + 10 % on the declared composition of the media.

6.2 Filling pressure

The filling pressure shall be ± 0,5 bar of the working pressure as declared by the manufacturer, at 20 °C.

6.3 Maximum developed pressure

The lowest allowed T_{max} is 50 °C

The filling pressure, when filled to the upper tolerance, shall be such that the maximum developed pressure at 50 °C shall not exceed 15 bar.

Where T_{max} is declared greater than 50 °C, all the requirements of the ADD required at 50 °C shall be performed at the declared T_{max}.

7 Performance

7.1 Delay on operation

Not more than 2 s shall elapse between actuation of the valve and commencement of the discharge when tested in accordance with G.1.

7.2 Duration of discharge

The duration of effective discharge for each aerosol dispenser shall be not less than 6 s when tested in accordance with G.1 (continuous discharge). The time should be recorded for each dispenser and the average noted. The deviation shall be within 20 % with a maximum of 5 s.

7.3 Minimum discharge of contents

The extinguishing aerosol dispenser, when operated in its normal working position, shall discharge not less than 85 % of the nominal charge, when tested in accordance with G.1 (continuous discharge) and G.2 (intermittent discharge).

7.4 Retention of charge following partial discharge

The second pressure shall not be less than 80 % of the first, when the extinguishing aerosol dispenser is tested in accordance with Annex H.

7.5 Fire extinguishing performance rating — Ratings

7.5.1 General

The extinguishing aerosol dispenser shall fulfil the requirements of 7.5.2 and 7.5.3 or 7.5.2 and 7.5.4 or 7.5.2, 7.5.3 and 7.5.4.

7.5.2 Class A rating

The class A rating of the extinguishing aerosol dispenser shall be 5A or 8A when tested in accordance with the test method described in I.3.

7.5.3 Class B rating

The class B rating of the extinguishing aerosol dispenser shall be 21B or 34B when tested in accordance with the test method described in I.4.

7.5.4 Class F rating

The class F rating of the extinguishing aerosol dispenser shall be 5F or 15F when tested in accordance with the test method described in I.5.

7.6 Effective throw

At least 75 % of the extinguishing agent shall reach a throwing distance of at least 2 m when the extinguishing aerosol dispenser is placed vertically at a height of 1,5 m when tested in accordance with G.3.

8 Production tests

8.1 General

In addition to any other scheme of quality control, extinguishing aerosol dispensers shall be tested according to the production testing schemes of this sub clause.

8.2 Verification of strength

8.2.1 General

The integrity of each extinguishing aerosol dispenser shall be verified by one of the following methods.

Directive 75/324/EEC specifies that if 8.2.3 or 8.2.4 are used the test method shall be approved by a competent authority.

NOTE Further information in bibliography [4] and [5].

8.2.2 Hot water bath method

Each extinguishing aerosol dispenser shall be fully immersed in water, which is maintained at 50 °C. The extinguishing aerosol dispenser shall remain in the water bath long enough to allow the contents to also reach 50 °C and therefore develop $P(T_{max})$. The extinguishing aerosol dispenser shall then be observed for a period of 15s, any extinguishing aerosol dispenser that deforms or show any sign of leakage with bubbles shall be rejected (this does not satisfy the requirement of 8.6).

For each production cycle it shall be demonstrated that $P(T_{max})$ is actually reached in a representative test sample.

8.2.3 Hot final test method

Each extinguishing aerosol dispenser shall be warmed in such a way as to ensure that the contents are at 50 °C and therefore develops the internal pressure $P(T_{max})$. This pressure shall be maintained for a minimum of 15 s, any extinguishing aerosol dispensers that deform shall be rejected.

Leaks shall be detected with the same precision as in the case of the hot water bath test.

8.2.4 Cold final test method

Prior to assembly, each body shall be subjected to test pressure in accordance with E.2. No permanent deformation shall be detected.

8.3 Burst test

From every batch, bodies shall be selected at random in accordance with the sampling plan in Table 2 and shall be subjected to a burst pressure test in accordance with E.3.

The pressure at which each of the bodies bursts shall be greater than that calculated in 5.7.

Table 2 — Burst test sampling plan

Number of assemblies per batch *N*	Number of assemblies sampled
$N \leq 2\,500$	5
Each additional 2 500	5

If a body bursts at a pressure less than that calculated in 5.7, then the test shall be repeated with another number of samples, randomly selected from the same batch in accordance with Table 2. If a body from the second series of tests bursts below the pressure calculated in 5.7, then the whole batch shall be rejected.

8.4 Crimped closures

8.4.1 During production, the first extinguishing aerosol dispenser produced from each batch of valves or bodies and the first extinguishing aerosol dispenser produced from each crimping head each day, shall be checked for conformity to 5.2.2 and the results recorded.

If this sample does not conform, a further sample, produced after any appropriate adjustments, shall be checked.

Production shall not commence until a sample conforming to 5.2.2 has been tested.

8.4.2 If more than 2500 extinguishing aerosol dispensers are produced in a day, from a crimping head, one extinguishing aerosol dispenser in every 2500 subsequently produced shall be tested; if one fails to conform to 5.2.2 then checks to identify all faulty extinguishing aerosol dispensers shall be made. All that do not conform to 5.2.2 shall be rejected and the procedure specified in 8.4.1 shall be repeated.

A record of the measured dimensions shall be kept.

8.5 Discharge test

One extinguishing aerosol dispenser in every 2500 shall be fully discharged in the normal working position with the valve fully opened. The discharge duration and percentage discharge shall be recorded. If these extinguishing aerosol dispensers do not meet the requirements of 7.2 and 7.3, then 10 more extinguishing aerosol dispensers shall be tested, if any fail, the batch shall be rejected.

8.6 Leak test

Each extinguishing aerosol dispenser shall be submitted to a final inspection of the filled and pressurized extinguishing aerosol dispenser, capable of detecting a leakage rate equivalent to a loss of pressure of 5 % per annum. Products with a leakage rate greater than 5 % per annum shall be rejected.

NOTE Leak detection by means of tracer gas detection is a suitable test method.

9 Colour and marking of extinguishing aerosol dispensers

9.1 Colour

The extinguishing aerosol dispensers shall be coloured as follows:

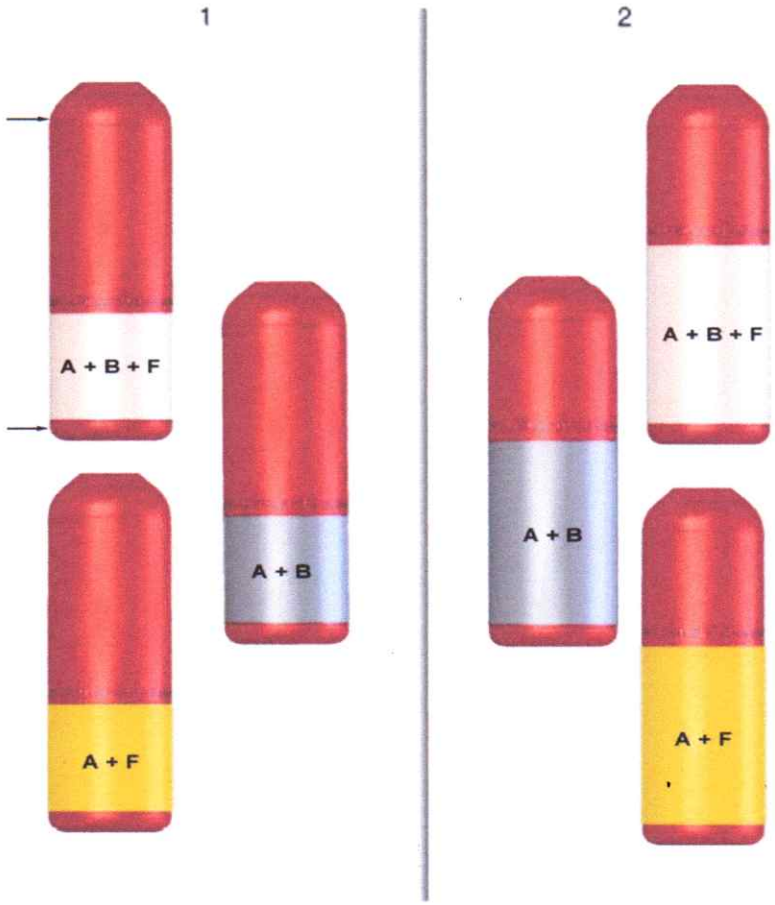
— between 50 % and 70 % of the surface area of the extinguishing aerosol dispensing body shall be red in the range RAL 3000 to RAL 3002 as specified in Farbregister RAL –841-GL;

— the remainder of the surface area, which will be an area of between 50 % and 30 % of the extinguishing aerosol body shall be of colour to identify the classes of fires on which the aerosol dispenser can be used.

The zone of colour shall be a single horizontal zone located anywhere between the two arrows shown in accordance with Figure 1.

All text and symbols shall be printed in a colour contrasting to the colour of the background on which it is printed. A light reflectance value (LRV) difference of 70 % or more is required (see bibliography [6]).

The marking shall remain clear and legible throughout the expected life of the extinguishing aerosol dispenser.



Key

1 Red area 70 %
2 Red area 50 %

Figure 1 — Cylinder red area and colour

9.2 Marking - Primary information

9.2.1 The extinguishing aerosol dispenser shall be marked with the following:

a) the words "Fire extinguishing spray" in letters of height not less than 4 mm;

b) for A + B, the words "Suitable for small fires, except gas and cooking oil fires" (colour zone RAL 7001 – Silver Grey) in letters of height not less than 4 mm,

for A + F the words "Suitable for small fires, except gas and liquid fuel fires" (colour zone RAL – 1003 Signal Yellow) in letters of height not less than 4 mm,

for A + B + F, the words "Suitable for small fires, except gas fires" (colour zone RAL 1013 – Oyster White) in letters of height not less than 4 mm;

c) for water based extinguishing aerosol dispensers the words, in letters of height not less than 4 mm:

WARNING - Do not use on live electrical equipment

This warning applies despite the requirement of 5.9.

d) for all extinguishing aerosol dispensers the words, in letters of height not less than 1,5 mm:

WARNING –Keep *x* metre distance from the fire

Where *x* is declared by the manufacturer and may not be less than 1 m;

e) the method of operation in symbols (optional) of minimum size 20 mm and words with letters of height not less than 1,5 mm;

f) graphical symbols indicating the fire class, see EN 3-7, minimum size 15 mm, shall be located in the colour coded area;

g) an instruction to discard the extinguishing aerosol dispenser if the security seal is broken or missing, or after any use (including partial use) or after the expiry date marked on the extinguishing aerosol dispenser, in letters of height not less than 1,5 mm;

h) do not dispose of with general household waste. Please recycle this product in accordance with local requirements, in letters of height not less than 1,5 mm.

The height of the lettering of the text when specified shall be determined by reference to an upper case letter E.

The text of the instructions for use shall be in the language or languages (limited to a maximum of three) of the country where the extinguishing aerosol dispenser is intended to be used.

9.2.2 All instructions concerning safety, i.e. items a), b), c) and d) of 9.2.1 shall be in a prominent position and in lettering that stands out by reason either of its size or its colour.

9.3 Marking - Secondary information

9.3.1 The extinguishing aerosol dispenser shall be marked with the following:

a) the name and address and trademark (if a trademark exists) of the legally responsible entity for placing the extinguishing aerosol dispenser in the market;

b) the filling date and the expiry date (month and year) and the batch number; the expiry date shall be 39 months after the filling date, see 5.8;

c) the words: "Conforms to EN 16856";

d) the class of fire and fire rating achieved;

e) the nominal mass, type of extinguishing media and the total volume of the body;

f) operating temperature range, top and bottom limits;

g) the instruction: "Keep out of reach of children";

h) the instruction: "Not to be refilled";

i) the instruction: "Pressurized container; protect from sunlight and other sources of heat and do not expose to temperatures exceeding 50 °C. Do not pierce or burn, even after use";

j) the "3" (inverted epsilon) indicating compliance with the current EU aerosol dispensers directive;

k) the warning: "If damaged this product must be discarded";

l) any additional operating instructions that alerts the consumer to the specific dangers of the product.

The letter height shall not be less than 1,2 mm and the markings specified in g), h), i), j), k), and l) shall have a letter height greater than that used for the markings specified in a), b), c), d), e) and f).

9.3.2 The markings specified in 9.3.1 shall be marked on a part of the extinguishing aerosol dispenser separate from that bearing the markings specified in 9.2.1.

Marking of EN 16856 on or in relationship to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is solely the claimant's responsibility.

10 Sampling

Annex L provides an example of samples required for completion of testing.

Annex A
(normative)
Test conditions

A.1 Storing and temperature

Unless otherwise stated, store extinguishing aerosol dispensers for not less than 24 h at a temperature of (22 ± 8) °C before tests are carried out and maintain them within this temperature range until tested. Unless stated otherwise, the ambient temperature for carrying out the tests is 0 °C to 30 °C.

For the discharge performance tests of Annex F, Annex G and Annex H and the fire performance tests of Annex I use extinguishing aerosol dispensers fitted with a protective cap or safety device.

A.2 Mechanical preparation

Hold the extinguishing aerosol dispenser in the vertical position and drop it vertically 500 times from a height of (15 ± 1) mm at a frequency of (1 ± 0,02) Hz onto a rigid steel plate, of dimensions (300 ± 5) mm square and (60 ± 1) mm thick. Store the extinguishing aerosol dispenser at a temperature (22 ± 8) °C for not less than 24 h.

A.3 Pressure connection

A.3.1 Permanent connection

The extinguishing aerosol dispenser shall be submitted for testing fitted with a suitable permanent pressure connection to the body to allow the internal pressure to be measured.

NOTE The extinguishing aerosol fitted with the permanent suitable connection will be provided by the manufacturer.

A.3.2 External measuring device

The extinguishing aerosol dispenser shall be submitted for testing with a suitable connecting device to allow the internal pressure to be measured.

NOTE The suitable device will be provided by the manufacturer.

Annex B
(normative)
Corrosion test

NOTE See 5.3.1, 5.3.2, 5.7, and 7.2.

B.1 External corrosion

Six complete extinguishing aerosol dispensers shall be subjected to a salt spray test in accordance with EN ISO 9227 type NSS for a period of 240 h and then shall be washed to remove any salt deposits.

B.2 Internal corrosion

Prepare ten extinguishing aerosol dispensers as described in A.1, A.2 and A.3.2, and examine for leakage.

Divide the extinguishing aerosol dispensers into two groups of five.

Each group shall be subjected to the temperature cycling sequence given in Table B.1 eight times.

Table B.1 — Storage conditions for extinguishing aerosol dispenser tests

Duration h	**Storage temperature for extinguishing aerosol dispensers** Group 1 store upright, Group 2 store horizontal °C
24 ± 1	T_{min} ± 2
24 ± 1	+ 20 ± 5
24 ± 1	T_{max} ± 2
24 ± 1	+ 20 ± 5

After completion of the storage cycles in Table B.1, subject six of the extinguishing aerosol dispensers to tests described in 5.3.2.

Annex C
(normative)
Impact test

NOTE See 5.4, 7.2 and 7.3.

WARNING - Precautions shall be taken to protect personnel from the effects of any pressure and extinguishing media release.

Condition two extinguishing aerosol dispensers, prepare as described in A.1 and A.2 for 24(+2/-0) h, at a temperature of (T_{min} ± 2) °C for water based aerosol dispensers or (−20 ± 2)°C for powder based aerosol dispensers.

Maintain at the temperature until the test.

Mount a steel cylindrical hammer of diameter (75 ± 2) mm, mass $4^{+0,025}_{0}$ kg, with flat faces, in loose guides so that it will drop vertically and freely through a height H, where H is (50 ± 5) mm.

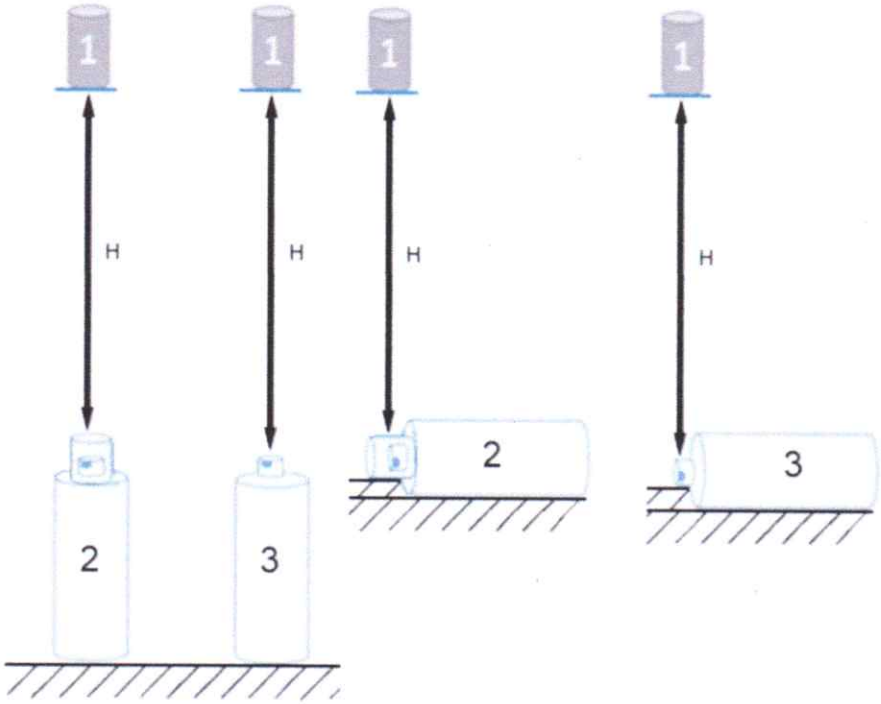
The height H is the distance measured from the lowest point on the hammer to the first point of contact with the extinguishing aerosol extinguisher.

Remove the extinguishing aerosol dispenser from the low temperature environment and place the extinguishing aerosol dispenser on a rigid flat surface in each of the following two positions consecutively:

a) in the normal upright position, with the longitudinal axis of the hammer coincident with the longitudinal axis of the valve;

b) lying on its side and resting on a rigidly fixed steel block with the longitudinal axis of the hammer intersecting the longitudinal axis of the valve at right angles.

In each of the above and within 1 min of removal from the low temperature environment, subject the valve of the extinguishing aerosol dispenser to an impact by allowing the steel hammer to fall vertically onto it from the height H, see Figure C.1.



Key

1 Steel cylindrical hammer

2 Extinguishing aerosol dispenser with cap

3 Extinguishing aerosol dispenser without cap

H 50 ± 5 mm

Figure C.1 — Impact resistance

Annex D
(normative)
Mechanical drop test

NOTE See 5.5, 7.2 and 7.3.

Prepare three extinguishing aerosol dispensers as described in A.1 and A.2.

Drop each extinguishing aerosol dispenser, correctly filled and pressurized and completed with its normal fittings, the distance being measure from the lowest part of the dispenser to the surface of the flat concrete.

Drop the first aerosol with the body axis horizontal and with no protrusion downward from a height of $2_{0}^{+0,15}$ m.

Drop the second with the body axis vertical and the head up from a height of $2_{0}^{+0,15}$ m.

Drop the third with the body axis vertical and the head down from a height of $1,0_{0}^{+0,15}$ m.

Annex E
(normative)
Pressure tests for bodies

E.1 General

Prepare the extinguishing aerosol dispensers as described in A.1 and A.2.

E.2 Test for resistance to pressure

NOTE See 5.6 and 8.2.4.

Pressurize the body hydraulically, raising the pressure to the appropriate test pressure defined in 5.6 with a tolerance of (−0/+0,5) bar, at an approximately constant rate over a period of 0,5 min to 3 min, disregarding any temporary changes in rate due to the effective deformation and retain that pressure for 3^{+5}_{0} s, before allowing the pressure to fall to zero. Visually check the body for permanent distortion or leakage, disregarding any temporary deformation under pressure.

E.3 Minimum burst test

NOTE See 5.7 and 8.3.

Pressurize the body hydraulically, raising the pressure to the appropriate test pressure defined in 5.6 with a tolerance of (−0/+0,5)bar, at an approximately constant rate over a period of 0,5 min to 3 min, disregarding any temporary changes in deformation and retain that pressure for 30^{+5}_{0} s. Then increase the pressure, with the same settings as above, until the body bursts.Record the burst pressure and mode of failure.

Annex F
(normative)
Measurement of forces

NOTE See 5.1.6 and 5.1.7.

Prepare the extinguishing aerosol dispensers as described in A.1 and A.2.

To remove safety device or protective cap and actuate the portable aerosol device, the forces shall be measured using a dynamometer and shall be applied in line without movement to the normal point of application of the forces and in the normal direction of use.

Annex G
(normative)
Discharge tests

G.1 Duration of discharge and minimum discharge of contents

NOTE See 7.1, 7.2 and 7.3.

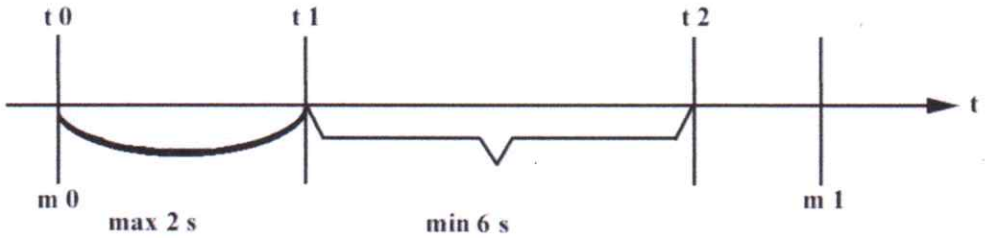
Prepare six extinguishing aerosol dispensers as described in A.1 and A.2.Remove any protective cap or safety device.

Weigh the extinguishing aerosol dispenser. Fully discharge the extinguishing aerosol dispenser in its normal working position with the valve fully opened, recording the times at the following:

a) commencement of discharge;

b) the end of the effective discharge, i.e. when propellant gas suddenly appears or its proportion suddenly increases, as indicated by a marked change in the character of the discharge.

Continuously discharge the extinguishing aerosol dispenser to exhaustion. Weigh the extinguishing aerosol dispenser. Record the times t_1 and t_2 and calculate the effective discharge time. Record the weights m_0 and m_1 and calculate the proportion of the contents discharged, see Figure G.1.



Key

t	time
t_0	opening of valve (start chronometer)
t_1	start of emission of extinguishing media (intermediate time on chronometer)
t_2	end of actual emission, i.e. significant change in flow rate (stop chronometer)
m_0	weight of extinguishing aerosol dispenser before commencing discharge
m_1	weight of the extinguishing aerosol dispenser at the end of the complete discharge
t_1-t_0	discharge actuation time
t_2-t_1	effective discharge time
	Minimum discharge of the contents $m_0 - m_1 \geq 85$ % of the net contents by weight

Figure G.1 — Discharge diagram

G.2 Intermittent discharge and minimum discharge of contents

NOTE See 7.3.

Prepare three extinguishing aerosol dispensers as described in A.1 and A.2.

Remove any protective cap or safety device. Weigh the extinguishing aerosol dispenser. Discharge the extinguishing aerosol dispenser in its normal working position, recording any delay in operation as in Figure G.1. Three seconds after the commencement of discharge close the valve for 10 s, then open the valve for 3 s and repeat the cycle to the end of effective discharge, see t_2, Figure G.1. Discharge the extinguishing aerosol dispenser to exhaustion and weigh again. Calculate the proportion of the contents discharged.

G.3 Effective throw

NOTE See 7.6.

Prepare the extinguishing aerosol dispenser as described in A.1 and A.2.

Extinguishing aerosol dispensers used for tests in Annex F may be used for these tests.

Remove any protective cap or safety device.

Mount the extinguishing aerosol dispenser vertically on a support at a height of 1,5 m ± 0,05 m when measured from the discharge nozzle to the floor. Discharge the entire extinguishing aerosol dispenser. Collect and weigh all extinguishing media that falls to the floor and does not reach a distance of 2 m ± 0,05 m when measured horizontally from the discharge nozzle.

Annex H
(normative)
Test for retention of charge after partial discharge

NOTE See 7.4.

Prepare three extinguishing aerosol dispensers as described in A.1, A.2 and A.3.1.

Remove any protective cap or safety device.

Discharge the extinguishing aerosol dispenser for a period of between 40 % and 60 % of the average effective discharge time measured in 7.2, see G.1 and close the valve. Measure the internal pressure. After 300_{0}^{+5} s measure the internal pressure again.

Express the second pressure as a percentage of the first.

Annex I
(normative)
Fire extinguishing performance tests

I.1 General

NOTE See 7.5.

WARNING - Attention is drawn to the necessity for taking precautions to safeguard the health of personnel conducting the tests again the risk of fire and inhalation of smoke and any toxic products of combustion.

WARNING - Respiratory protection may be worn to protect the operator from effects of the repeated testing over a period of time. Such protection is not intended to permit an otherwise intolerable exposure to any fumes and or smoke from a single fire.

WARNING - Suitable working clothes should not be liable to ignite or melt during the firefighting process.

Prepare the extinguishing aerosol dispenser as described in A.1 and A.2. To carry out these tests the operator shall be dressed in clothing suitable for the purpose. The use of a helmet, gloves and approved non-reflective visor is permitted. The operator shall not wear an aluminium faced suit.

I.2 Schedule for testing

The basic schedule of testing to determine the test fire rating comprises a set of three test fires for each class and a rating is achieved by extinguishing at least two of the three.

There is no restriction on the number of sets that may be carried out, but a set comprises fires for each class consecutively carried out and the result of any particular test fire is not to be disregarded. Each set shall be completed before another is started.

Each set is completed either when all three test fires for each class are carried out or when the first two test fires for each class are either both successful or both unsuccessful. Use the extinguishing aerosol dispenser according to the manufacturer's operating instructions.

I.3 Class A fire test

I.3.1 Characteristics of test fire

Class A test fires shall consist of a crib of wooden sticks supported on a metal frame 250 mm high, 900 mm wide and of a length equal to that of the test fire (see Figure I.2). The metal frame shall be constructed from angle sections (L × W) 50 mm × 50 mm as specified in ISO 657-1.

Each test fire is designated by a number (which indicates the fire size) followed by the letter A. The designating number of the test fire represents the following two parameters as shown in Table I.1:

a) the length of the test fire in decimetres, i.e. the length of the wooden sticks arranged in the longitudinal direction of the test fire;

b) the number of 500 mm wooden sticks for each layer arranged in the transverse direction of the test fire.

Table I.1 — Construction of class A test fires

Designation of test fire	Number of 500 mm wooden sticks in each transverse layer	Length of test fire m
5A	5	0,5
8A	8	0,8

The wooden sticks shall be of *Pinus Silvestris* containing 10 % to 15 % of moisture by mass when determined in accordance with ISO 4470. The measurements shall be made on at least five samples each (500 ± 10) mm long. They shall be sawn and of square section of side (39 ± 2) mm. The density of the wood shall be 0,40 kg/dm³ to 0,65 kg/dm³.

The wooden sticks shall be stacked in 14 layers on the metal frame, as shown in Figures I.1 and I.2.

Dimensions in millimetres

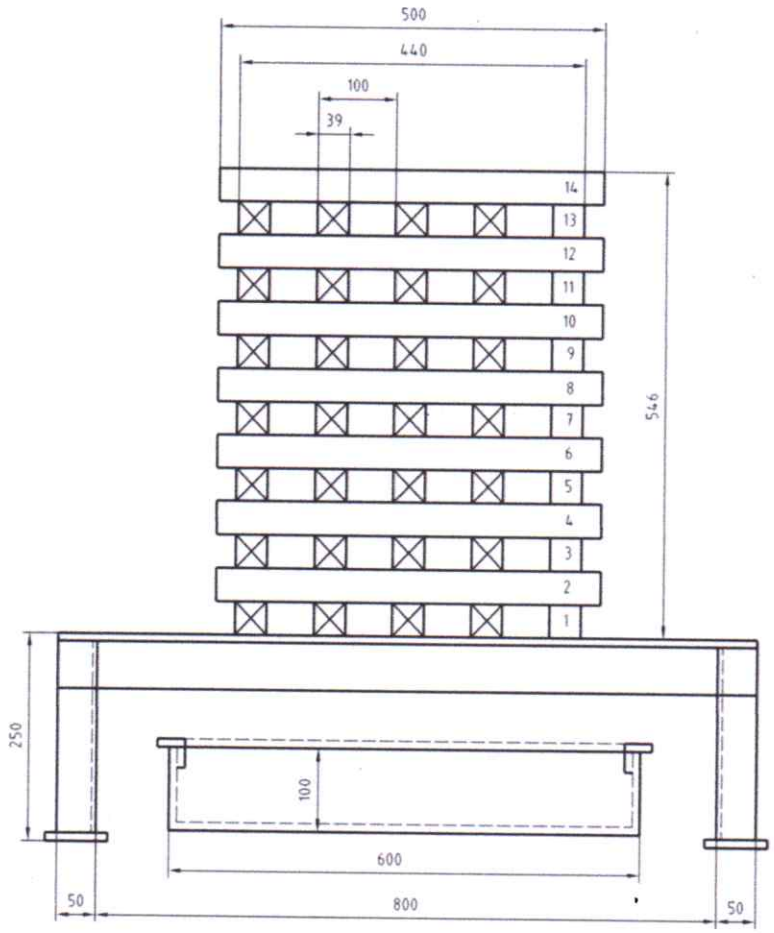


Figure I.1 — Class A fire - Front view (identical for all fires)

Dimensions in millimetres

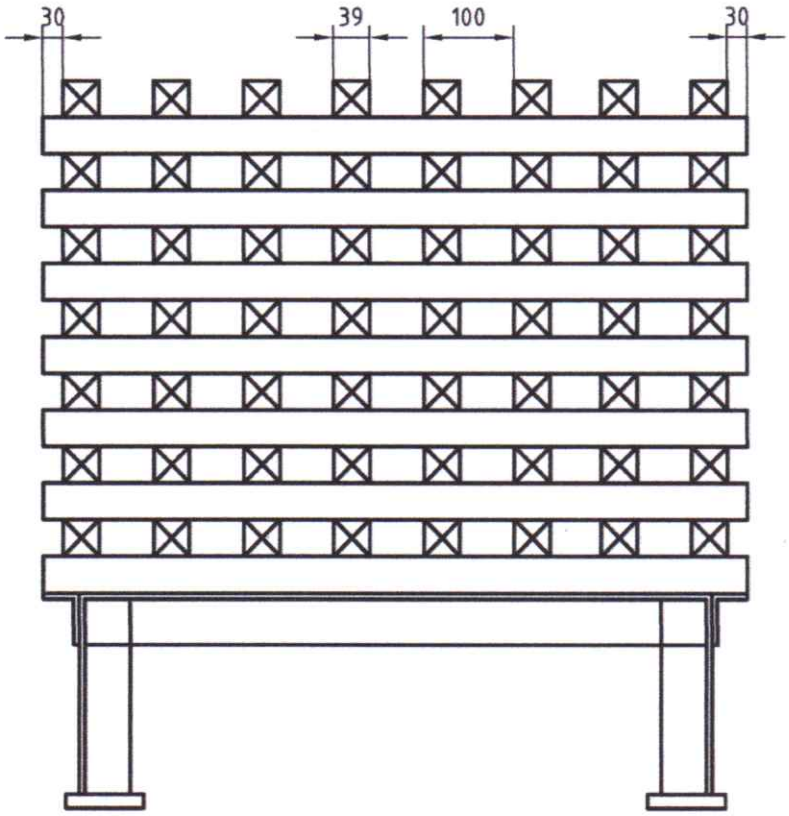


Figure I.2 — Example of class A fire (8A fire) - Sideview (variable according to size of fire)

The sticks in each layer shall be spaced at regular intervals with gaps of 6 cm between the sticks.

The sticks laid transversely (layers 2, 4, 6, 8, 10, 12 and 14) shall have a fixed length of (500 ± 10) mm.

The sticks laid longitudinally (layers 1, 3, 5, 7, 9, 11 and 13) shall have fixed lengths which vary according to the test fire as given in Table I.1, with a tolerance of ± 10 mm.

I.3.2 Test conditions

The test fire shall be located indoors in a test chamber and shall be sheltered from draughts.

The ambient temperature shall be between 0 °C and 30 °C.

The test chamber shall have the following characteristics:

a) minimum height of the test chamber (internal): 8 m;

b) area around the class A frame there shall be a minimum distance of 3 m to the test house wall. (For example: In the case of a 8A, the room shall have a minimum length of 6,8 m and a minimum breadth of 6,5 m);

c) air and surrounding conditions: Minimum O_2 concentration throughout the test at a height of between 0,8 m and 1,5 m shall be 19 %. The measuring device shall be attached to the operator;

d) the maximum air speed before ignition shall be 0,2 m/s measured above the centre of the frame at a height of 0,2 m for horizontal airspeed and at a height of 1 m above the uppermost stick in the crib for vertical airspeed. The measurement shall be taken before the crib is ignited. During the test and

for 3 min after the test no characteristics of ventilation or airflow are allowed to change. The test starts by measurement of the air speed.

A metal lighting tray with a width of 600 mm and a depth of 100 mm shall be used. The length of the tray shall be 100 mm greater than the fire size.

The lighting tray shall be placed symmetrically beneath the crib forming the test fire.

Water shall be added to the tray to a depth of approximately 30 mm. Heptane of a quality identical to that used for the Class B fires (in accordance with I.4.2) shall then be added, the quantity being sufficient to give a burning time of 2 min 30 s.

I.3.3 Test procedure

The heptane shall be ignited.

After the fire has burnt for 2 min, the tray shall be withdrawn from beneath the crib.

The crib shall then be permitted to burn for a further 6 min, making a total pre-test time of 8 min, at which point the test fire can be considered to be established and extinction shall be commenced.

The operator shall then bring the extinguishing aerosol dispenser into use, and direct the discharge onto the test fire while moving round it at his own discretion in order to obtain the best result. The entire contents of the extinguishing aerosol dispenser may be discharged either continuously or in successive bursts.

The maximum extinguishing time shall not exceed 5 min. The operator shall indicate when the extinguishing aerosol dispenser is fully discharged or when the fire is extinguished within the permitted time.

In both cases the fire shall be observed for 3 min from that point. A new period of 3 min starts in the case of a re-operation within the permitted time.

For the test to be deemed successful all flames shall be extinguished and there shall be no recurrence of flames during the 3 min observation period.

If the class A crib collapses during the test, consider it void and carry out a replacement test as part of the set of three tests.

I.4 Class B fire test

I.4.1 Characteristics of test fire

Class B test fires shall be made in a range of welded sheet steel circular trays, the dimensions of which are given in Table I.2. The base shall be the same nominal thickness as the walls and the thickness tolerance of the base and wall material shall conform to the relevant national standard. Stiffening bars or sections may be welded to the underside of the base with a minimum distance of 200 mm between substantially parallel stiffeners. All tolerances specified relate to the tray at its time of manufacture.

The trays shall contain water, overlaid with a layer of fuel in the following proportion: 1/3 water, 2/3 fuel. The total volume of liquid in the tray shall be as specified in Table I.2, which will give a depth of water of approximately 10 mm, and a depth of fuel approximately 20 mm.

The test fires are designated by a number (which indicates the fire size) followed by the letter B. The number represents the volume of liquid, in litres, contained in the tray.

Table I.2 — Construction of class B test fires

Designation of test fire	Volume of liquid 1/3 water+2/3 fuel l	Internal diameter at rim mm	Depth mm	Dimensions of tray	
				Thickness of walls mm	Approximate area of fire m^2
21B	21	920 ± 10	150 ± 5	2,0	0,66
34B	34	1 170 ± 10	150 ± 5	2,5	1,07

The minimum height from the surface of the fuel to the rim of the tray shall be 100 mm.

The height from the ground to the rim of the tray shall not exceed 350 mm. The construction of the tray shall prevent the flow of air under the tray, or sand or earth shall be built around the tray up to but not above the level of the base.

After each test, a minimum of 5 mm of fuel shall remain.

For powder extinguishing aerosol dispensers, at least one fire in each series shall be successfully extinguished on a fresh water/fuel filling for the rating to be accepted.

For water based extinguishing aerosol dispensers, fresh fuel and water shall be used for each test.

I.4.2 Test conditions

The ambient temperature shall be between 0 °C and 30 °C. Class B Fire tests shall be carried out indoors.

The conditions shall be:

a) the height of the test chamber (internal) shall be equal to or greater than 5 times the diameter of the test fire tray;

b) the area of the test chamber in square metres (m^2) shall be equal to or greater than the test fire designation;

c) each side of the test chamber shall be equal to or greater than 4 times the diameter of the test tray with a minimum length of 7,5 m, see Table I.3. Air speed and surrounding conditions shall be as defined for Class A fires, see I.3.2 c) and d).

Table I.3 — Minimum dimensions of test chambers

Fire test B	Minimum height (tray x 5) m	Minimum side length (tray × 4) and 7,5 m whichever is the greatest m	Minimum ground area m^2
21	4,6	7,5	56
34	5,8	7,5	56

The fuel for the class B test fires shall be industrial heptanes, which shall have the following characteristics:

a) distillation curve: 84 °C to 105 °C, difference between initial and final points of distillation: ≤ 10 °C;

b) aromatic content (V/V): ≤ 1 %;

c) density at 15 °C: 0,680 to 0,720.

I.4.3 Test procedure

The heptane shall be ignited and then be permitted to burn for 1 min, at which point the test fire can be considered to be established and extinction shall commence within 10 s.

The operator shall then bring the extinguishing aerosol dispenser into use, and direct the discharge onto the test fire while moving round at their own discretion in order to obtain the best result. The entire contents of the extinguishing aerosol dispenser may be discharged either continuously or in successive bursts.

The operator shall indicate when the extinguishing aerosol dispenser is fully discharged or when the fire is extinguished.

For the test to be deemed successful, all flames shall be extinguished.

WARNING — At no time may the operator step into or onto the tray, for any reason.

I.5 Class F fire test

I.5.1 General

Extinguishing aerosol dispensers for use on cooking oil fires shall have a class F test fire rating.

Powder extinguishing aerosol dispensers should not be used on Class F fires as their use on this type of fire is considered hazardous. For this reason powder extinguishing aerosol dispensers shall not be tested according to this Annex I.

I.5.2 Characteristics of test fire

Extinguishing aerosol dispensers shall have a class F fire rating in accordance with Table I.4 when tested in accordance with I.5.4.

Table I.4 —Construction of Class F test fires

Rating	Volume of cooking oil in test fire l	Test apparatus mm
5F	5 (+1 –0)	Type A 300 ± 10
15F	15 (+1 –0)	Type B 448 × 224

The cooking oil test fires shall be conducted using a steel tray to simulate a deep fat fryer.

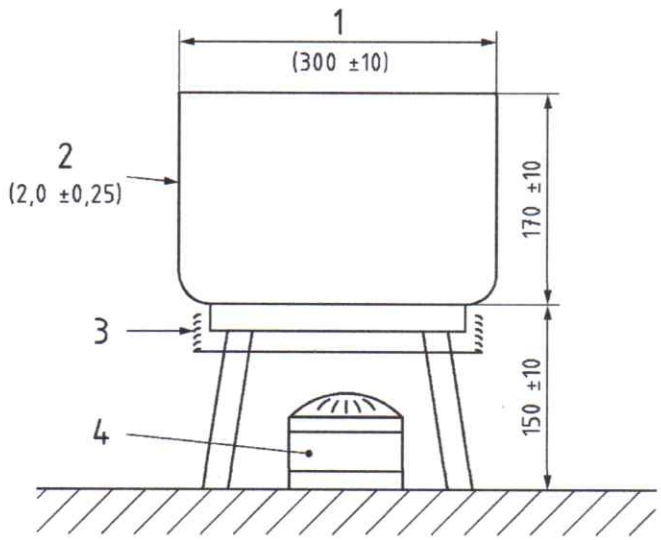
The type A fire test tray is constructed of steel sheet, (2,0 ± 0,25) mm thick and (170 ± 10) mm deep and mounted on a support structure, see Figure I.3.

The type B fire test tray is constructed of sheet steel (2,0 ± 0,25) mm thick and (250 ± 10) mm deep and mounted on a support structure, see Figure I.4.

In order to monitor the oil temperature, a thermocouple shall be located (25 ± 5) mm below the oil surface (before heating), but not closer than 75 mm to the test fire tray's walls.

Pure edible vegetable oil, with an auto-ignition temperature range of between 330 °C and 380 °C.

Dimensions in millimetres

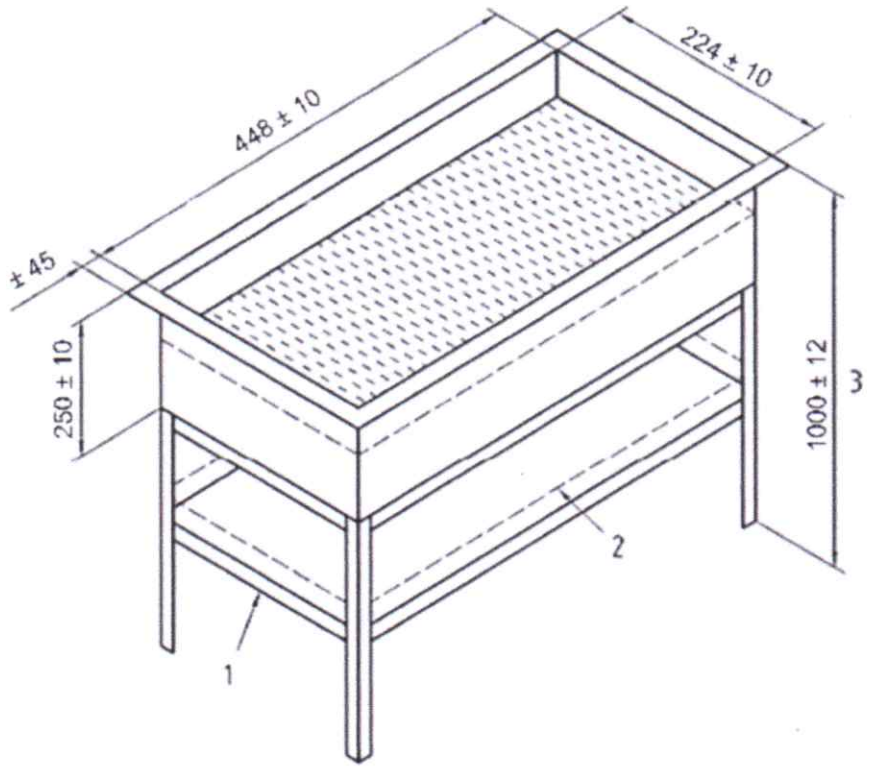


Key

1 Pan diameter
2 Nominal wall thickness
3 Skirt to suit burner type
4 Burner

Figure I.3 — Type A fire test apparatus - 5F

Dimensions in millimetres



Key

1 tray to support gas burners (alternatively electric heating may be used)

2 skirts to contain flames for gas heating to prevent piloted ignition

3 height to floor

Figure I.4 — Type B fire test apparatus - 15 F

I.5.3 Test conditions

The test chamber shall have the following characteristics:

a) minimum height of the test chamber (internal): 8 m;

b) area around the class F tray there shall be a minimum distance of 3 m to the test house wall. The room shall have a minimum length of 6,5 m and a minimum breadth of 6,5 m.

I.5.4 Test procedure

Heat the oil in the fire test tray using a suitable heating arrangement until non-piloted auto-ignition occurs.

Auto-ignition shall occur in a maximum time of 2 h from the start of heating of the apparatus.

When auto-ignition occurs turn off the heat source and allow to burn freely for 120_{0}^{+10} s before commencement of fire-fighting.

The operator shall discharge the entire contents without interruption, starting from a distance X as recommended by the manufacturer, see 9.2.1 d) on the label after the pre-burn time with a minimum of 1 m.

The attack shall take place from only one direction or side of the fire tray.

After each test, clean the apparatus thoroughly and renew with fresh oil prior to subsequent fire testing.

Care should be taken to avoid the fuel vapours being ignited by the heat source before auto ignition occurs.

Fire tests with extinguishing aerosol dispensers shall conform to the following requirements:

a) burning material shall not be ejected;

b) the fire shall be extinguished and there shall be no re-ignition of the test fire, or any overflow of fuel during a 20 min period following the complete discharge of the extinguishing aerosol dispenser;

c) oil shall remain in the tray at the end of the test to prove that extinguishment has occurred by application of the extinguishant and not by oil starvation;

d) the oil temperature shall be monitored at auto-ignition;

e) application of the media shall not cause enlargement of the flames.

   Flames over 2 m in height constitute enlargement. Short-term flame peaks (≤2 s in duration) above 2 m are acceptable;

f) video recording of the fire test shall be carried out to establish compliance with this requirement.

Annex J
(normative)
Dielectric test

NOTE See 5.9.

J.1 General

Prepare one extinguishing aerosol dispensers as described in A.1 and A.2.

J.2 Apparatus

J.2.1 Metallic plate, the target, 1 m × 1 m, hung vertically by insulators with no object or structure closer than:

— 1 m below the bottom of the plate;

— 1 m either side of the edges of the plate;

— 1 m from either face of the plate;

— 0,5 m above the top of the plate.

J.2.2 Trough or other container, arranged below the target plate to collect any liquid run off from the plate and insulated from earth.

J.2.3 High voltage transformer, enabling an alternating voltage of 35 kV to be established between the plate and earth.

The impedance of the circuit shall be such that when the secondary is short circuited and the primary supplied by a voltage equal to 10 % of its normal supply voltage, the secondary current is not less than 0,1 mA.

J.2.4 Insulating support to hold extinguishing aerosol dispenser.

J.3 Test procedure

The apparatus shall be set up in accordance with Figure J.1.

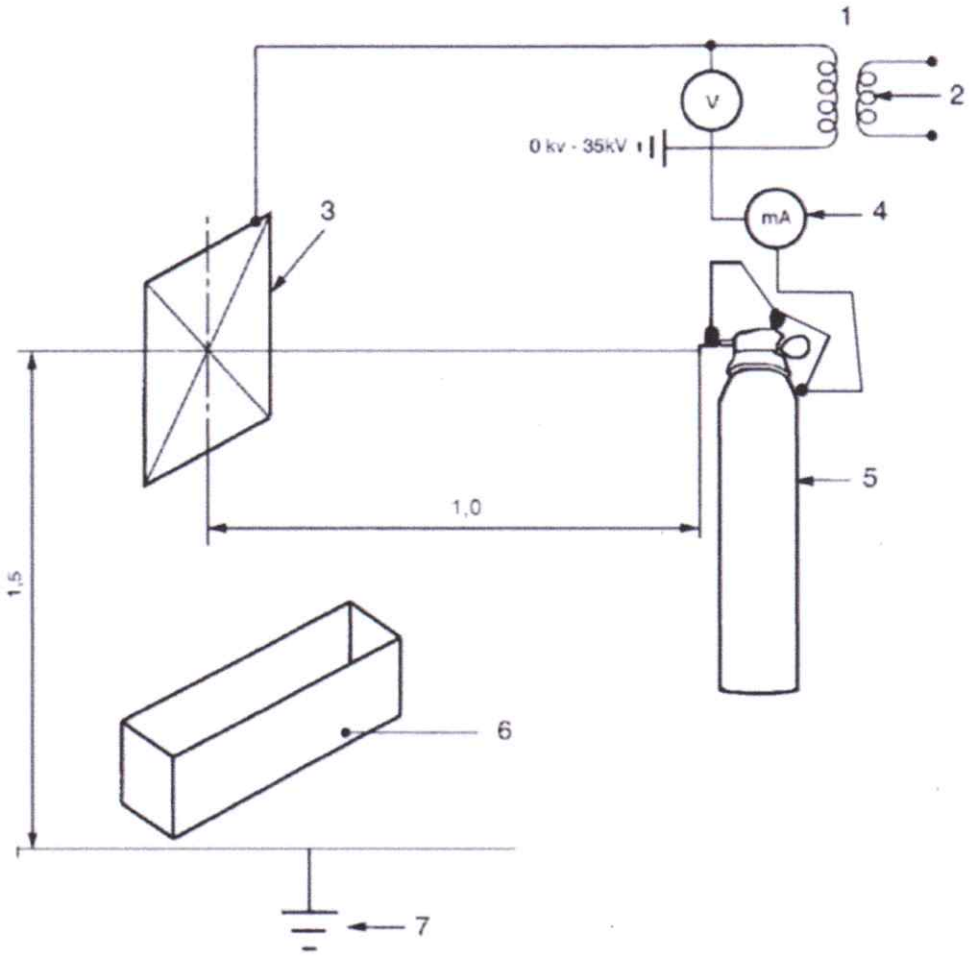
The extinguishing aerosol dispenser shall be fixed onto the insulating support and so arranged that the discharge nozzle, situated at 1m ± 50 mm from the plate, is directed towards its centre.

The current shall be measured with an ammeter connected in series between the handle of the body and the earth, the body and the earth and between the nozzle and the earth.

If no complete metallic path exits, between the extinguishing media and at least one of the above connection points to the measuring device, such a path shall be created for the purpose of the test.

Discharge the extinguishing aerosol dispenser, ensuring that the discharge media contacts the plate and measure and record the current.

Dimensions in metres



Key

1 Test transformer
2 Low voltage supply
3 Metallic plate
4 Ammeter
5 Extinguishing aerosol dispenser under test
6 Collecting trough (insulated from earth)
7 Earth

Figure J.1 — Schematic arrangement of apparatus for dielectric test

Annex K
(normative)
Chemical and pressure stability test

NOTE See 5.3.3.

Prepare the extinguishing aerosol dispensers as described in A.1, A.2 and A.3.2.

Select two extinguishing aerosol dispensers. Ensure that the rate of pressure loss shall not exceed 5 % of the working pressure per annum.

Store the extinguishing aerosol dispensers at 50^{+5}_{1} °C, one upright and one horizontal.

Record the internal pressure three times:

— the pressure recorded on day 2 is the reference pressure;

— the pressure recorded on day 60 shall not exceed 110 % of the reference pressure;

— the recorded pressure on day 180 shall show no increase over the pressure recorded on day 60.

At no time should the measured pressure exceed 15 bar.

Annex L
(informative)
Example of breakdown and order of tests

One or more additional samples may be required for the identification and verification of compliance with the plan.

Table L.1

Tests Clause + Annex	Preparation Annex A				Number of sample	Test
	A1	A2	A.3.1	A.3.2		
5.1.5, 5.1.6	X	X	/	/	1	Security seal
5.1.7, Annex F	X	X	/	/	1	Controllable device
5.3.1, B.1	X	X	/	/	6	External corrosion
5.3.2, B.2	X	X	/	x	10	Internal corrosion
5.3.3, Annex K	X	X	/	x	10	Chemical and pressure Stability test
5.4, Annex C	X	X	/	/	2	Impact test
5.5, Annex D	X	X	/	/	3	Mechanical drop test
5.6, E.2	X	X	/	/	1	Resistance to pressure
5.7, E.3	X	X	/	/	1	Minimum burst test
5.9, Annex J	X	X	/	/	1	Dielectric test
6.1	/	/	/	/	1	Filling requirement
6.3	/	/	/	X	1	Filling requirement
7.2, G.1	X	X	/	/	6	Duration of discharge
7.3, G.2	X	X	/	/	3	Intermittent discharge
7.4, Annex H	X	X	X	/	3	Partial discharge
7.5.2, I.3	X	X	/	/	3	Class A fire test
7.5.3, I.4	X	X	/	/	3	Class B fire test
7.5.4: I.5	X	X	/	/	3	Class F fire test
7.6, G.3	X	X	/	/	1	Effective throw
9.1, 9.2	/	/	/	/	1	Marking

Bibliography

[1] RAL 841 – GL Farbregister, *Primary standards of all 210 RAL CLASSIC colours*

[2] Regulation 1272/2008/EC, *Classification, labelling and packaging of substances and mixtures*

[3] Directive 75/324/EEC – *Approximation of the laws of the member states relating to aerosol dispensers*

[4] link to alternate method to the hot water bath, http://www.alpsleak.com/uploads/2009%20FEA%20RULES.pdf

[5] link to alternate method to the hot water bath, https://www.unece.org/fileadmin/DAM/trans/doc/2003/ac10c3/ST-SG-AC10-C3-2003-51e.pdf

[6] BS 8493:2008+A1:2010, *Light reflectance value (LRV) of a surface*

[7] Commission Directive 2008/47/EC of 8 April 2008 amending, for the purposes of adapting to technical progress, Council Directive 75/324/EEC on the approximation of the laws of the Member States relating to aerosol dispensers

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