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## Fire extinguishing media – Foam concentrates – Part 1: Specification for medium expansion foam concentrates for surface application to water-immiscible liquids

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 1568-1**

October 2000

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English version

**Fire extinguishing media - Foam concentrates - Part 1 :  
Specification for medium expansion foam concentrates for  
surface application to water-immiscible liquids**

Agents extincteurs - Emulseurs - Partie 1 : Spécifications  
pour les émulseurs moyen foisonnement destinés à une  
application à la surface des liquides n'ayant pas d'affinité  
pour l'eau

Feuerlöschmittel - Schaummittel - Teil 1 : Anforderungen  
an Schaummittel zur Erzeugung von Mittelschaum zum  
Aufgeben auf nicht-polare Flüssigkeiten

This European Standard was approved by CEN on 13 November 1999.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



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

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## Foreword

This European Standard has been prepared by Technical Committee CEN/TC 191 "Fixed firefighting systems", the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by April 2001, and conflicting national standards shall be withdrawn at the latest by April 2001.

This European Standard is one of a series specifying requirements for fire extinguishing media in common use. This series includes the following:

EN 25923	Fire protection - Fire extinguishing media - Carbon dioxide (ISO 5923:1989)
EN 27201-1	Fire protection - Fire extinguishing media - Halogenated hydrocarbons Part 1: Specification for halon 1211 and halon 1301 (ISO 7201-1:1989)
EN 27201-2	Fire protection - Fire extinguishing media - Halogenated hydrocarbons - Part 2: Code of practice for safe handling and transfer procedures (ISO 7201-2:1991)
EN 615	Fire protection - Fire extinguishing media - Specification for powder (other than Class D powders)

This standard is Part 1 of EN 1568 which has the general title "Fire extinguishing media - Foam concentrates". The other parts are, or will be:

Part 2: Specification for high expansion foam concentrates for surface application to water-immiscible liquids.

Part 3: Specification for low expansion foam concentrates for surface application to water-immiscible liquids

Part 4: Specification for low expansion foam concentrates for surface application to water-miscible liquids.

As fire-fighting foams are chemical preparations EC Directives 67/548/EEC, 76/464/EEC and 88/379/EEC apply and should be taken into account.

The annexes A and J are informative, the annexes B, C, D, E, F, G, H are normative.

Annex K is an A-Deviation for National Regulations applicable in Denmark and in Germany and is informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## Introduction

Classes of fire are defined in EN 2:1992 as follows:

- Class A: fires involving solid materials, usually of an organic nature, in which combustion normally takes place with the formation of glowing embers;
- Class B: fires involving liquids or liquefiable solids;
- Class C: fires involving gases;
- Class D: fires involving metals.

Fire fighting foams are widely used to control and extinguish Class B fires and to inhibit re-ignition. These foams can also be used for prevention of ignition of flammable liquids and, in certain conditions, to extinguish Class A fires.

Foams can be used in combination with other extinguishing media, particularly gaseous media and powders, which are the subject of other European Standards (see Foreword).

These specifications have been designed to ensure that fire extinguishing media have the minimum useful fire fighting capability. The user should ensure that the foam concentrates are used accurately at the concentration recommended by the manufacturer. Fire performances indicated by this standard can not replicate practical fire situations.

Foam concentrates of different types and manufacture should not be mixed.

It should be noted that some combinations of extinguishing powder and foam can lead to unacceptable loss of efficiency, caused by unfavourable interaction of the chosen media when applied simultaneously or successively to the fire.

It is extremely important that the foam concentrate after dilution with water to the recommended concentration should not in normal usage present a significant toxic hazard to life in relation to the environment. The current versions of EC Directives 67/548/EEC, 76/464/EEC and 88/379/EEC apply when considering the testing of ecotoxicological properties and safety in the work environment.

## 1 Scope

This European Standard specifies requirements for chemical and physical properties, and minimum performance requirements of medium expansion foams suitable for surface application to water-immiscible liquids. Requirements are also given for marking.

NOTE: Some concentrates complying with this Part of EN 1568 can also comply with other Parts and therefore can also be suitable for application as low and/or high expansion foams.

## 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 ISO 3104	Petroleum products - Transparent and opaque liquids - Determination of kinematic viscosity and calculation of dynamic viscosity (ISO 3104:1994)
ISO 304	Surface active agents - Determination of surface tension by drawing up liquid films
ISO 3310-1:1990	Test sieves - Technical requirements and testing - Part 1 : Test sieves of metal wire cloth
ISO 3696	Water for analytical laboratory use - Specification and test methods

### 3 Terms and definitions

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

#### 3.1

##### **25%/ 50 % drainage time**

time taken for 25%/50 % of the volume of the original foam solution to drain out of the generated foam.

#### 3.2

##### **expansion**

ratio of the volume of foam to the volume of the foam solution from which it was made.

#### 3.3

##### **low expansion foam**

foam which has an expansion ratio not greater than 20.

#### 3.4

##### **medium expansion foam**

foam which has an expansion ratio greater than 20 but not greater than 200.

#### 3.5

##### **high expansion foam**

foam which has an expansion ratio greater than 200.

#### 3.6

##### **fire-fighting foam**

aggregate of air filled bubbles formed from a foam solution used for fire fighting.

#### 3.7

##### **foam concentrate**

liquid which is diluted with water to produce foam solution.

NOTE: Annex A gives information on grades of foam concentrate.

#### 3.8

##### **foam solution**

solution of foam concentrate in water.

#### 3.9 sediment

insoluble particles in the foam concentrate.

#### 3.10

##### **spreading coefficient**

value which indicates the ability of one liquid to spread spontaneously across the surface of another.



### **3.11**

#### **newtonian foam concentrates**

foam concentrates which have a viscosity which is independent of the shear rate.

### **3.12**

#### **pseudoplastic foam concentrates**

foam concentrates which have a viscosity which decreases with increasing shear rate.

## **4 Sediment in the foam concentrate**

### **4.1 Sediment before ageing**

Any sediment in the foam concentrate sampled in accordance with annex B, but not aged in accordance with C.1, shall be dispersible through a 180 µm sieve, and the percentage volume of sediment shall be not more than 0,25 % when tested in accordance with annex C.

### **4.2 Sediment after ageing**

Any sediment in the foam concentrate sampled in accordance with annex B, and aged in accordance with C.1, shall be dispersible through a 180 µm sieve and the percentage volume of sediment shall be not more than 1,0 % when tested in accordance with annex C.

## **5 Viscosity of the foam concentrate**

### **5.1 Newtonian foam concentrates**

The viscosity of the foam concentrate at the lowest temperature for use claimed by the manufacturer, shall be determined in accordance with EN ISO 3104.

### **5.2 Pseudoplastic foam concentrates**

The viscosity of the foam concentrate shall be determined in accordance with annex D.

## **6 pH of the foam concentrate**

The pH of the foam concentrate sampled in accordance with annex B shall be not less than 6,0 and not more than 9,5 at  $(20 \pm 1)$  °C.

## **7 Surface tension of the foam solution**

The surface tension (determined in accordance with F.2.1) of the foam solutions prepared using top and bottom samples (see E.4) of the foam concentrate sampled in accordance with annex B and conditioned in accordance with annex E shall be not less than 0,95 times and not more than 1,05 times the surface tension (determined in accordance with F.2.1) of the foam solution prepared using the foam concentrate sampled in accordance with annex B.

## 8 Spreading coefficient of the foam solutions

NOTE: The spreading coefficient indicates the possibility of film forming, but it does not measure its quality. Certain properties of film-forming foams are not defined by this standard.

### 8.1 Before temperature conditioning

The foam solution prepared using the concentrate, if it is claimed by the supplier to be "film-forming", sampled in accordance with annex B shall have a positive spreading coefficient over cyclohexane when tested in accordance with F.2.2.

### 8.2 After temperature conditioning

The foam solution prepared using top and bottom samples, see E.4, of the foam concentrate, if it is claimed by the supplier to be "film-forming", sampled in accordance with annex B and conditioned in accordance with annex E, shall have a positive spreading coefficient over cyclohexane when tested in accordance with F.2.2.

## 9 Expansion and drainage of foam

### 9.1 Before temperature conditioning

The foam produced from the foam solution prepared from the foam concentrate sampled in accordance with annex B, at the suppliers recommended concentration with potable water shall be tested in accordance with annex G. If appropriate, a further sample of the same concentration made with the simulated sea water of G.4 shall also be tested.

NOTE: Expansion is dependent on the foam concentrate and the equipment used to make the foam. The test equipment of G.1 tends to give expansions higher than some other equipment so the expansion limit is above the 200 limit for medium expansion (see 3.4).

### 9.2 After temperature conditioning

The foams produced from the foam solutions, prepared using top and bottom samples, see E.4, of the foam concentrate, sampled in accordance with annex B, at the suppliers recommended concentration, and if appropriate further samples at the same concentration made with the simulated sea water of G.4, when tested in accordance with annex G, shall have the following:

- a) expansion values not less than 50; and
- b) expansion values which do not differ from each other or from the value obtained in 9.1 (i.e. before temperature conditioning) by more than 20 % of the value obtained in 9.1; and

- c) 50 % drainage times which do not differ from each other or from the value obtained in 9.1 (i.e. before temperature conditioning) by more than 20 % of the value obtained in 9.1.

## 10 Test fire performance

The foam produced from foam solutions prepared using the foam concentrate sampled in accordance with annex B at the supplier's recommended concentration with potable water, and if appropriate at the same concentration with the simulated sea water of G.4, shall have an extinction time not more than 120 s and a 1 % burnback time not less than 30 s, when tested in accordance with H.1 and H.2.

NOTE : The values obtained with seawater can differ from those obtained with potable water.

## 11 Container marking

The following information shall be marked on the packaging or transport container:

- a) the designation (identifying name) of the concentrate;
- b) the words "medium expansion fire-fighting foam concentrate" and the number and date of this European Standard (i.e. EN 1568-1:2000);

NOTE: For medium expansion concentrates which also conform to other Parts of EN 1568 additional markings may be used as given in those Parts.

- c) if the concentrate conforms to clause 8 the words "film-forming";
- d) recommended usage concentration (most commonly 1 %, 3 % or 6 %);
- e) any tendency of the foam concentrate to cause harmful physiological effects, the methods needed to avoid them and the first aid treatment if they should occur;
- f) recommended maximum storage temperature and lowest temperature for use;
- g) if the concentrate does not conform to clause 7, 8.2 and 9.2 after conditioning in accordance with E.2, the words "Do not store below 0 °C";
- h) the nominal quantity in the container;
- i) the supplier's name and address;
- j) the batch number and the date of manufacture;
- k) the words "Not suitable for use with sea water" or "Suitable for use with sea water" as appropriate.