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## Fire protection — Foam fire extinguishing systems —

### Part 6: Vehicle-mounted compressed air foam systems

*Protection contre l'incendie — Systèmes d'extinction d'incendie à mousse — Partie 6: Équipement pour mousse physique à air comprimé monté sur véhicules*

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents). ISO shall not be held responsible for identifying any or all such patent rights.

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 21, *Equipment for fire protection and fire fighting*, Subcommittee SC 6, *Foam and powder media and firefighting systems using foam and powder*.

This second edition cancels and replaces the first edition (ISO 7076-6:2016), which has been technically revised. It also incorporates the Amendment ISO 7076-6:2016/Amd. 1:2020.

The main changes are as follows:

- ~~— Followings are added or modified as per the modification indicated in 4.3.2.5 ISO 7076-6:2016/Amd1:2020.~~
- ~~— 4.3.2.5 The, the~~ deviation from the set proportioning ratio has been modified;
- ~~— Clause 6 Modification of the title of Clause 6 has been modified; within the clause, a citation to Annex B has been added.~~
- ~~— in Table A.1, the rows for 4.2.3.3 and 4.2.4.1 addition of new Annex B.~~
- ~~— Table A.1 Description, the descriptions in the “individual assessment” has column have been modified in 4.2.3.3 and 4.2.4.1;~~
- ~~— Annex B — has been added;~~
- editorial corrections have been made throughout the document.

A list of all parts in the ISO 7076 series can be found on the ISO website.

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Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

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## Introduction

Compressed air foam systems (CAFS) conforming to this document are installed in fire-fighting vehicles, or used in conjunction with fire-fighting vehicles, to improve the efficiency of fire-extinguishing processes. CAFS improve the adhesion, penetration and retention time of the fire-extinguishing agent on the burning material, thereby transferring more energy and improving the cooling effect of the applied foam. This is achieved by adding foam concentrates and compressed air, to be delivered into water under pressure by the fire-fighting pump, to the fire.

CAFS generate homogeneous foam that increases the effective contact area of the foam on the burning material. This improves the adhesion and penetration of the foam to non-horizontal surfaces of the burning material, thereby increasing the period in which heat is effectively transferred.

It is assumed that systems defined in this document ~~will~~ only ~~be~~ operated by suitably trained personnel.

For CAFS to be used at a temperature outside the temperature range defined in this document (i.e. from  $-10\text{ }^{\circ}\text{C}$  to  $+40\text{ }^{\circ}\text{C}$ ), the particular temperature range is specified by the user. The manufacturer should determine any need for additional precautions by means of a risk assessment.

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## Fire protection — Foam fire extinguishing systems —

### Part 6: Vehicle-mounted compressed air foam systems

#### 1 Scope

This document specifies requirements for compressed air foam systems (CAFS) in which foam concentrate and compressed air are continuously added to the water being discharged from the fire-fighting pump. This document is applicable to CAFS that can be permanently installed in fire-fighting vehicles, or that are transportable or mobile.

This document specifies requirements for CAFS which are used at ambient temperatures ranging from  $-10\text{ }^{\circ}\text{C}$  to  $+40\text{ }^{\circ}\text{C}$ .

~~For CAFS to be used at a temperature outside this temperature range, the particular temperature range is specified by the user. The manufacturer shall determine any need for additional precautions by means of a risk assessment.~~

This document does not apply to stationary CAFS.

This document does not apply to requirements for hazards related to handling foam concentrates, noise generated by CAFS, drives, auxiliary equipment, power sources, or pumps connected to the CAFS.

This document does not specify requirements for special hazards arising from particular conditions under which CAFS are used, for example:

- ~~immunity against electromagnetic fields and electrostatic discharge;~~
- ~~operation without supervision;~~
- ~~events specific to the location where the CAFS is set up (e.g. on public roads);~~
- ~~handling of any equipment, devices, etc. which have to be connected to the CAFS or are joined to it (e.g. branch pipes, nozzles and pressure hoses);~~
- ~~decommissioning and disposal.~~

#### 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 7000, *Graphical symbols for use on equipment — Registered symbols*

ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

ISO 13854, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*

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ISO 13857, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs*

ISO 13943, *Fire safety — Vocabulary*

ISO 14120, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

IEC 60068-1, *Environmental testing — Part 1: General and guidance*

IEC 60204-1, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

IEC 61310-2, *Safety of machinery — Indication, marking and actuation — Part 2: Requirements for marking*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13943 and the following apply.

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

~~— IEC Electropedia: available at~~

— ~~—~~ ISO Online browsing platform: available at <https://www.iso.org/obp>

— ~~IEC Electropedia: available at~~ <https://www.electropedia.org/>

#### 3.1

##### **air delivery rate**

volume of air, in ambient conditions, that is fed into the *compressed air foam systems* (3.5), per unit of time

Note 1 to entry: The measurement unit is l/min.

#### 3.2

##### **compressed air foam**

mixture of water, foam concentrate and compressed air

#### 3.3

##### **compressed air foam delivery pressure**

pressure of *compressed air foam* (3.2) at the delivery outlet of the *compressed air foam systems* (3.5)

Note 1 to entry: The measurement ~~units are~~unit is MPa.

#### 3.4

##### **compressed air foam delivery rate**

volume of *compressed air foam* (3.2) at the delivery outlet of the *compressed air foam systems* (3.5), converted at atmospheric pressure, per unit of time

Note 1 to entry: The measurement unit is l/min.

**3.5  
compressed air foam system  
CAFS**

system in which a foam concentrate and air are continuously added under pressure to the water being discharged from a fire-fighting pump

**3.6  
dry foam**

*compressed air foam* (3.2) defined by a nominal *foam solution/air volume ratio* (3.9) greater than 1:10, being mixed in the *compressed air foam systems* (3.5)

**3.7  
flushing procedure**

process to ensure that pipework associated to the foam proportioning system is adequately cleaned of foam concentrate and solution up to the discharge connection to avoid any damage

EXAMPLE Procedure to avoid damage by corrosion.

**3.8  
foam concentrate delivery rate**

volume of foam concentrate fed into *compressed air foam systems* (3.5), per unit of time

Note 1 to entry: The measurement unit is l/min.

**3.9  
foam solution/air volume ratio**

relationship between parts of liquid (foam solution) and air (at atmospheric pressure) being mixed together in a *compressed air foam system* (3.5) mixing device

**3.10  
foam solution delivery rate**

volume of foam solution delivered per unit of time by a system

Note 1 to entry: The measurement unit is l/min.

Note 2 to entry: At *proportioning ratios* (3.12) of up to 1 %, the difference between *water delivery rate* (3.13) and foam solution delivery rate can be neglected.

**3.11  
operating range**

range (of conditions) specified by the manufacturer of a system and within which the CAFS can be operated without limitations while achieving the intended performance characteristics

**3.12  
proportioning ratio**

amount of foam concentrate added to water given as a percentage in the foam solution

**3.13  
water delivery rate**

volume of water fed into *compressed air foam systems* (3.5) per unit of time

Note 1 to entry: The measurement unit is l/min.