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Vgrajeni gasilni sistemi - Sistemi za gaġenje s kondenziranim aerosolom - 2. del: Naļ rtovanje, vgradnja in vzdrġevanje

Fixed firefighting systems - Condensed aerosol extinguishing systems - Part 2: Design, installation and maintenance

Ortsfeste Brandbekämpfungsanlagen - Löschanlagen für kondensierte Aerosole - Teil 2: Planung, Installation und Wartung

Installations de lutte contre l'incendie - Systèmes d'extinction a aérosol - Partie 2 : Calcul, installation et maintenance

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Fixed firefighting systems - Condensed aerosol extinguishing systems - Part 2: Design, installation and maintenance

Installations fixes de lutte contre l'incendie - Systèmes d'extinction à aérosol - Partie 2 : Calcul, installation et maintenance

Ortsfeste Brandbekämpfungsanlagen - Löschanlagen für kondensierte Aerosole - Teil 2: Planung, Installation und Instandhaltung

This Technical Report was approved by CEN on 9 September 2008. It has been drawn up by the Technical Committee CEN/TC 191.

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Foreword

This document (CEN/TR 15276-2:2009) has been prepared by Technical Committee CEN/TC 191 “Fixed firefighting systems”, the secretariat of which is held by BSI.

This document has the general title *Fixed firefighting systems — Condensed aerosol extinguishing systems* and will consist of the following parts:

— Part 1: *Requirements and test methods for components;*

— Part 2: *Design, installation and maintenance.*

Introduction

It has been assumed in the preparation of this document that the execution of its provisions is entrusted to appropriately qualified and experienced people in the specification, design, installation, testing, approval, inspection, operation and maintenance of systems and equipment, for whose guidance it has been prepared, and who can be expected to exercise a duty of care to avoid unnecessary release of extinguishant.

Product certification: Users of this document are advised to consider the desirability of independent certification of product conformity with this document based on testing and continuing surveillance, which may be coupled with assessment of manufacturer quality systems against EN ISO 9001.

Fire-fighting systems covered in this document are designed to provide a supply of fixed condensed aerosol extinguishing medium to extinguish fire.

The requirements of this document are made in the light of the best technical data known to the working group at the time of writing but, since a wide field is covered, it has been impracticable to consider every possible factor or circumstance that might affect implementation of the requirements.

It is important that the fire protection of a building or plant be considered as a whole. Aerosol extinguishant systems form only a part of the available facilities, but it should not be assumed that their adoption necessarily removes the need to consider supplementary measures, such as the provision of portable fire extinguishers or other mobile appliances for first aid or emergency use, or to deal with special hazards.

Small scale fire tests, comparable with the test methods mentioned in this standard, indicate that aerosol extinguishants can be recognized as effective media for the extinction of certain Class A fires (solid surface burning fires) and Class B and Class C fires according to EN 2, but it should not be forgotten, in the planning of comprehensive schemes, that there may be hazards for which these mediums are not suitable, or that in certain circumstances or situations there may be dangers in their use requiring special precautions.

Advice on these matters can be obtained from the appropriate manufacturer of the aerosol generators or the extinguishing system. Information may also be sought from the appropriate fire authority, the health and safety authorities and insurers. In addition, reference should be made as necessary to other national standards and statutory regulations.

It is essential that fire-fighting equipment, the enclosure and the protected occupancy is carefully maintained and managed to ensure instant readiness when required and effectiveness of the protection. Routine maintenance is liable to be overlooked or given insufficient attention by the owner of the system. It is, however, neglected at peril to the lives of occupants of the premises and at the risk of crippling financial loss. The importance of maintenance cannot be too highly emphasised.

Condensed aerosol may contain traces of toxic substances like those produced by a fire, and will obscure vision like smoke from fire. This standard requires, as a precaution, that the room is evacuated and sealed off whenever a generator is activated - much like recommended response to fires. Precautions include evacuation of the proximity area, criteria for re-entering and other safeguards as stated in paragraph 5.

1 Scope

This document specifies requirements and describes the methods for the design, installation, testing, maintenance and safety of condensed aerosol extinguishing systems and the characteristics of the extinguishant media and types of fire for which it is a suitable extinguishing medium.

This document also covers the use of condensed aerosol extinguishing systems for total flooding applications in normally unoccupied and unoccupiable areas, primarily related to buildings, plant and other specific applications, utilising electrically non-conducting aerosol fire extinguishants and for which there are sufficient data available to enable validation of performance characteristics by an appropriate independent authority.

This document is intended as a standard covering solely condensed aerosol.

This document is not applicable to explosion suppression applications.

This document is not intended to indicate approval of the extinguishants listed herein by the appropriate authorities, as other extinguishants may be equally acceptable.

This document is applicable to the extinguishants which fulfil CEN/TR 15276-1.

2 Normative references

The following referenced documents are indispensable for the application 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 54 (all parts), *Fire detection and fire alarm systems*

EN 12094-1, *Fixed firefighting systems — Components for gas extinguishing systems — Part 1: Requirements and test methods for electrical automatic control and delay devices*

CEN/TR 15276-1:2009, *Fixed firefighting systems — Condensed aerosol extinguishing systems — Part 1: Requirements and test methods for components*

EN 50110, *Operation of electrical installations*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in CEN/TR 15276-1:2009 and the following apply.

3.1
actuating mechanism
automatic or manual activation leading to the physical discharge of extinguishant

3.2
approved
acceptable to a relevant authority

3.3
authority
organisation, office or individual responsible for approving equipment, installations or procedures in determining acceptability

NOTE The authority may base acceptance on conformity to the appropriate standards.

3.4
automatic
performing a function without the necessity of intentional intervention

3.5
automatic/manual switch
means of converting the system from automatic to manual actuation

NOTE This may be in the form of a manual switch on the control panel or other units, or a personnel door interlock. In all cases, this changes the actuation mode of the system from automatic and manual to manual only or vice versa.

3.6
clearance

3.6.1
electrical clearance
unobstructed air distance between extinguishing system equipment and unenclosed or uninsulated live electrical components not at ground potential

3.6.2
thermal clearance
air distance between a condensed aerosol generator and any structure or components sensitive to the temperature developed by the generator

3.7
competent person
designated person, suitably trained, qualified by knowledge and practical experience and with the necessary instructions to enable the required tests and examinations to be carried out

3.8
condensed aerosol
extinguishing medium consisting of finely divided solid particles and gaseous matter, these being generated by a combustion process of a solid aerosol-forming compound

3.9
condensed aerosol generator
non-pressurised device which, when activated, generates an aerosol

NOTE It includes the mounting brackets.

3.10
control device
device which is able to control the sequence of events leading to the activation

3.11
coolant
heat absorbing medium or process

3.12
design application density (g/m^3)
extinguishing factor multiplied by the safety factor, required for system design purposes

NOTE 1 The design factor is expressed in grams per cubic metre.

NOTE 2 Extinguishing factor and design factor have been introduced as an alternative to extinguishing concentration and design concentration respectively as concentration of the actual aerosol cannot be measured or even assessed in some cases (the discharged medium, apart from the condensed aerosol, may contain products of the thermal decomposition of a chemical coolant).

3.13
design quantity
mass of solid aerosol-forming composition necessary to achieve the design factor (density) in the maximum protected volume of a specific risk

NOTE The design quantity is expressed in grams.

3.14
discharge time
time from the generator activation to the end of its discharge

3.15
extinguishing application density
the minimum mass of a specific aerosol-forming compound per cubic meter of enclosure volume required to extinguish fire involving a specific fuel under defined experimental conditions, using a specific aerosol generator type and size, excluding any safety factor.

NOTE The extinguishing factor is expressed in grams per cubic metre.

3.16
family
group of generators with same solid compound, same kind of cooling device, same kind of discharge outlet, same ignition device, same layout and same internal/external architecture

3.17
holding time
period of time during which the extinguishant is required to maintain at least the extinguishing application density throughout the protected area/volume.

3.18
hot work
grinding, welding, thermal or oxygen cutting or heating and other related heat-producing or spark-producing operations

3.19
ignition device
device which is able to ignite the solid aerosol-forming compound

3.20
inspection
visual check to give a reasonable assurance that the extinguishing system is ready to operations

3.21
listing authority
recognized fire protection testing and approval body (notified laboratory)

3.22
location drawing
plan of the risk clearly indicating the as-installed location of all aerosol generators, controls and maintenance isolate switch (lock off devices)

3.23
lock-off device
manual shut-off device that prevents the electrical actuation of aerosol generators

NOTE The device operation provides an indication of system isolation.

3.24
lowest observed adverse effect level
LOAEL
lowest agent factor at which an adverse toxicological or physiological effect has been observed

3.25
maintenance
thorough check to give maximum assurance that the extinguishing system will operate as intended

NOTE It includes a thorough examination and any necessary repair or replacement of system components.

3.26
manual
requiring intentional intervention to accomplish a function

3.27
manufacturer
legal person that is responsible for the design, manufacturing, packaging and quality insurance of a device before it is placed on the market

3.28
monitoring
supervision of the operating integrity of an electrical, mechanical, pneumatic or hydraulic control feature of a system

3.29
no observed adverse effect level
NOAEL
highest agent factor at which no adverse toxicological or physiological effect has been observed

3.30
normally unoccupied area
area that is not occupied by persons under normal circumstances but may be entered occasionally for brief periods

3.31
protected volume
volume enclosed by the building elements around the protected enclosure, minus the volume of any permanent impermeable building element within the enclosure

3.32
release
physical discharge or emission of an aerosol as a consequence of the generator actuation

3.33
safety factor
multiplier of the extinguishing factor to determine the aerosol design factor

3.34
solid aerosol-forming compound
mixture of oxidant, combustible component and technical admixtures producing fire extinguishing aerosol upon ignition

3.35
supplier
legal person that is responsible for the product and is able to ensure that its quality is ensured

3.36
system isolate switch
see lock-off device (3.23)

3.37
thermal ignition device
device, which automatically operates at a rated temperature and is arranged for the ignition of the solid aerosol-forming compound

3.38
total flooding system
fire-fighting system arranged to discharge extinguishant into an enclosed space to achieve the appropriate design factor

3.39
unoccupiable area
area which cannot be occupied due to dimensional or other physical constraints e.g. shallow voids, cabinets

3.40
user
legal person, whom the system is designed for, and who is responsible for operation and to ensure the consistency of performance as described by the supplier and to follow the legal regulations

4 Use and limitations

4.1 General

The design, installation, service and maintenance of aerosol generators should be performed by those competent persons in fire extinguishing system technology.

The hazards against which these aerosol generators offer protection, and any limitations on their use, should be contained in the system supplier's design manual.

The total flooding use of aerosol generators is primarily for protection against hazards that are within an enclosure that will permit to establish and maintain the appropriate design factor of condensed aerosol for the required period of time to assure an effective extinguishment. Local applications are not covered by this standard.

Effects of agent particulate residue on sensitive equipment and other objects should be considered when using condensed aerosol extinguishing agents in spaces containing that type of equipment.