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Vgrajeni gasilni sistemi - Sistemi s pršečo vodo - 2. del: Zahteve in preskusne metode za šobe

Fixed firefighting systems - Water mist systems - Part 2: Product characteristics and test methods for nozzles

Ortsfeste Brandbekämpfungsanlagen - Wassernebelsysteme - Teil 2: Anforderungen und Prüfverfahren für Düsen

Installations fixes de lutte contre l'incendie - Systèmes à brouillard d'eau - Partie 2 : Caractéristiques de produit et méthodes d'essai pour les diffuseurs

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Fixed firefighting systems - Water mist systems - Part 2: Product characteristics and test methods for nozzles

Installations fixes de lutte contre l'incendie - Systèmes à brouillard d'eau - Partie 2 : Caractéristiques de produit et méthodes d'essai pour les diffuseurs

Ortsfeste Brandbekämpfungsanlagen - Wassernebelsysteme - Teil 2: Produkteigenschaften und Prüfverfahren für Düsen

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

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European foreword

This document (EN 17450-2:2024) 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of an identical text or by endorsement, at the latest by April 2025, and conflicting national standards shall be withdrawn at the latest by April 2025.

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.

EN 17450, *Fixed firefighting systems — Water mist systems*, consists of the following parts:

— Part 1: *Product characteristics and test methods for strainer and filter components*

— Part 2: *Product characteristics and test methods for nozzles*

— Part 3: *Product characteristics and test methods for check valves*[1]

— Part 4: *Product characteristics and test methods for control deluge valves and actuators*[1]

— Part 5: *Product characteristics and test methods for pressure switches*[1]

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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[1] Under preparation.

1 Scope

This document specifies product characteristics and test methods of open nozzles and automatic nozzles for use in water mist systems.

NOTE All pressure data in this document are given as gauge pressures in bar [2].

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 12259-1, *Fixed firefighting systems — Components for sprinkler and water spray systems — Part 1: Sprinklers*

EN 14972 (all parts), *Fixed firefighting systems — Water mist systems*

EN 60751, *Industrial platinum resistance thermometers and platinum temperature sensors*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 14972-1 and the following apply.

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

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

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

3.1
nozzle filter element
element that collects the particles

EXAMPLE A mesh.

3.2
nominal cross section (size)
calculated cross section on basis of the nominal diameter

3.3
pressure loss
differential pressure between inlet and outlet of the filter

3.4
operating pressure
constant or time-dependent pressure at a nozzle during discharge

3.5
stand-by pressure
pressure in the pipework at a closed automatic nozzle, prior to the activation of the nozzle

Note 1 to entry: This can be static pressure or flowing pressure.

[2] bar = 10^5 Pa.

Note 2 to entry: This can be higher or lower than the operating pressure.

3.6
maximum stand-by pressure
highest pressure to which the installed nozzle is exposed, due to the effects of the pressure maintenance device and head of water

Note 1 to entry: Specified by the manufacturer.

3.7
minimum stand-by pressure
lowest pressure to which the installed nozzle is exposed, due to the effects of the pressure maintenance device and head of water

Note 1 to entry: Specified by the manufacturer.

3.8
maximum operating pressure
highest pressure at the nozzle inlet while operating

Note 1 to entry: Specified by the manufacturer.

3.9
minimum operating pressure
lowest pressure at the nozzle inlet while operating

Note 1 to entry: Specified by the manufacturer.

3.10
release element
part of a nozzle which activates the discharge of the nozzle after thermal or other activation method

3.11
response time index
RTI
measure of the thermal sensitivity of the nozzle expressed in (meters seconds)$^{1/2}$ (m s)$^{1/2}$

3.12
conductivity factor
C-Factor
measure of the conductance between the nozzles heat responsive element and the water filled fitting, expressed in (meters/second)$^{1/2}$ (m/s)$^{1/2}$

4 Product characteristics

4.1 General

The nozzles used in water mist fire protection systems shall be representative of production nozzles and shall pass all of the applicable requirements specified in this document.

All nozzles with orifice diameters less than 2,5 mm shall be equipped with a nozzle filter. The size of the nozzle filter element shall be at least 1,5 times the nominal cross section area of the sum of the orifices behind the filter itself. The filter shall not have a bigger mesh size, i.e. grade of filtration, than 80 % of the smallest nozzle orifice diameter behind the filter itself.

Nozzle types tested in accordance with this document shall be the same as those that have successfully passed the fire tests according to the relevant part of the EN 14972 series.

The nozzles shall be compared according to 5.2.1.

As an optional test the water distribution can be tested according to Annex B.

4.2 Nominal operating temperature for automatic nozzles

The nominal operating temperatures of automatic nozzles are given in Table 1. The glass bulb liquid or the yoke arm(s) of automatic nozzles shall be colour coded according to Table 1.

The nominal operating temperature shall be according to 5.2.2.

Table 1 — Nominal operating temperatures and colour codes

Glass bulbs		Fusible links	
Nominal operating temperature °C	**Liquid colour code**	**Nominal operating temperature within range** °C	**Yoke arm(s) colour code**
57	orange	57 to 77	uncoloured
68	red	80 to 107	white
79	yellow	121 to 149	blue
93	green	163 to 191	red
100	green	204 to 246	green
121	blue	260 to 302	orange
141	blue	320 to 343	black
163	mauve	–	–
182	mauve	–	–
204	black	–	–
227	black	–	–
260	black	–	–
286	black	–	–
343	black	–	–

4.3 Thermal response of automatic nozzles

The RTI value shall be verified with tests according to 5.3. In the most unfavourable orientation the average RTI values shall not exceed 250 % of the average RTI values in the standard orientation.

4.4 K-factor

All K-factors shall vary less than ± 5 % from manufacturer specifications when tested in accordance with 5.4.

4.5 Function of nozzles

4.5.1 Automatic nozzles

For automatic nozzles, when tested in accordance with 5.5.1, the water mist nozzle shall open and within 5 s of release of the release element shall operate as intended. Any lodgement of released parts shall be cleared within 60 s of the release of the release element.

For nozzles with deflectors or separate/moving parts for the development of a spray, when tested in accordance with 5.5.1, the deflector and its supporting parts shall operate as intended.

4.5.2 Open nozzles

For open nozzles with blow-off caps, when tested in accordance with 5.5.2, the cap shall fully release within 5 s and not impede the discharge at any time.

4.6 Strength of nozzle body and deflector

4.6.1 Mechanical strength test

When tested in accordance with 5.6.1, the water mist nozzle body shall not show permanent elongation of more than 0,2 % in relation to the distance between the load bearing parts at the end of the test.

If the testing of this requirement is not applicable due to the design of the nozzle, the nozzle shall be pressure tested according to 4.6.2.

4.6.2 Hydrostatic strength test

This test shall only be applied when the test under 4.6.1 is not applicable.

When tested in accordance with 5.6.2, the water mist nozzle body shall not show leakage or permanent elongation of more than 0,2 % in relation to the distance between the load bearing parts at the end of the test.

4.6.3 Strength of nozzle deflector and its supporting or moving parts

For nozzles with deflectors (or other protruding parts which impinge upon the water discharge and alter the spray pattern, or moving parts regardless of their position), when tested in accordance with 5.6.3, the water mist nozzle deflector and its supporting or moving parts shall not be damaged or deformed and shall remain intact.

4.7 Strength of release element of automatic nozzles

4.7.1 General

The testing of release elements shall be done as described in 4.7.2 and 4.7.3.

4.7.2 Automatic nozzles using glass-bulbs

The design lower tolerance limit of bulb strength according to EN 12259-1 (0,99 confidence for 99 % of samples) shall be greater than twice the design upper tolerance limit of the bulb/nozzle assembly load including the highest calculated water pressure on nozzle. Nozzles shall be tested and comply with the requirements described in 5.7.2.

4.7.3 Automatic nozzles using fusible links

For each design, fusible heat-responsive elements in the lowest temperature rating shall demonstrate their ability to sustain the design load when tested in accordance with 5.7.3.