
Vgrajeni gasilni sistemi - Sistemi s pršečo vodo - 9. del: Protokol preskušanja sistemov z odprtimi šobami za požarno zaščito strojev v ohišjih do 260 m³

Fixed firefighting systems - Water mist systems - Part 9: Test protocol for machinery in enclosures not exceeding 260 m³ for open nozzle systems

Ortsfeste Brandbekämpfungsanlagen - Feinsprüh-Löschanlagen - Teil 9: Prüfprotokoll für Maschinen in Gehäusen bis 260 m³ für offene Düsensysteme

Installations fixes de lutte contre l'incendie - Systèmes à brouillard d'eau - Partie 9 : Protocole d'essai des systèmes à buses ouvertes pour machines situées dans des enceintes ne dépassant pas 260 m³ [SIST EN 14972-9:2020](https://standards.iteh.ai/catalog/standards/sist/51f49bdf-7073-4d2b-9746-8d58aff69d27/sist-en-14972-9-2020)

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Ta slovenski standard je istoveten z: EN 14972-9:2020

ICS:

13.220.10 Gašenje požara Fire-fighting

SIST EN 14972-9:2020 **en,fr,de**

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EUROPEAN STANDARD

EN 14972-9

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2020

ICS 13.220.20

English Version

Fixed firefighting systems - Water mist systems - Part 9: Test protocol for machinery in enclosures not exceeding 260 m³ for open nozzle systems

Installations fixes de lutte contre l'incendie - Systèmes
à brouillard d'eau - Partie 9 : Protocole d'essai des
systèmes à buses ouvertes pour machines situées dans
des enceintes ne dépassant pas 260 m³

Ortsfeste Brandbekämpfungsanlagen - Feinsprüh-
Löschanlagen - Teil 9: Prüfprotokoll für Maschinen in
Gehäusen bis 260 m³ für offene Düsensysteme

This European Standard was approved by CEN on 11 November 2019.

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European foreword

This document (EN 14972-9:2020) 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of an identical text or by endorsement, at the latest by July 2020 and conflicting national standards shall be withdrawn at the latest by July 2020.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.

EN 14972, *Fixed firefighting systems — Water mist systems* consists of the following parts:

- Part 1: *Design, installation, inspection and maintenance;*
- Part 2: *Test protocol for shopping areas for automatic nozzle systems;*
- Part 3: *Test protocol for office, school and hotel for automatic nozzle systems;*
- Part 4: *Test protocol for non-storage occupancies for automatic nozzle systems;*
- Part 5: *Test protocol for car garages for automatic nozzle systems;*
- Part 6: *Test protocol for false floors and false ceilings for automatic nozzle systems;*
- Part 7: *Test protocol for commercial low hazard occupancies for automatic nozzle systems;*
- Part 8: *Test protocol for machinery in enclosures exceeding 260 m³ for open nozzle systems;*
- Part 9: *Test protocol for machinery in enclosures not exceeding 260 m³ for open nozzle systems;*
- Part 10: *Test protocol for atrium protection with sidewall nozzles for open nozzle systems;*
- Part 11: *Test protocol for cable tunnels for open nozzle systems;*
- Part 12: *Test protocol for commercial deep fat cooking fryers for open nozzle systems;*
- Part 13: *Test protocol for wet benches and other similar processing equipment for open nozzle systems;*
- Part 14: *Test protocol for combustion turbines in enclosures exceeding 260 m³ for open nozzle systems;*
- Part 15: *Test protocol for combustion turbines in enclosures not exceeding 260 m³ for open nozzle systems;*
- Part 16: *Test protocol for industrial oil cookers for open nozzle systems;*
- Part 17: *Test protocol for residential occupancies for automatic nozzle systems.*

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.

EN 14972-9:2020 (E)

1 Scope

This document specifies fire testing requirements for water mist systems used for fire protection of machinery in enclosures with volumes not exceeding 260 m³.

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 14972-1:—¹⁾, *Fixed firefighting systems — Water mist systems — Part 1: Design, installation, inspection and maintenance*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 14972-1¹⁾ and the following apply.

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

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

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

3.1 machinery enclosure

<water mist systems>

any enclosure containing equipment that uses fuel and/or lubrication fluids with volatilities less than or equal to heptane

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4 General requirements

4.1 The water mist system, operating without manual intervention, shall successfully complete all described performance fire tests for their specific applications.

4.2 The fire tests shall be conducted until the fire is extinguished, as required by the applicable fire test.

4.3 System components, component locations, operating conditions and test enclosure details shall remain unaltered throughout all of the fire tests for a given application.

4.4 All fire tests shall be conducted using the specifications from the manufacturer's DIOM manual in regard to nozzle placement, spray flux, and spray duration. Sprays can be continuous or intermittent in time. In the case of intermittent, or cycled, sprays, the time period during which the system is not discharging shall not be greater than 50 % of one complete on/off cycle. The system off period shall not exceed one minute.

4.5 In conjunction with the performance fire tests, all twin fluid water mist systems (except for those applying compressed air) shall be subjected to a straight discharge test with no fire to evaluate the resulting discharge and oxygen concentration. This evaluation shall be conducted using the maximum extinguishing agent flow and pressure. The discharge duration for the test shall be the maximum

1) Under preparation. Stage at the time of publication: prEN 14972-1:2019.

required for the system and occupancy to be protected. Oxygen measurements shall be recorded at a location(s) within the test enclosure. This information shall be used to evaluate personnel safety, and shall be accounted for in the manufacturer's DIOM manual.

4.6 Up to a maximum of 5 nozzles used in the fire tests shall be kept for later verification.

5 Test enclosure requirements

The test enclosure volume shall have main dimensions of 7,30 m by 7,30 m by 4,90 m high. The enclosure shall be constructed of wood or metal frame with an inner lining of minimum 13,00 mm gypsum or 0,70 mm galvanized steel (see Figure 1). To minimize leakages, all joints and gaps shall be sealed. At 2,70 m from one of the enclosure corners, in one of the walls parallel to the machinery equipment mock-up, a 0,80 m by 2,00 m high personnel door shall be installed with a locking mechanism.

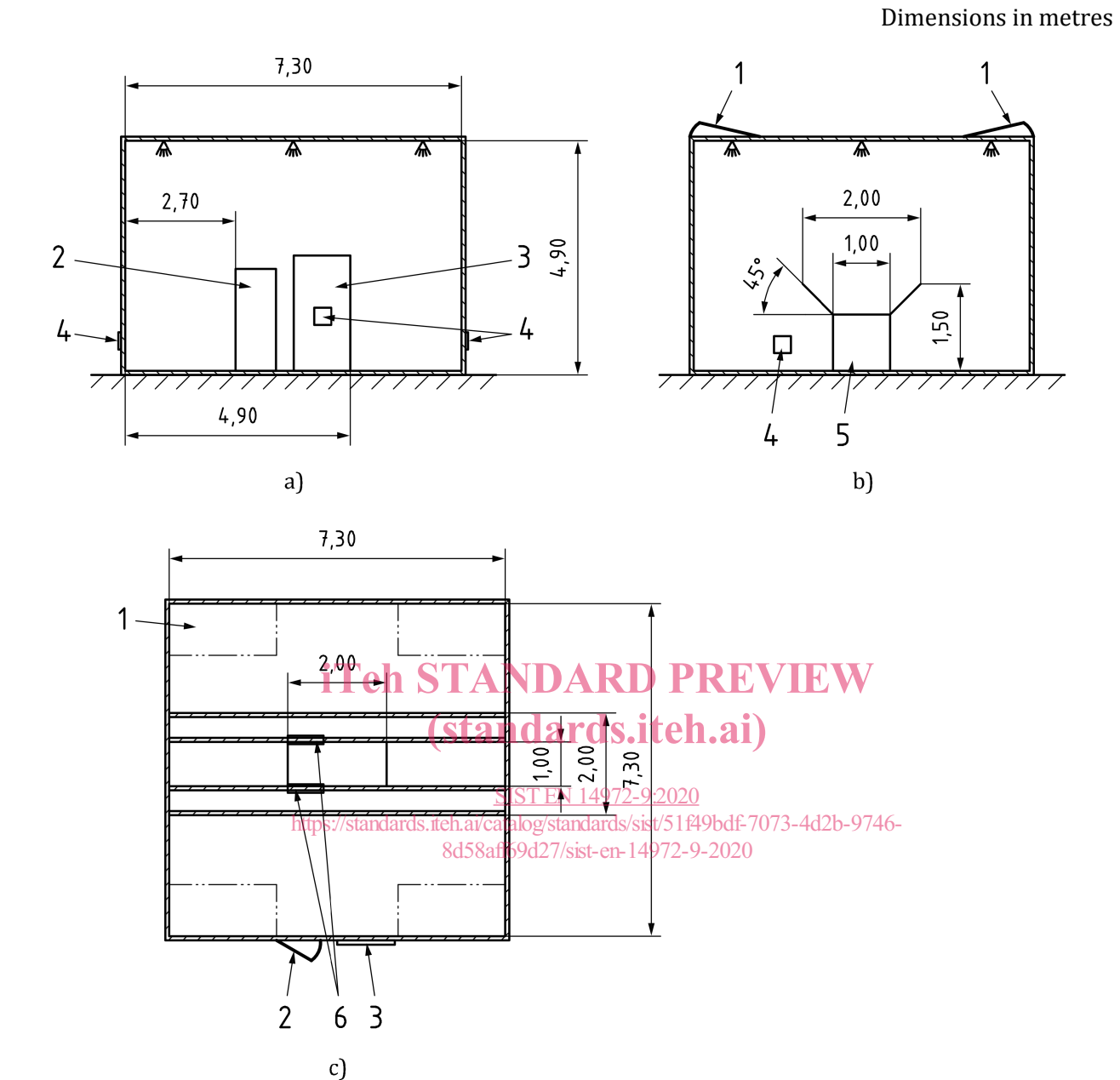
A 1,20 m by 2,40 m high removable panel shall also be installed in one of the walls to allow for test enclosure access (The personnel door can be constructed within this panel). A minimum of two hinged ceiling hatches measuring approximately 0,90 m by 1,80 m shall be installed in opposite diagonal corners for heat and smoke release at the conclusion of the fire test.

The floor shall be non-combustible and any floor drainage or vent openings shall be sealed during testing. A small louvered vent can be provided to allow the intake of air, to prevent excessive suctioning of the walls and ceiling and maintain structural integrity of the fire test enclosure.

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Key

a)	front view	3	removable panel (1,2 m x 2,4 m)
b)	side view	4	window
c)	top view	5	tray
1	ceiling hatch (typical)	6	sheet metal
2	door (0,8 m x 2,0 m)		

Figure 1 — Test enclosure and machinery mock-up steel plate

6 Machinery mock-up requirement

The machinery mock-up is simulated with a horizontal flat steel plate and steel baffles to provide shielded spaces for fires (see Figure 1). The specific details and thermal mass of the obstructions are not simulated.

The machinery mock-up unit should be centred along the longer wall dimension in the test enclosure.

A horizontal hot rolled 1.0044 steel plate according to EN 10025-2 or other equivalent steel, 1,00 m wide by 2,00 m long by 5,00 cm thick, is placed at 1 m elevation on steel legs at the four corners of the plate. This is located in the centre of the room or at a location within the test cell to be selected after the nozzles are installed (as per manufacturer's specifications). This allows the fire to be placed in an area considered the most challenging to the specific system being tested.

Horizontal 0,85 mm thick galvanized steel sheet metal shall be placed at an elevation of 1,00 m on steel legs, on both sides of the 1.0044 steel table, so that the machinery mock-up extends longitudinally the entire length of the enclosure (see Figure 1).

The underside curvature of the machinery is simulated with 0,85 mm thick galvanized sheet metal directed upward at an angle of 45 degrees on either side of the steel plate and horizontal sheet metal extension surface. These side pieces also extend longitudinally the entire length of the enclosure, rising to a height of 1,50 m above the horizontal sheet metal and steel plate surfaces. The total width of the mock-up is 2,00 m. There should be a minimal gap between the various steel table and sheet metal surfaces to permit water run-off.

The space below the plate is partially shielded from water mist using 1,00 m high by 0,50 m wide sheet metal baffles. The side baffles should be of 0,85 mm thick galvanized sheet metal construction and removable. They can be installed on support legs and kept in place by being pinched between the underside of the steel plate table and the 45 degree angle extensions and the floor for ease of removal. Placement of additional baffles or obstructions can be needed to prevent the direct impact of mist on the pool or spray test fires.

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7 Test equipment requirements

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7.1 The test laboratory shall be of adequate size with natural or minimal ventilation so as to not interfere with the fire testing within the enclosure or about the mock-up or test fuel package.

7.2 The size of the test laboratory shall not impact extinguishment of any test fires (i.e. depletion of oxygen due to an inadequately sized test laboratory).

7.3 For all fire tests accumulated water on the floor and on all flat surfaces shall be wiped out before the test.

7.4 The test enclosures or laboratory shall be at an ambient temperature of (20 ± 10) °C prior to the start of the test. The enclosure or hall shall be at as uniform an ambient temperature as reasonably possible. Localized hot or cold spots are not permitted. All non-fire induced drafts shall be eliminated.

7.5 The minimum operating nozzle pressure or pressure curve (as specified by the manufacturer) shall be used for all tests. System operating pressures shall be repeatable to within ± 5 %.

7.6 The maximum nozzle ceiling height and spacing (as specified by the manufacturer) shall be used for all tests. This includes utilizing the maximum ceiling spacing of the nozzles from the walls.

7.7 The discharge from water mist doorway nozzles, if used, are not permitted to discharge directly into the enclosure. The arrangement and discharge from the doorway water mist nozzles must not enhance the heat release rate or increase the fire intensity of any fire test arrangement.

7.8 Intermediate pendent or upright nozzles that are not at ceiling level, or wall mounted nozzles, are not permitted.