SLOVENSKI STANDARD
SIST EN 14972-3:2021

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Vgrajeni gasilni sistemi - Sistemi s pršečo vodo - 3. del: Protokol preskušanja sistemov z avtomatskimi šobami za požarno zaščito pisarn, šolskih učilnic in hotelov

Fixed firefighting systems - Water mist systems - Part 3: Test protocol for office, school classrooms and hotel for automatic nozzle systems

Ortsfeste Brandbekämpfungsanlagen - Feinsprüh-Löschanlagen - Teil 3: Prüfprotokoll für Büros, Schulen und Hotels für automatische Düsensysteme

Installations fixes de lutte contre l'incendie - Systèmes à brouillard d'eau - Partie 3 : Protocole d'essai des systèmes à buses automatiques pour bureaux, écoles et hôtels

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This European Standard was approved by CEN on 12 March 2021.

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European foreword

This document (EN 14972-3:2021) 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of an identical text or by endorsement, at the latest by February 2022, and conflicting national standards shall be withdrawn at the latest by February 2022.

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 class rooms 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*

NOTE This list includes standards that are in preparation and other standards may be added. For current status of published standards refer to www.cen.eu.

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.

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.

1 Scope

This document specifies the evaluation of the fire performance of water mist systems for offices, school classrooms and hotels. This fire test protocol is applicable to ceiling mounted automatic nozzles to be used in unlimited volume. This document is applicable for horizontal, solid, flat ceilings with heights of 2 m and above, up to the maximum tested ceiling height.

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 12845, *Fixed firefighting systems — Automatic sprinkler systems — Design, installation and maintenance*

EN 14972-1:2020, *Fixed firefighting systems — Water mist systems — Part 1: Design, installation, inspection and maintenance*

ISO 5660-1, *Reaction-to-fire tests — Heat release, smoke production and mass loss rate — Part 1: Heat release rate (cone calorimeter method) and smoke production rate (dynamic measurement)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 14972-1:2020 and the following apply.

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

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

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

3.1
office and school spaces
areas considered to be covered by the office and school fuel package in accordance with 5.2, including:

— cellular offices and open plan offices;

— areas with counters;

— restaurants and kitchens;

— public areas in buildings with low fire load;

— escape routes or other corridors;

— training classrooms;

— churches;

— museums;

— as well as further comparable risks.

3.2
hotel and accommodation spaces
areas considered to be covered by the hotel and accommodation spaces fuel package in accordance to 5.3, including:

— hotel rooms;

— rooms in hospitals, nursing homes, senior citizens residences;

— flats;

— recreation areas.

4 General requirements

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

4.2 The water mist system, operating without manual intervention, shall successfully complete all described performance fire tests for their specific applications. For the applications “office and school spaces” in accordance with 3.1, the fuel package in accordance with 5.2 shall be applied. For the applications “hotel and accommodation spaces” in accordance with 3.2, fuel packages in accordance with 5.3 shall be applied.

4.3 The fire load shall be taken from the conditioning area and arranged into the test area just before conducting the test.

4.4 For the “Office fuel package” in accordance with 5.2, the water flow shall be shut off 30 min after the activation of the first sprinkler/automatic nozzle in the fire test. Any remaining fire shall be manually extinguished and the fire damage shall be recorded.

4.5 For the “Hotel and Accommodation fuel package” in accordance with 5.3, the water flow shall be shut off 10 min after the activation of the first sprinkler/automatic nozzle in the fire test. Any remaining fire shall be manually extinguished and the fire damage shall be recorded.

4.6 Prior to the testing, a layout of the water mist system to be tested shall be submitted for test preparation purposes. This layout shall include any components required for the testing as well as the full dimensioning (e.g. length of pipes, distances of automatic nozzles/sprinklers, etc.).

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

4.8 All fire tests shall be conducted using the manufacturer instructions in regards to automatic nozzle placement, spray flux, and operating pressure. Sprays shall not be intermittent.

4.9 The test protocol is only applicable to ceiling mounted automatic nozzles.

4.10 The water supply shall be capable of supplying a flow rate and pressure at the minimum operating pressure and flow rate of the automatic nozzle as specified by the manufacturer. These parameters shall be met based on the actual layout of the pipework installation as used in the test scenario.

4.11 The tests with the water mist system shall be conducted at maximum ceiling height, maximum spacing and minimum discharge conditions regarding water flow and pressure as specified by the manufacturer for this application. The system shall be installed to achieve the maximum allowed time delay of water pressure build-up of the system.

5 Fuel packages

5.1 General

The test assembly for all fire tests shall comply with the following specifications and corresponding figures.

The reference testing with a prescribed sprinkler system serves to indicate the baseline performance at each different test facility and set-up. Within one test series, all fuel packages shall be identical.

The fire loads provided for the tests shall have humidity content as obtained by storage indoors at (20 ± 5) °C for two weeks.

In case of storing fire loads in conditioned environment at a temperature of (23 ± 2) °C and a relative humidity of (50 ± 5) %, conditioning time may be reduced to minimum of 48h.

The wood crib shall be conditioned before the test, such that the moisture content is (10 ± 2) %, 3 mm below the wood stick surface.

The storing conditions shall be the same for all fire loads used during all tests.

5.2 Office fuel package

5.2.1 General

The fuel package consists of the following elements:

— two table plates;

— a padded wooden-frame chair;

— a wooden drawer under one table;

— files and books on the table;

— plywood walls surrounding the tables;

— a gas burner and a wood crib for ignition.

The typical masses of the individual components shall be as listed in Table 1.

The tolerance of all dimensions is ± 5 %.

Table 1 — Office fire load

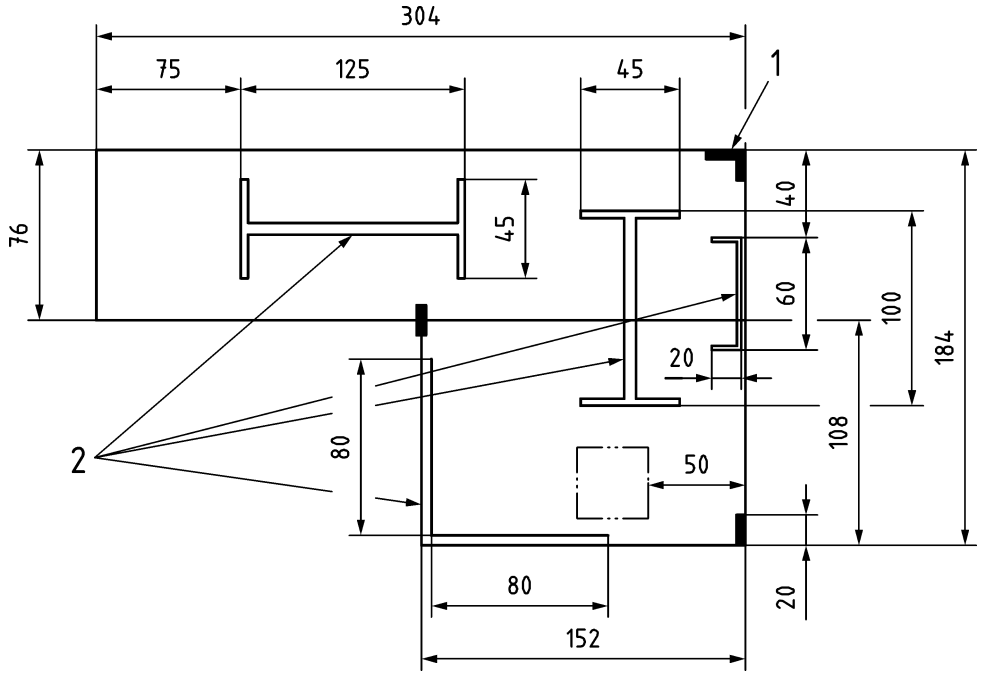
Combustible material	Item	Typical mass kg
Wood	Table plates	56
	Wall panel	30
	Drawer	15
	Chair (frame)	6
Paper	Filed paper	90
	Books	5
	Newspaper	1
Polyether foam	Chair (padding)	1
	Simulated files	1

A photograph of a typical fuel package is shown in Figure 1. Below, each element is described in more detail.

Figure 1 — Overview of the office fuel package

The tables shall be constructed out of two plain uncoated 22 mm thick chipboard plates, one with the measurements 304 cm × 76 cm × 76 cm and the other 152 cm × 108 cm × 76 cm, as given in Figure 2. Also shown in Figure 2 are the stands to which the table tops shall be attached by screws, and the position of the wooden drawer, which also serves to support the table tops.

Dimensions in centimetres



Key

1 wooden supports
2 metal frame

Figure 2 — Schematic presentation of the table construction

5.2.2 Padded chair

The padded wooden chair shall be constructed of a plain wooden chair by attaching a 40 cm × 100 cm piece of cotton-covered polyether foam mattress with screws and washers to it. The front edge of the chair shall be positioned flush with the edge of Table Nr. 1, and there shall be a 20 cm gap between the chair and Table Nr. 2.

The polyether foam shall be as follows:

The mattresses shall be made of non-fire retardant polyether and they shall have a density of approximately 33 kg/m^3. When tested in accordance with ISO 5660-1, the polyether foam shall give results as given in Table 2.

The cover shall fulfil the following requirements:

— material: non fire retardant cotton;

— surface weight: 140 g/m^2 to 180 g/m^2.