SLOVENSKI STANDARD
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Vgrajeni gasilni sistemi - Sistemi s pršečo vodo - 21. del: Protokol preskušanja elektronsko krmiljenih usmerjevalnih šob za stanovanjske prostore

Fixed firefighting systems – Water mist systems – Part 21: Test protocol for residential occupancies for electronically operated targeting nozzles

Ortsfeste Brandbekämpfungsanlagen – Wassernebelsysteme – Teil 21: Prüfprotokoll für Wohnbelegungen für elektronisch gesteuerte Zieldüsen

EN 14972-21 Installations fixes de lutte contre l'incendie – Systèmes à brouillard d'eau – Partie 21: Protocol d'essai des systèmes à les buses de ciblage à commande électronique pour locaux rèsidentiels

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Fixed firefighting systems - Water mist systems - Part 21: Test protocol for residential occupancies for electronically operated targeting nozzles

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Ortsfeste Brandbekämpfungsanlagen - Wassernebelsysteme - Teil 21: Prüfprotokoll für Wohnbelegungen für elektronisch gesteuerte Zieldüsen

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If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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Contents

Page

European foreword

This document (prEN 14972-21:2026) has been prepared by Technical Committee CEN/TC 191 “Fixed firefighting systems”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

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 manually activated 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;*

— *Part 18: Test protocol for local application involving flammable liquid fires for open nozzle systems;*

— *Part 19: Test protocol for areas with combustible flammable liquids for open nozzle systems;*

— *Part 20: Test protocol for data processing areas for automatic nozzle systems;*

— *Part 21: Test protocol for residential occupancies for electronically operated targeting nozzles.*

1 Scope

This document specifies fire testing requirements for water mist systems using wall mounted, electronically operated targeting nozzles for fire protection of domestic and residential occupancies up to a maximum ceiling height of 7,3 m.

EXAMPLE Examples for residential occupancies are family dwelling/house, bed and breakfast, apartment buildings, blocks of flats, care homes, small hotels or hostels, and residential areas in hotel bedrooms and guest corridors.

NOTE Some countries can have a national annex with guidance on the maximum height of the building, minimum design area and any additional requirements.

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 520:2004+A1:2009, *Gypsum plasterboards — Definitions, requirements and test methods*

EN 14972-1:2020+A1:2025, *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)*

UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*

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
electronically operated targeting nozzle
nozzle utilizing one or more sensors to determine whether there is a fire and its location and discharges water mist only at the direction of the fire

4 General requirements

4.1 General

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

A system which utilizes electronically operated targeting nozzles relies on an algorithm to read data from sensors integral to the fire suppression system to determine the probability and location of a fire. Only once the nozzle has pointed at the seat of the fire is the water discharged from the nozzle. The fire tests in this test protocol include a corner fire test, and also tests the potential failure modes of a horizontal targeted discharge, such as its interaction with an oil pan fire and the risk of a travelling fire overcoming the targeted discharge.

The system can be either a wet or dry pipe water mist system. For a dry pipe system the discharge delay of an installed system shall be considered, as detailed in Clause 7.

The nozzles shall be wall mounted, electronically operated targeting nozzles.

Wall mounted nozzles shall have their height specified below the ceiling or above the floor in accordance with the installation instructions.

4.2 Fire test categories

Fire tests are specified in Clause 7.

Room testing shall be carried out for all nozzle systems with the following fuel packages:

a) Fuel package A: Fabricated sofa, 5 tests;

b) Fuel package B: Corner fire, 6 tests;

c) Fuel package C: Cooking oil, 2 tests.

The fire test that shall be carried out for each fuel package is specified in Table 1. For four of the fire tests the fuel package is determined by the test results of previous tests in Table 1.

Table 1 — Fire test series

Test No.	Fuel package	Location of fire in regards to the nozzle	Nozzle obstructed?	Room size
1	Fabricated sofa with combustible wall (A)	Far wall – see Figure 9	No	Small
2	Fabricated sofa with combustible wall (A)	Near wall – see Figure 9	No	Small
3	Fabricated sofa with combustible wall (A)	Near wall – see Figure 10	No	Small
4	Corner fire (B)	Far corner – see Figure 11	No	Small
5	Corner fire (B)	Near corner – see Figure 11	No	Small
6	Same as Test No. 4 with drapes in lieu of plywood walls (B)	Far corner – see Figure 12	No	Small
7	Same as Test No. 5 with drapes in lieu of plywood walls (B)	Near corner – see Figure 12	No	Small
8	Cooking oil (C)	Near wall – see Figure 13	No	Small
9	Cooking oil (C)	Far wall – see Figure 13	No	Small
10	Fire considered to be closest to failure from Test No. 1 to Test No. 7	Far wall or corner – obstruction near nozzle	Yes	Small
11	Fire considered to be closest to failure from Test No. 1 to Test No. 7	Near wall of corner – obstruction near nozzle	Yes	Small
12	Fire considered to be closest to failure from Test No. 1 to Test No. 7	Far wall or corner – obstruction near fuel package	Yes	Small

Test No.	Fuel package	Location of fire in regards to the nozzle	Nozzle obstructed?	Room size
13	Fire considered to be closest to failure from Test No. 1 to Test No. 7	Near wall or corner – obstruction near fuel package	Yes	Small
14	Fabricated sofa with combustible wall (A)	See Figure 14	No	Large
15	Corner fire (B)	See Figure 15	No	Large
16	Fabricated sofa with combustible wall (A)	See Figure 16	Yes	Large
17	Corner fire (B)	See Figure 17	Yes	Large

5 Fuel packages

5.1 Ignition packages

5.1.1 Ignition package for fuel package A

The ignition package consists of a nominal 75 mm diameter, 152 m long cellulosic bundle, wrapped in a polyethylene bag with 118 ml of gasoline. The ignition package shall be centrally located 254 mm away from the leading edge of the couch, and positioned on a fire brick (see Figure 4).

5.1.2 Ignition package for fuel package B

The ignition package consists of a square tray of internal dimensions 300 mm × 300 mm × 100 mm deep, made from 12-gauge steel containing 200 ml of commercial grade heptane floated on water of 25 mm minimum depth.

The fire source shall consist of a wood crib and simulated furniture. The wood crib shall be ignited with a pan of heptane and the simulated furniture shall be ignited with two 15 cm long by 6,4 mm diameter cotton wicks soaked in heptane.

The wood crib shall weigh (2,5 to 3,2) kg and shall be dimensioned 305 mm × 305 mm × 152 mm high. The crib shall consist of four alternate layers of four trade size 38 mm × 38 mm cross section kiln-dried spruce or fir lumber each 305 mm long. The alternate layers of the lumber shall be placed at right angles to the adjacent layers. The individual wood members in each layer shall be evenly spaced along the length of the previous layer of wood members and stapled.

After the wood crib is assembled, it shall be conditioned at a temperature of (104 ± 5) °C for not less than 24 h or more than 72 h. Following the conditioning, the crib shall be placed in a plastic bag and stored at room temperature for at least 4 h before being used in a test. The wood crib shall be placed on top of a nominal 300 mm × 300 mm × 100 mm high, 2,5 mm thick, steel test pan positioned on the floor near a corner of the test enclosure. The wood crib shall be positioned 50 mm from each wall.

5.2 Fuel packages

5.2.1 Fabricated sofa fuel package A

The fabricated sofa fuel package shall be constructed using a steel frame with two pieces of polyurethane foam as seat and back cushions and three polyester fibre loose-fill pillows (see Figure 1). A diagram of the steel frame and dimensions is given in Figure 2 and Figure 3. The steel frame shall consist of two pieces constructed of nominal 25 mm rectangular solid stock or hollow stock with a nominal wall

thickness of not less than 3 mm. The backrest frame shall be bolted at a 60° angle to the base frame as shown in Figure 3.

The seat cushion shall consist of a polyurethane foam having nominal dimensions 1 829 mm long by 660 mm deep by 203 mm thick. The back cushion shall consist of the same polyurethane foam with nominal dimensions 1 829 mm long by 610 mm deep by 203 mm thick. The back cushions shall be held in place by two metallic retention holders located on the top of backrest. The polyurethane foam pieces shall be pure polypropylene oxide polyol, polyether foam having a density of 27,4 kg/m^3 to 30,4 kg/m^3.

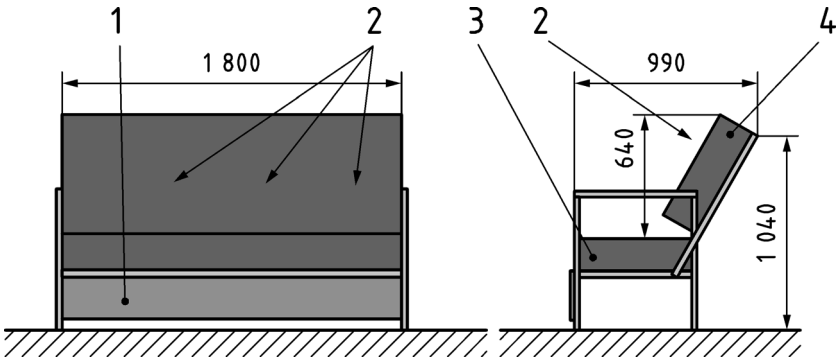
Each polyurethane foam piece shall be wrapped in a flat-black, 100 % polyester fibre fabric such that the top, bottom, and front of the foam slab is covered by a single layer of fabric. The front and sides of the foam may have overlapping fabric to ensure form-fitting coverage of the entire foam piece by the fabric. Steel safety pins shall be used to hold the fabric seams together. The fabric shall have a nominal area density of (225 to 259) g/m^2.

Three pillows shall be placed evenly and secured against the backrest of the simulated sofa using a thin gauge wire between the armrests of the sofa and across the front of the pillows. Each pillow shall consist of nominally 2,27 kg of 100 % polyester loose fibrefill held within a pouch of the same 100 % flat-black polyester fibre previously specified. The fabric pouch consists of two 762 mm × 1 016 mm rectangles of fabric held together around the edges by steel safety pins. The safety pins shall be spaced to not allow the loose fill to project outward. When filled with fibrefill, the pillows have dimensions of approximately 610 mm × 864 mm.

A 1 829 mm × 254 mm board of 6,4 mm plywood shall be bolted to the front legs of the frame to form a shield as shown in Figure 1. The bolt holes shall be as shown in Figure 2.

The right side of the sofa fuel package shall have an arm rest with dimensions and mounting as shown in Figure 4. The armrest shall consist of two sheets of 12,7 mm plywood with nominal dimensions 660 mm × 279 mm and 457 mm × 178 mm. Two nominal 457 mm wide strips of the flat-black 100 % polyester fabric shall be pulled around the armrest to form the cavity shown in Figure 4. Bricks or other means shall be used to hold the fabric taut. A piece of polyurethane foam measuring 457 mm long by 178 mm wide by 76 mm tall shall be located on top of the 457 mm by 178 mm sheet of plywood within the armrest cavity as shown in Figure 4.

Where used, the plywood material for the wall shall be as specified in 5.2.2.2.



Key

1 Plywood (250 mm by 1 800 mm)
2 Three nominal 600 mm by 800 mm
3 Cushion (203 mm by 610 mm)
4 Cushion (203 mm by 610 mm)

Figure 1 — Fabricated sofa frame and cushions