



Institut luxembourgeois de la normalisation  
de l'accréditation, de la sécurité et qualité  
des produits et services

## ILNAS-EN 14972-4:2024

### **Fixed firefighting systems - Water mist systems - Part 4: Test protocol for non- storage occupancies for automatic nozzle systems**

Installations fixes de lutte contre  
l'incendie - Systèmes à brouillard d'eau -  
Partie 4 : Protocole d'essai des systèmes  
à buses automatiques pour locaux non

Ortsfeste Brandbekämpfungsanlagen -  
Wassernebelsysteme - Teil 4:  
Prüfprotokoll für Nicht-Lager-  
Belegungen für automatische

04/2024



## National Foreword

This European Standard EN 14972-4:2024 was adopted as Luxembourgish Standard ILNAS-EN 14972-4:2024.

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**Fixed firefighting systems - Water mist systems - Part 4:  
Test protocol for non-storage occupancies for automatic  
nozzle systems**

Installations fixes de lutte contre l'incendie - Systèmes  
à brouillard d'eau - Partie 4 : Protocole d'essai des  
systèmes à buses automatiques pour locaux non  
destinés au stockage

Ortsfeste Brandbekämpfungsanlagen -  
Wassernebelsysteme - Teil 4: Prüfprotokoll für Nicht-  
Lager-Belegungen für automatische Düsensysteme

This European Standard was approved by CEN on 29 January 2024.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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

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## Contents

Page

European foreword.....	3
1 Scope .....	5
2 Normative references.....	5
3 Terms and definitions .....	5
4 General requirements .....	5
5 Test hall requirements.....	6
6 Test enclosure requirements.....	7
6.1 Small compartment .....	7
6.2 Large compartment.....	9
6.3 Open space.....	11
7 Fuel packages .....	11
7.1 Bunk beds .....	11
7.2 Corner crib and simulated furniture.....	12
7.3 Sofas .....	14
8 Instrumentation requirements.....	17
9 Fire test requirements .....	17
9.1 Small compartment with bunk beds .....	17
9.1.1 Criteria .....	17
9.1.2 Test Procedure .....	17
9.2 Large compartment with corner crib .....	18
9.2.1 Criteria .....	18
9.2.2 Test Procedure .....	18
9.3 Open space with sofas.....	18
9.3.1 General.....	18
9.3.2 Criteria .....	18
9.3.3 Test Procedure .....	18

## European foreword

This document (EN 14972-4:2024) 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 September 2024, and conflicting national standards shall be withdrawn at the latest by September 2024.

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.

The EN 14972 series, published under the general title *Fixed firefighting systems — Water mist systems*, consists of the following parts. This list includes standards that are in preparation, and other standards can be added. For the current status of published standards, refer to [www.cencenelec.eu](http://www.cencenelec.eu).

- *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 classrooms 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 m<sup>3</sup> for open nozzle systems;*
- *Part 9: Test protocol for machinery in enclosures not exceeding 260 m<sup>3</sup> 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 m<sup>3</sup> for open nozzle systems;*
- *Part 15: Test protocol for combustion turbines in enclosures not exceeding 260 m<sup>3</sup> 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.*

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, Türkiye and the United Kingdom.

## 1 Scope

This document specifies the evaluation of the fire performance of water mist systems for lightly loaded non-storage and non-manufacturing occupancies with ordinary combustibles, such as offices, schools, hospitals and hotels.

This document is applicable to ceiling mounted automatic nozzles to be used in restricted and/or unlimited areas.

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 636:2012+A1:2015, *Plywood — Specifications*

EN 13501-1:2018, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 14972-1, *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 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/>

## 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.

**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** All fire tests shall be conducted for 10 min after the activation of the first nozzle. After this 10 min period, any remaining fire shall be extinguished manually.

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

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

**4.7** The minimum operating nozzle pressure (as specified by the manufacturer) shall be used for all tests. System operating pressures shall be repeatable to within  $\pm 5\%$ . If the system pressures cannot be controlled within the specified tolerance, fire tests shall be conducted at the minimum and maximum pressure by using external means to control the system pressure.

**4.8** For all fire tests, the system shall be either:

- a) Pressurized to the minimum operating pressure specified by the manufacturer. Following activation of the first nozzle, the flowing water pressure shall be maintained at the minimum system operating pressure; or
- b) Pressurized to the minimum stand-by pressure specified by the manufacturer. Following activation of the first nozzle, the flowing water pressure shall be gradually increased to the minimum system operating pressure specified by the manufacturer. The delay time until the minimum system operating pressure is reached shall correspond to the delay time expected in an actual installation. The delay time recorded during the tests shall be documented and included in the system specifications.

**4.9** 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.

**4.10** The ceiling nozzle arrangement shall have uniform spacing. The ceiling nozzle spacing from the wall shall be uniform, preferably one half of the main spacing.

**4.11** The individual nozzles shall include either a fusible or glass bulb assembly and meet quick response nozzle criteria. The heat responsive element and temperature rating of the nozzles used in all fire tests shall be identical for evaluating the specific rating. The nominal operating temperature of the nozzle shall not exceed 107 °C.

**4.12** The fire test protocol may also be applied for evaluating multiple temperature ratings simultaneously by using nozzles having the highest nominal temperature rating for the open space tests, and a combination of nozzles having the lowest and highest nominal temperature ratings for the small and large compartment tests as described in the respective test procedures in Clause 9.

## **5 Test hall requirements**

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

**5.2** For the open space tests the test area shall include a ceiling of at least 80 m<sup>2</sup> in order to simulate an uninterrupted open space. There shall be a minimum gap of 1 m from the ceiling rim to the wall of the fire test hall, sufficient ventilation or space, to guarantee sufficient O<sub>2</sub> concentration over the entire test period.

**5.3** For all fire tests, the ceiling, floor, and walls shall be as dry as possible, with only the permissible moisture content of the environment. The relative humidity in the test enclosure shall not significantly differ from that of the ambient relative humidity of the environment. Maximum room relative humidity shall not be more than 70 % prior to the test.