



BSI Standards Publication

Fixed firefighting systems — Water mist systems

Part 15: Test protocol for combustion turbines in enclosures
not exceeding 260 m³ for open nozzle systems

National foreword

This British Standard is the UK implementation of EN 14972-15:2021.

The UK participation in its preparation was entrusted to Technical Committee FSH/18/5, Watermist systems.

A list of organizations represented on this committee can be obtained on request to its committee manager.

BSI, as a member of CEN, is obliged to publish EN 14972-15:2023 as a British Standard. However, attention is drawn to the fact that during the development of this European Standard, the UK committee advised against its approval.

It is the view of the UK committee that some of the requirements in EN 14972-15:2023, that are outside the scope of BS 8489-1, may be suboptimal to the recommendations in protocols that have been in use in the UK to date.

The UK committee also has a concern to the degree of reliance on the design, installation, operation and maintenance (DIOM) manual to constrain critical parameters with regard to the whole EN 14972 series of documents.

The UK committee believes that the standard does not sufficiently cover certain technical and safety matters. These have been addressed to some extent in National Annexes NA and NB.

The limits of application of the fire test protocols and other constraints have not, at the time of writing, been published. The intended scope and clear limits of the fire test protocols to the application of this standard are fundamental to its safe implementation. National Annexes NA and NB contain the UK committee recommendations (i.e. mechanisms to declare and constrain limits of application).

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Amendments/corrigenda issued since publication

Date	Text affected
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English Version

**Fixed firefighting systems - Water mist systems - Part 15:
Test protocol for combustion turbines in enclosures not
exceeding 260 m³ for open nozzle systems**

Installations fixes de lutte contre l'incendie - Systèmes
à brouillard d'eau - Partie 15 : Protocole d'essai des
systèmes à buses ouvertes pour turbines à combustion
situées dans des enceintes ne dépassant pas 260 m³

Ortsfeste Brandbekämpfungsanlagen -
Wassernebelsysteme - Teil 15: Prüfprotokoll für
Verbrennungsturbinen in Gehäusen bis 260 m³ für
offene Düsensysteme

This European Standard was approved by CEN on 2 August 2021.

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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 foreword

This document (EN 14972-15:2021) 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 March 2022, and conflicting national standards shall be withdrawn at the latest by March 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 fire testing requirements for water mist systems used for fire protection of combustion turbines 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 14972-1:2020, *Fixed firefighting systems — Water mist systems — Part 1: Design, installation, inspection and maintenance*

EN 10025-2, *Hot rolled products of structural steels — Part 2: Technical delivery conditions for non-alloy structural steels*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 14972-1:2020 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 <https://www.electropedia.org/>

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 (design, installation, operation and maintenance 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 1 min.

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 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 In addition to the fire tests, an optional spray cooling test may be conducted, and the results shall be analysed by heat transfer calculations to confirm that excessive turbine shell distortion is avoided. No direct spray impingement onto the turbine casing is allowed in real installations unless otherwise proven by the heat transfer calculations using the spray cooling test results.

4.7 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 7,3 m × 7,3 m × 4,9 m high (see Figure 1).

The enclosure shall be constructed of wood or metal frame with an inner lining of minimum 13 mm gypsum or 0,7 mm galvanized steel. 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 turbine equipment mock-up, a 0,8 m × 2,0 m high personnel door shall be installed with a locking mechanism.

A 1,2 m × 2,4 m high removable panel shall also be installed in one of the walls to allow for test enclosure access (the personnel door may be constructed within this panel). A minimum of two hinged ceiling hatches measuring approximately 0,9 m × 1,8 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.