

English Version

Fixed firefighting systems - Water mist systems - Part 5: Test protocol for car garages for automatic nozzle systems

Installations fixes de lutte contre l'incendie - Systèmes
à brouillard d'eau - Partie 5 : Protocole d'essai des
systèmes à buses automatiques pour garages
automobiles

Ortsfeste Brandbekämpfungsanlagen -
Wassernebelsysteme - Teil 5: Prüfprotokoll für Kfz-
Garagen für automatische Düsensysteme

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 191.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (prEN 14972-5:2023) 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 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 might be added. For current status of published standards refer to www.cenelec.eu.

1 Scope

This document specifies the evaluation of the fire performance of water mist systems for non-stacking garages, fully enclosed garages and underground garages.

This document is applicable for horizontal, solid, flat ceilings with heights of 2 m and above.

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 — Design, installation, inspection and maintenance*

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:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

car park garage

enclosed area intended for car park with horizontal, solid, flat ceilings with heights of 2 m and above

NOTE Automatic, stacking or non-fully enclosed are not covered by this definition.

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 water flow shall last for 30 min. Any remaining fire shall be manually extinguished and the fire damages shall be recorded.

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 should be conducted using the manufacturer instructions in regard to nozzle placement, spray flux, and spray duration. Sprays shall be continuous.

4.5 The test protocol is only applicable to ceiling mounted pendent and upright automatic nozzles.

4.6 The nozzles shall be located in accordance with the manufacturer's instructions.

4.7 Water mist sprinklers thermal sensitivity shall be special or standard response as specified in EN 12259-1.

4.8 The water supply shall be capable of supplying a flow rate and pressure according to the specific requirements, which are based on the actual layout of the pipework installation.

5 Car park garages fuel package

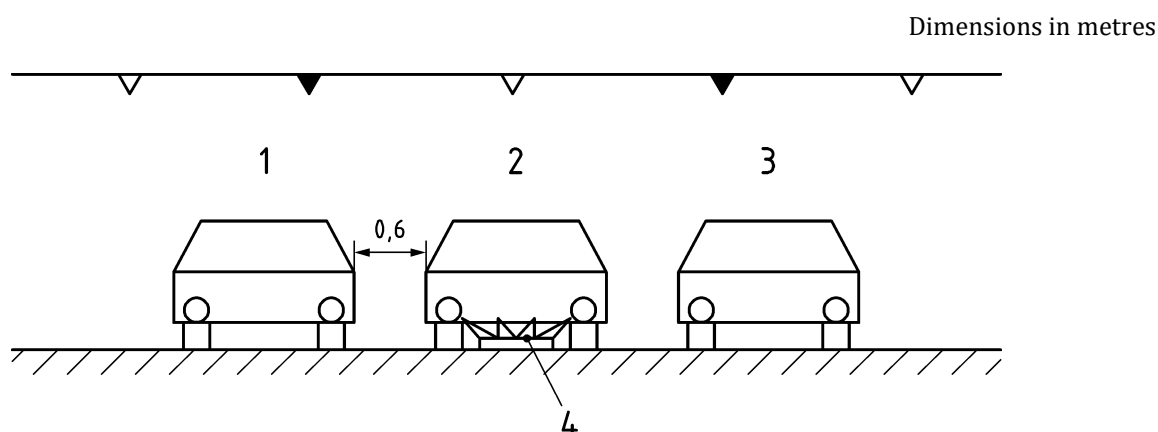
5.1 General

A relatively realistic car parking garages fuel package is employed in the test. As the fuel package is rather complex, the reference testing with a prescribed sprinkler system serves also to indicate the baseline performance at each different test facility and set-up. However, within one test series, the set of cars (selection of car 1, car 2, and car 3) shall be as identical as practicably possible for each test (i.e. make, type, number of doors), although car 1, car 2, and car 3 may differ from each other.

The test assembly to be provided for the tests shall comply with the following specifications and figures.

The test scenario is based on a car park garage, in which three vehicles are positioned as fire loads. Figure 1 shows the test assembly in accordance with the requirements specified in this Clause.

The cars to be provided for testing shall have normal humidity as is achieved by indoor storage at $(20 \pm 5) ^\circ\text{C}$.



Key

- 1 car 1 (Target)
- 2 car 2
- 3 car 3 (Target)
- 4 fire pan
- ▽ sprinkler layout: below a sprinkler
- ▼ sprinkler layout: between 4 sprinklers

Figure 1 — Assembly of fire loads and position of ignition source (side view)

5.2 Vehicles

Three vehicles of the same type of construction shall be provided for the test assembly. It is necessary to use comparable vehicles in all tests. Especially the following parts of the vehicles used in the tests shall be comparable:

- vehicle dimension and type of construction (notchbacks, hatchback, estate);
- position of exterior plastic parts (exterior mirrors, decorative trimming elements);
- indicators on the sides underneath the exterior mirrors;
- bumpers (material; coated/not coated);
- fixed roof without openings (e.g. sun roof);
- spare wheel in the boot;
- upholstery and floor mats on the inside of the passenger compartment.

The vehicles provided shall be complete and undamaged. For safety reasons, all vehicles used in the test shall be prepared as follows prior to testing:

- all operating fluids, such as petrol or brake fluids, shall be discharged;
- the cap of the petrol tank shall be removed;
- the gas-filled shock absorbers in the boot lid shall be removed;
- airbags (where applicable) shall be removed;
- all tyres shall be depressurised (remove valve) and the vehicles shall be supported in order to ensure that the distance between the vehicle and the top of the floor remains the same during testing.

5.3 Conditioning of the fuel load

Ignition source shall be a fire pan, which shall be positioned under car 2 in accordance to Figure 2. The fire pan shall fulfil the following requirements:

- position: centrally (longitudinal and transverse axis) under car 2;
- material: steel;
- dimensions:
 - 1 pan: 600 mm × 1 800 mm × 100 mm (regular);
 - 2 pans: 600 mm × 900 mm × 100 mm (alternative);
- amount of heptane: 14 l heptane + 14 l water.