



SLOVENSKI STANDARD

oSIST prEN 14972-1:2017

01-september-2017

Vgrajeni gasilni sistemi - Sistemi s pršečo vodo - 1. del: Načrtovanje, vgradnja, pregled in vzdrževanje

Fixed firefighting systems - Water mist systems - Part 1: Design, installation, inspection and maintenance

Ortsfeste Brandbekämpfungsanlagen - Feinsprüh-Löschanlagen - Teil 1: Planung, Einbau, Inspektion und Wartung

Installations fixes de lutte contre l'incendie - Systèmes à brouillard d'eau - Partie 1 : Conception, installation, inspection et maintenance

Ta slovenski standard je istoveten z: prEN 14972-1

ICS:

13.220.10 Gašenje požara Fire-fighting

oSIST prEN 14972-1:2017 **en,fr,de**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 14972-1

June 2017

ICS 13.220.20

Will supersede CEN/TS 14972:2011

English Version

Fixed firefighting systems - Water mist systems - Part 1: Design, installation, inspection and maintenance

Installations fixes de lutte contre l'incendie - Systèmes
à brouillard d'eau - Partie 1 : Conception, installation,
inspection et maintenance

Ortsfeste Brandbekämpfungsanlagen - Feinsprüh-
Löschanlagen - Teil 1: Planung, Einbau, Inspektion und
Wartung

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COMITÉ EUROPÉEN DE NORMALISATION
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CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

This document (prEN 14972-1:2017) 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.

This document will supersede CEN/TS 14972:2011.

The former CEN/TS 14972:2011 was reviewed and replaced with this new European Standard.

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; ¹⁾
- Part 3: Test protocol for office, school class rooms and hotel for automatic nozzle systems; ¹⁾
- Part 4: Test protocol for non-storage occupancies for automatic nozzle systems; ¹⁾
- Part 5: Test protocol for car garages for automatic nozzle systems; ¹⁾
- Part 6: Test protocol for false floors and false ceilings for automatic nozzle systems; ¹⁾
- Part 7: Test protocol for commercial low hazard occupancies for automatic nozzle systems; ¹⁾
- Part 8: Test protocol for machinery in enclosures exceeding 260 m³ for open nozzle systems; ¹⁾
- Part 9: Test protocol for machinery in enclosures not exceeding 260 m³ for open nozzle systems; ¹⁾
- Part 10: Test protocol for atrium protection with sidewall nozzles for open nozzle systems; ¹⁾
- Part 11: Test protocol for cable tunnels for open nozzle systems; ¹⁾
- Part 12: Test protocol for commercial deep fat cooking fryers for open nozzle systems; ¹⁾
- Part 13: Test protocol for wet benches and other similar processing equipment for open nozzle systems; ¹⁾
- Part 14: Test protocol for combustion turbines in enclosures exceeding 260 m³ for open nozzle systems; ¹⁾
- Part 15: Test protocol for combustion turbines in enclosures not exceeding 260 m³ for open nozzle systems; ¹⁾
- Part 16: Test protocol for industrial oil cookers for open nozzle systems; ¹⁾
- Part 17: Test protocol for residential occupancies for automatic nozzle systems. ¹⁾

¹⁾ With status of February 2017 in preparation.

1 Scope

This European Standard specifies requirements and gives recommendations for the design, installation, inspection and maintenance of fixed land based water mist systems.

This document is intended to apply to water mist automatic nozzle systems and water mist deluge systems supplied by stand alone or pumped systems.

Aspects of water mist associated with explosion protection are not covered by this European Standard.

This standard does not cover all legislative requirements. In certain countries specific national regulations apply and take precedence over this European Standard. Users of this European Standard are advised to inform themselves of the applicability or non-applicability for this European Standard by their national responsible authorities.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 54 (all parts), *Fire detection and fire alarm systems*

EN 12094-1, *Fixed firefighting systems - Components for gas extinguishing systems - Part 1: Requirements and test methods for electrical automatic control and delay devices*

EN 12094-4, *Fixed firefighting systems - Components for gas extinguishing systems - Part 4: Requirements and test methods for container valve assemblies and their actuators*

EN 12094-8, *Fixed firefighting systems - Components for gas extinguishing systems - Part 8: Requirements and test methods for connectors*

EN 12094-10, *Fixed firefighting systems - Components for gas extinguishing systems - Part 10: Requirements and test methods for pressure gauges and pressure switches*

EN 12094-13, *Fixed firefighting systems - Components for gas extinguishing systems - Part 13: Requirements and test methods for check valves and non-return valves*

prEN 12259-8, *Fire protection — Components for automatic sprinkler systems — Part 8: Pressure switches*

FprEN 12259-12, *Fixed firefighting systems — Components for sprinkler and water spray systems — Part 12: Pumps*

EN 12845:2015, *Fixed firefighting systems - Automatic sprinkler systems - Design, installation and maintenance*

prEN 14972 (all parts)², *Fixed firefighting systems - Water mist systems*

prEN 15004-1:2016, *Fixed firefighting systems — Gas extinguishing systems — Part 1: Design, installation and maintenance (ISO 14520-1:2015, modified)*

² In preparation.

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EN 50342 (all parts), *Lead-acid starter batteries — General requirements, methods of test and numbering*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

EN 60623, *Secondary cells and batteries containing alkaline or other non-acid electrolytes - Vented nickel-cadmium prismatic rechargeable single cells (IEC 60623)*

ISO 3046-1, *Reciprocating internal combustion engines — Performance — Part 1: Declarations of power, fuel and lubricating oil consumptions, and test methods — Additional requirements for engines for general use*

3 Terms, definitions and abbreviations**3.1 Terms and definitions**

For the purposes of this document, the following terms and definitions apply.

3.1.1**additive**

chemical or mixture of chemicals, intentionally introduced into the water mist system

Note 1 to entry: The additive can have one or more of the following purposes:

- enhancement of, or compliance with, fire protection requirements;
- corrosion protection;
- frost protection.
- automatic nozzle Systems

3.1.2**automatic nozzle water mist system
water mist sprinkler system**

water mist system with activation based on individual nozzle that operates when it reaches a specified activation temperature

Note 1 to entry: According to status of the pipework the automatic nozzle water mist systems are differentiated in:

- a) wet pipe systems;
- b) dry pipe systems; and
- c) pre-action systems.

3.1.3**atomizing gas**

compressed air or other gas used to produce water mist by mixing with the water

3.1.4**control valves**

valve intended for the control of a complete water mist system or sections of it

3.1.5**competent person**

person with the necessary training and experience, with access to the relevant tools, equipment and information, manuals and knowledge of any special procedures recommended by the manufacturer, to be capable of carrying out the relevant procedures for water mist systems

3.1.6**deluge water mist systems**

water mist system with activation based on the simultaneous discharge from all the predetermined nozzles included in one system section that operates when a fire detection and fire alarm system actuates the discharge valve controlling the flow to that system section

Note 1 to entry: According to the application characteristics the deluge water mist systems are differentiated in:

- local application systems;
- volume protection systems; and
- zoned protection systems.

3.1.7**design pressure**

maximum working pressure expected to be applied to a system component

Note 1 to entry: The design pressure is an important parameter for the determination of the strength of components.

3.1.8**discharge duration**

time interval between the first appearance of extinguishing agent at the nozzle and the time at which the discharge becomes predominantly gaseous or ceases

Note 1 to entry: The discharge time is expressed in seconds.

3.1.9**dry pipe system**

water mist system using automatic nozzles attached to a piping system containing air or inert gas under pressure, the release of which allows the water to flow

Note 1 to entry: The release for example from an opening of an automatic nozzle.

Note 2 to entry: The water flows into the piping system and out through any activated nozzles.

3.1.10**fire control**

limitation of fire growth and structural damages

EXAMPLE For example by cooling of the objects, adjacent gases or by pre-wetting adjacent combustibles or a combination of these three.

3.1.11**fire extinguishment**

complete elimination of any flaming or smouldering fire

3.1.12**firefighting medium**

substance which causes fire extinguishment, suppression or control

Note 1 to entry: Media for use in water mist systems: demineralized water, potable and sweet industrial water and water with additives are relevant. The terminology includes the following:

- a) water only, i.e. potable water, natural sea water, deionized water;
- b) water with antifreeze;

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- c) water with fire extinguishing enhancing additive;
- d) combination of a), b) and c) with an inert gas or a blend of inert gases used primarily to atomize the water or to reduce oxygen concentration or both at the fire.

3.1.13**fire suppression**

sharp reduction in the heat release rate and prevention of re-growth of the fire during system operation

3.1.14**free-burn test**

fire test without activation of the water mist system

3.1.15**flash-over prevention**

reducing the average temperature inside the protected volume to a temperature where the smoke layer with combustion products do not ignite

3.1.16**inspection**

<water mist systems> examination of an installation or their design and determination of its conformity with specific requirements or, on the basis of professional judgment, with general requirements

[SOURCE: EN ISO/IEC 17020:2012, 07, definition 3.1, modified]

3.1.17**installer**

organization or part of an organization delivering one or more services related to the planning, design, installation or maintenance of a water mist system to a client

Note 1 to entry: EN 16763 is using the term service provider.

[SOURCE: EN 16763:2017-01, definition 2.8, modified]

3.1.18**local application system**

system designed to protect a particular object or hazard

[SOURCE: EN 12416-1:2001+A2:2007, definition 3.10, modified]

3.1.19**maintenance**

combination of all technical, administrative actions, including supervision actions, intended to retain an item in, or restore it to, a state in which it can perform a required function

[SOURCE: EN 13306:2010, definition 2.1, modified]

3.1.20**manufacturer's design, installation, operation and maintenance manual****DIOM manual**

document describing the design process and giving details on the installation, operation and maintenance

Note 1 to entry: It is issued by the manufacturer for specific application, based on the results of fire tests.

3.1.21**manual means of escape**

provided means for the simultaneous presence of many people in one compartment to travel from any point in a building to a place of safety

EXAMPLE Theatres, hospitals or high-rise buildings.

3.1.22**operating area**

maximum area over which it is assumed, for design purposes, that a water mist system using automatic nozzles will operate in a fire

3.1.23**operating pressure**

constant or time-dependent pressure at a nozzle during discharge

3.1.24**preaction water mist system**

dry pipe water mist system, in which an independent fire detection and fire alarm system in the protected area allows the firefighting medium to flow into the pipework prior to the independent operation and subsequent operation of any automatic nozzle

3.1.25**preburn time**

time from ignition of the fire source till the operating pressure or design flow is available at the hydraulically most remote nozzle

3.1.26**propellant gas**

compressed gas used as a prime mover of push water out of storage vessels or containers, through pipe network or through distribution components

3.1.27**pump set**

<water mist systems> pumping unit made of one or more pumps, one or more motors or engines and one control panel (controller) governing the operation

3.1.28**qualified company**

organization fully trained and experienced for the design, installation and maintenance of fixed water mist systems

3.1.29**self-contained water mist system**

water mist system which include water as well as atomizing/propellant media containers, with or without control, pressure reducing and actuating valves

3.1.30**user**

person responsible for use and maintenance of the water mist system

prEN 14972-1:2017 (E)**3.1.31****water mist**

spray of water for which the diameter measured in a plane one meter from the nozzle at its minimum operating pressure is less than one millimetre

Note 1 to entry: Symbol for the diameter is $D_{v0,90}$.

3.1.32**water mist system**

entire means of a firefighting system connected to a water supply equipped with one or more nozzles capable of delivering water mist to meet the requirements of this document

Note 1 to entry: Water mist systems can discharge plain water mist or a mixture of water mist and some other agent or agents like gases or additives.

3.1.33**water mist system duration**

total time for which the supply of firefighting medium is designed to last

Note 1 to entry: The time is given in minutes.

Note 2 to entry: For systems with intermittent discharge it is the sum of the times of discharge and the times without discharge.

3.1.34**water mist system with additives**

water mist system containing substances other than those normally present in fresh water

3.1.35**wet pipe water mist system**

water mist system using automatic nozzles attached to a piping system containing water and connected to a water supply so that water discharges immediately from nozzles operated by the heat from a fire

3.1.36**zoned activation**

water mist system designed to protect hazards in a predetermined portion of an area

3.2 Abbreviations

For the purposes of this document, the following abbreviations apply.

DIOM manual design, installation, operation and maintenance manual

NPSH net positive suction head

4 Design**4.1 Design principal****4.1.1 General**

Water mist systems shall be designed for the specific hazard or occupancy or both as defined in the fire test protocols.

4.1.2 Qualification

Water mist systems shall only be designed, installed and maintained by qualified companies.

4.1.3 Testing procedures

Water mist systems shall be tested in accordance with testing protocols of the EN 14972 series³. For scenarios where test protocols listed in EN 14972 series⁴ are not applicable, it is recommended to test water mist systems in accordance with the guidelines given in Annex A.

4.1.4 Delay of activation

No time delay for activation is needed.

4.1.5 Material reaction

Water mist systems shall not be used in those cases where the application of water can cause additional hazards.

4.1.6 Real scale testing

The safe use of a water mist system is limited to applications it has been tested for. Parameters used during such tests define the limits of its application, unless scaling of the results is part of the testing.

4.2 Manufacturer manual

4.2.1 General

There shall be a design, installation, operation and maintenance manual for each water mist system. They shall be combined in a single document as design, installation, operation and maintenance manual (DIOM manual).

4.2.2 Manufacturer's responsibility

It is the Manufacturer's responsibility to develop the design, installation and maintenance manual of specific water mist systems against the fire tests used to determine the performance of the system and the installation parameters.

4.2.3 Content of the DIOM manual

The manufacturer shall prepare a relevant detailed manual to provide a specification of the system. This manual shall include at least the following:

- system identification, type and hazard application with any restrictions,
- all design parameters;
 - nozzle type and unique identification;
 - number of operating nozzles or operating area;
 - additives (if used);
 - design pressure (if a pumped system is used);

³ In preparation.

⁴ In preparation.