

ICS 13.220.20

English Version

Fixed firefighting systems - Water spray systems - Design, installation and maintenance

Installations fixes de lutte contre l'incendie - Systèmes
d'extinction à pulvérisation d'eau - Conception, installation
et maintenance

Ortsfeste Brandbekämpfungsanlagen -
Sprühwasserlöschanlagen - Planung, Einbau und Wartung

This Technical Specification (CEN/TS) was approved by CEN on 9 September 2008 for provisional application.

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Foreword

This document (CEN/TS 14816:2008) has been prepared by Technical Committee CEN/TC 191 “Fixed firefighting systems”, the secretariat of which is held by BSI.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

It is included in a series of European standards planned to cover:

- automatic sprinkler systems (EN 12259, EN 12845),
- gas extinguishing systems (EN 12094),
- powder systems (EN 12416),
- explosion protection systems (EN 26184),
- foam systems (EN 13565),
- hydrant and hose reel systems (EN 671),
- smoke and heat control systems (EN 12101).

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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Introduction

Water spray systems can be suitable, in some instances, for extinguishment of fire and in others for prevention of fire spread, and may be independent of or supplementary to other forms of fire protection.

A water spray system consists of a water supply (or supplies) and one or more sprayers usually open; each system consists of a control valve set and a pipe array fitted with sprayers.

The design of specific systems may vary considerably, depending on the nature of the hazard and the basic purposes of protection. Because of these variations and the wide choice in the characteristics of sprayers, it is assumed that these systems are competently designed, installed and maintained. It is essential that their limitations as well as their capabilities be thoroughly understood by the designer.

It should not be assumed that the provision of a water spray system entirely obviates the need for other means of fighting fires and it is important to consider the fire precautions in the premises as a whole. Special measurement may also be required, for example bounding flammable liquid risks or the protection drain of flammable liquids spillage.

Structural fire resistance, escape routes, fire alarm systems, particular hazards needing other fire protection methods, provision of hose reels, fire hydrants and fire extinguishers, etc., safe working and goods handling methods, management supervision and good housekeeping all need consideration.

It is essential that water spray systems should be properly maintained to ensure operation when required. This routine is liable to be overlooked or given insufficient attention by supervisors. It is, however, neglected at peril to the lives of occupants of the premises and at the risk of crippling financial loss. The importance of proper maintenance cannot be too highly emphasized.

When water spray systems are out of service, extra attention should be paid to fire precautions and the appropriate authorities informed.

This standard is intended for use by those concerned with purchasing, designing, installing, testing, inspecting, approving, operating and maintaining water spray systems, in order that such equipment will function as intended throughout its life.

It is a basic assumption that this standard is for the use of companies employing personnel competent in the field of application with which it deals. The design, installation and maintenance of water spray systems should be undertaken only by trained and experienced personnel. Similarly, competent technicians should be used in the installation and testing of the equipment.

1 Scope

This Technical Specification specifies requirements and gives recommendations for the design, installation and maintenance of fixed deluge water spray systems internal and external to buildings and industrial plant and other premises on land. This Technical Specification covers only the use of the types of sprinklers and sprayers specified in EN 12259-1. The requirements and recommendations of this Technical Specification are also applicable to any addition, extension, repair or other modification to a water spray system. This Technical Specification does not deal with sprinkler systems.

It covers the hazards, provision of water supplies, components to be used, installation and testing of the system, maintenance, and the extension of existing systems, and identifies construction details of buildings which are necessary for the satisfactory performance of water spray systems complying with this Technical Specification.

The general principles may well apply to other uses (e.g. maritime use), for these other uses additional considerations will almost certainly have to be taken into account.

For water spray systems covered by this Technical Specification the authority shall be consulted.

2 Normative references

The following referenced documents are indispensable for the application 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 54-1, *Fire detection and fire alarm systems – Part 1: Introduction*

EN 54-2, *Fire detection and fire alarm systems – Part 2: Control and indicating equipment*

EN 54-3, *Fire detection and fire alarm systems – Part 3: Fire alarm devices – Sounders*

EN 54-4, *Fire detection and fire alarm systems – Part 4: Power supply equipment*

EN 54-5, *Fire detection and fire alarm systems – Part 5: Heat detectors – Point detectors*

EN 54-10, *Fire detection and fire alarm systems – Part 10: Flame detectors – Point detectors*

EN 54-11, *Fire detection and fire alarm systems – Part 11: Manual call points*

EN 12094 (all parts), *Fixed firefighting systems - Components for gas extinguishing systems*

EN 12259-1, *Fixed firefighting systems – Components for sprinkler and water spray systems – Part 1: Sprinklers*

EN 12259-2, *Fixed firefighting systems – Components for sprinkler and water spray systems – Part 2: Wet alarm valve assemblies*

EN 12259-3, *Fixed firefighting systems – Components for automatic sprinkler and water spray systems – Part 3: Dry alarm valve assemblies*

prEN 12259-9, *Fixed firefighting systems – Components for sprinkler and water spray systems – Part 9: Deluge valve assemblies*

EN 12845:2004, *Fixed firefighting systems – Automatic sprinkler systems – Design, installation and maintenance*

3 Terms and definitions

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

3.1 authorities

organizations responsible for approving water spray systems, equipment and procedures, e.g. the fire and building control authorities, the fire insurers, the local water authority or other appropriate public authorities

3.2 control valve set

assembly comprising an alarm valve, a stop valve and all the associated valves and accessories for the control of one water spray installation

3.3 deluge valve

water supply control valve intended to be operated by an auxiliary means to admit water into a system of piping with open sprayers

NOTE The auxiliary means of operating a deluge valve may be mechanical, electrical, hydraulic, pneumatic, thermal, manual or a combination of these.

3.4 deluge installation

part of a water spray system comprising a control valve set, the associated downstream pipes and sprayers, and the means of release

3.5 design density

minimum density of discharge, in mm/min of water, for which a water spray installation is designed, determined from the discharge of a specified group of sprayers, in litres per minute, divided by the area covered, in square metres

3.6 detector sprinkler

sealed sprinkler mounted on a pressurized pipeline used to control a deluge valve, such that operation of the detector sprinkler causes loss of air, inert gas or water pressure to open the valve

3.7 distribution pipe

pipe feeding either a range pipe directly or a single sprayer on a non-terminal range pipe more than 300 mm long

3.8 exposure protection

application of water spray to structures or equipment to limit absorption of heat to a level which will minimize damage and prevent failure, whether the source of heat is external or internal

NOTE Exposure protection is not an extinguishing system.

3.9 fire resisting compartment

enclosed volume capable of maintaining its fire integrity for a minimum specified time

3.10 fully calculated

term applied to an installation in which all the pipe work is sized by hydraulic calculation

3.11

impingement

striking of a protected surface by water droplets issuing directly from a sprayer

3.12

multiple control

automatic multiple control: a pipe line valve, with a thermally sensitive sealing device which opens to discharge water for fire fighting

3.13

multiple control installation

part of a water spray system comprising a multiple control, the associated downstream pipes and sprayers

3.14

run-down

downward travel of water along a surface

3.15

slippage

the horizontal component of the travel of water along a surface beyond the point of impact

3.16

sprayer

water spray nozzle that gives a pre-determined pattern of discharge

3.17

sprinkler, open

sprinkler not sealed by a temperature sensitive element

3.19

water spray installations

deluge installation or a multiple control installation

3.21

water spray systems

the entire means of providing water spray protection in the premises comprising one or more deluge installations or multiple control installations, the pipe work to the installations and the water supply/supplies

3.22

zone

area protected by one water spray installation

4 Operating condition of water spray systems

4.1 Operation in the open air

Consideration shall be given to the effects of wind on water spray protection. The selection of sprayers, their position relative to the burning materials and sprayer spacings will vary depending on the anticipated conditions. Where extreme conditions may be experienced, it may be necessary to provide structural protection to reduce the influence of wind.

4.2 Fire resisting compartments

A fire occurring in an area not protected by an automatic fire fighting system which is in open communication with an area protected by a water spray system may render the protection ineffective, unless the protected area is in a fire resisting compartment in accordance with national regulations with a minimum of 60 min fire resistance.