

# SVENSK STANDARD

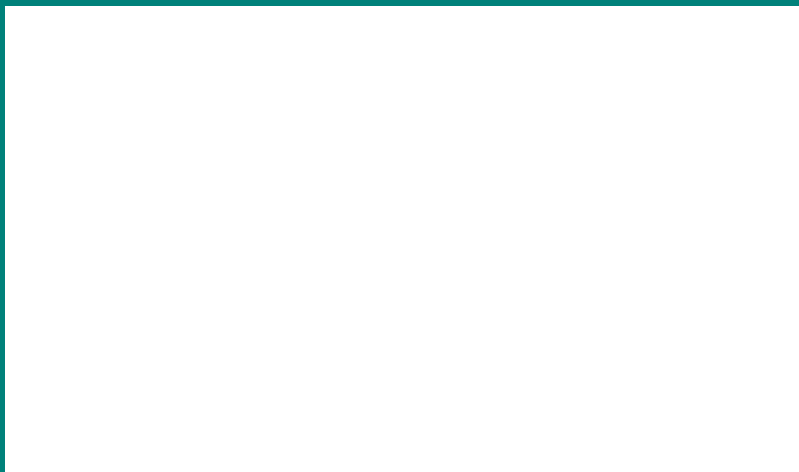
## SS 883001:2009/INSTA 900-1

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### **Brand och räddning – Boendesprinkler – Utförande, installation och underhåll**

### **Residential sprinkler systems – Design, installation and maintenance**



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## Foreword

This INSTA standard has been prepared by a committee representing the Inter Nordic Standardisation Cooperation, named *INSTA 900 Residential sprinklers systems*, the secretariat of which is held by Standards Norway.

This INSTA 900-1 standard shall be given the status of a national standard in Denmark, Norway and Sweden either by publication of an identical text or by endorsement, at the latest by February 2010.

INSTA 900 consists of the following parts, under the general title *Residential sprinkler systems*.

- Part 1: Design, installation and maintenance
- Part 2: Requirements and test methods for sprinklers and their accompanying rosettes (under development).

## Introduction

An automatic residential sprinkler system is designed to detect a fire and control it with water in its early stages or hold the fire in check so that evacuation can be completed safely. The residential sprinkler system will also hold the fire in check so that the possibility of extinguishment by other means will increase.

A residential sprinkler system consists of a water supply, a control valve and a pipe array fitted with sprinkler heads. The sprinkler heads are fitted at specified locations at the roof, ceiling or walls.

The sprinklers operate at predetermined temperatures to discharge water over the affected part of the area below. The flow of water initiates an alarm signal in order to draw attention to the operating of the system. The operating temperature is generally selected to suit ambient temperature conditions.

Only sprinklers in the vicinity of the fire, i.e. those which become sufficiently heated, operate.

The residential sprinkler system is intended to extend throughout the premises with only limited exceptions.

It should not be assumed that the provision of a residential sprinkler system entirely obviates the need for other means of detecting and fighting fires and it is important to consider the fire precautions in the occupancy as a whole.

Structural fire resistance, escape routes, smoke alarms, fire alarm systems, provision of portable fire extinguishers, training and information all need consideration. National legislation shall always be fulfilled and will normally cover the need of other fire precautions in addition to the residential sprinkler systems.

It is essential that residential sprinkler systems should be properly maintained to ensure operation when required. This routine is liable to be overlooked or given insufficient attention. 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 residential sprinkler systems are out of service extra attention should be paid to fire precautions and the residents informed.

**SS 883001:2009 (E)****1 Scope**

This standard specifies requirements and gives recommendations for the design, installation and maintenance of fixed residential fire sprinkler systems in buildings, or part of buildings, which contains typical residential occupancies.

Areas within buildings that contains hazard other than those which typically would be found in a residential occupancy are not covered by this standard.

Typical residential areas are:

- private homes (one and two family dwellings, row houses, vacation homes etc.);
- apartments, flats;
- manufactured homes.

Dwelling units and the escape routes from those areas for building types such as:

- care institutions (nursing homes, hospitals etc.);
- in hotels, motels etc.;
- student housing, dormitories;
- asylum centres.

The requirements and recommendations of this standard are also applicable to any addition, extension, repair or other modification to the residential sprinkler system.

It covers 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 the minimum necessary for satisfactory performance of residential sprinkler systems complying with this standard.

The standard is not intended to restrict new technologies or alternative arrangements, provided that an equivalent level of safety is assured.

Forms of secure accommodations such as correctional or rehabilitation facilities are not covered by this standard.

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

This standard is intended only for fixed residential fire sprinkler systems in buildings on land, and 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. Only trained and experienced personnel should undertake the design, installation and maintenance of residential sprinkler systems. Similarly, competent technicians should be used in the inspection and testing of the system.

This standard does not necessarily cover all legislative requirements.



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

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

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

EN 54-21, *Fire detection and fire alarm systems – Part 21: Alarm transmission and fault warning routing equipment*

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 sprinkler and water spray systems – Part 3: Dry alarm valve assemblies*

EN 12259-5, *Fixed firefighting systems – Components for sprinkler and water spray systems – Part 5: Water flow detectors*

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

EN 12723, *Liquid pumps – General terms for pumps and installations – Definitions, quantities, letter symbols and units*

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

EN 50342, *Lead-acid starter batteries – General requirements, methods of test and numbering*

EN 60529, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

EN 60623, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Vented nickel-cadmium prismatic rechargeable single cells (IEC 60623:2001)*

EN 60947-1, *Low-voltage switchgear and controlgear – Part 1: General rules (IEC 60947-1:1999, modified)*

EN 60947-4, *Low-voltage switchgear and controlgear – Contactors and motor-starters; Electromechanical contactors and motor-starters (IEC 60947-4-1:2000)*

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

ISO 3046-3, *Reciprocating internal combustion engines – Part 3: Test measurements*

ISO 3046-4, *Reciprocating internal combustion engines – Part 4: Speed governing*

ISO 3046-5, *Reciprocating internal combustion engines – Part 5: Torsional vibrations*

ISO 3046-6, *Reciprocating internal combustion engines – Part 6: Overspeed protection*

IEC 60331-31, *Tests for electrical cables under fire conditions – Integrity – Part 31: Procedures and Requirements for Fire with Cables of Rated Voltage up to and Including 0,6/1 kV*

prINSTA 900-2 *Residential sprinkler systems – Part 2: Requirements and test methods for sprinklers and their accompanying rosettes*

**SS 883001:2009 (E)****3 Terms and definitions**

For the purposes of this document the definitions in EN 12845 are valid. For terms not used in EN 12845, the following definitions apply.

**3.1 actual area of coverage**  
As=S x D, Method: the actual area of coverage of a sprinkler equals “S” x “D” where “S” is the distance between sprinklers on the branch lines or twice the distance to the nearest obstruction in that direction. “D” is the distance between branch lines or twice the distance to the nearest obstruction in that direction

**3.2 alarm receiving centre**  
a permanently manned external center from which the necessary fire fighting measures can be initiated at any time

**3.3 authority**  
an organization or individual responsible for approving sprinkler systems, equipment and procedures, e.g. the fire and building control authorities, the fire insurers, the local water authority, other appropriate public authorities or the owner

**3.4 design area of coverage**  
the area in m<sup>2</sup> for the sprinkler according to the manufacturer’s specifications for which the sprinkler is being used

**3.5 design discharge**  
the total flow in litres per minute from the design sprinklers at the spacing for which they are being used

**3.6 design density**  
the minimum density of discharge, in millimetres per minute of water, for which a sprinkler installation is designed, determined from the discharge of a specified group of sprinklers, in litres per minute, divided by the area covered, in square metres

[EN 12845:2004]

**3.7 design sprinklers**  
adjacently located sprinklers within the same residential compartment having the greatest hydraulic demand. The design sprinklers are used to determine the hydraulic design of the sprinkler system

**3.8 dwelling**  
building that contains dwelling units intended to be used, rented, leased, let or hired out to be occupied for habitation purposes

**3.9 dwelling unit**  
the area in a building arranged for the purposes of habitation of one or more individuals containing sleeping, living, and normally cooking and sanitary facilities

**3.10 flat smooth ceiling**  
a continuous ceiling in a single plane, free from obstructions that could influence the discharge pattern of the sprinkler

**3.11****horizontal ceiling**

a ceiling with a slope not exceeding 8,5 degrees

**3.12****level**

as specified in national building codes

**3.13****local manned centre**

an internal or external centre where alarm and fault signals can be received and from which the necessary action can be taken

**3.14****manufacturer's specification**

a document published by a manufacturer which is accepted by the authorities and intended to supplement this standard with additional technical information with regards to design, installation and maintenance

**3.15****multipurpose piping system**

a piping system intended to serve both domestic and fire protection needs

**3.16****network system**

a type of multipurpose piping system, applicable for Type 1 buildings only, utilizing a common piping system supplying plumbing fixtures and fire sprinklers where each sprinkler is supplied by a minimum of three separate paths

**3.17****quick response extended coverage sprinkler**

a type of spray sprinkler with maximum coverage areas as specified in paragraph 7.2.4. The sprinkler may be of either upright, pendent or sidewall type. They have a quick response element as specified in EN 12259-1

**3.18****quick response spray sprinkler**

a spray sprinkler with a quick response element according EN12259-1, either upright, pendent or sidewall type

**3.19****quick response conventional sprinkler**

a conventional sprinkler with a quick response element according EN12259-1

**3.20****residential compartment**

a space completely enclosed by walls and a ceiling. Openings to an adjoining space are allowed, provided the openings have a minimum lintel depth of 210mm from the ceiling. The total width of openings in a single wall shall not exceed 2.4 m. A single opening of 900mm or less in width without a lintel is allowed when there are no other openings to adjoining spaces

**3.21****residential sprinkler**

a type of sprinkler having a thermal element with an RTI of 50 (meters-seconds)<sup>1/2</sup> or less that is specifically designed to enhance survivability in the room of fire origin and passed the tests according to prINSTA 900-2

**3.22****sloped ceiling**

a ceiling with a slope exceeding 8,5 degrees