

**Brand och räddning – Fasta släcksystem –
Komponenter för sprinkler- och vatten-
spraysystem –
Del 1: Sprinklerhuvuden**

**Fixed firefighting systems – Components
for sprinkler and water spray systems –
Part 1: Sprinklers**

Europastandarden EN 12259-1:1999+A1:2001 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 12259-1:1999+A1:2001.

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The European Standard EN 12259-1:1999+A1:2001 has the status of a Swedish Standard. This document contains the official English version of EN 12259-1:1999+A1:2001.

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Fixed firefighting systems - Components for sprinkler and water spray systems - Part 1: Sprinklers

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Ortsfeste Löschanlagen - Bauteile für Sprinkler- und Sprühwasseranlagen - Teil 1: Sprinkler

This European Standard was approved by CEN on 20 January 2001.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This European Standard EN 12259-1:1999 + A1:2001 has been prepared by Technical Committee CEN/TC 191 "Fixed firefighting systems", the secretariat of which is held by BSI.

This European Standard replaces EN 12259-1:1999.

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of an identical text or by endorsement, at the latest by December 2001, and conflicting national standards shall be withdrawn at the latest by March 2003.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

It forms one Part of EN 12259, covering components for automatic sprinkler systems and is included in a series of European Standards planned to cover:

- a) automatic sprinkler systems (EN 12259)¹
- b) Gaseous extinguishing systems (EN 12094) ¹
- c) powder systems (EN 12416) ¹
- d) explosion protection systems (EN 26 184)
- e) foam systems (EN 13565)
- f) hydrant and hose reel systems (EN 671)
- g) smoke and heat control systems (EN 12101) ¹
- h) water spray systems ¹

EN 12259 has the general title "Fixed fire fighting systems - Components for sprinkler and water spray systems" and will be subdivided as follows:

- Part 1: Sprinklers.
- Part 2: Wet alarm valve assemblies
- Part 3: Dry alarm valve assemblies
- Part 4: Water motor alarms.
- Part 5: Water flow detectors.
- Part 6: Pipe couplings.

¹ In preparation

- Part 7: Pipe hangers.
- Part 8: Pressure switches.
- Part 9 Deluge alarm valve assemblies.
- Part 10 Multiple controls.
- Part 11 Medium and high velocity water sprayers.
- Part 12 Sprinkler pump sets.

Where reference is made to the application of components having imperial dimensions it has been necessary to use imperial units where appropriate.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies requirements for construction and performance of sprinklers which are operated by a change of state of an element or bursting of a glass bulb under the influence of heat, for use in automatic sprinkler systems conforming to EN 12845 Automatic sprinkler systems : Design and installation. Test methods and a recommended test schedule for type approval testing are also given.

NOTE All pressure data in this European standard are given as gauge pressures in bar².

2 Normative references

This European standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

- ISO 7-1 - Pipe threads where pressure-tight joints are made on the threads - Part 1: Dimensions, tolerances and designation.
- ISO 49 - Malleable cast iron fittings threaded to ISO 7-1.
- ISO 65 - Carbon steel tubes suitable for screwing in accordance with ISO 7-1

²) bar = 10⁵ Pa

3 Terms and definitions

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

3.1

conductivity factor [C]

measure of the conductance between the sprinkler's heat responsive element and the water filled fitting, expressed in $(\text{meters/second})^{1/2} (\text{m/s})^{1/2}$.

3.2

response time index [RTI]

measure of the thermal sensitivity of the sprinkler expressed in $(\text{meters seconds})^{1/2} (\text{ms})^{1/2}$.

3.3

automatic sprinkler

nozzle with a thermally sensitive sealing device which opens to discharge water for fire fighting.

3.4

ceiling (or flush) pattern sprinkler

pendent sprinkler for fitting partly above, but with the temperature sensitive element below, the lower plane of the ceiling.

3.5

coated sprinkler

sprinkler with a coating applied for the purpose of reducing the effects of corrosive environments, excluding decorative paint or painted finishes.

3.6

concealed sprinkler

recessed sprinkler with a cover plate that disengages when heat is applied.

3.7

conventional pattern sprinkler

sprinkler which gives a spherical pattern of water discharge.

3.8

design lower tolerance limit (DLTL)

glass bulb supplier's specified and assured lowest lower tolerance limit (LTL).

3.9

design upper tolerance limit (DUTL)

sprinkler supplier's specified and assured highest upper tolerance limit (UTL).

3.10

dry pendent sprinkler

sprinkler and dry drop pipe with a valve, at the head of the pipe, held closed by a device maintained in position by the sprinkler head valve.

3.11

dry upright sprinkler

sprinkler and dry rise pipe with a valve, at the base of the pipe, held closed by a device maintained in position by the sprinkler head valve.

3.12

flat spray pattern sprinkler

sprinkler that is similar to a spray pattern sprinkler but with a pattern of water discharge with a proportion of the discharge directed above the level of the deflector.

3.13

fusible link sprinkler

sprinkler which opens when an element provided for that purpose melts.

3.14

glass bulb sprinkler

sprinkler which opens when a liquid-filled glass bulb bursts.

3.15

mean design service load

sprinkler supplier's specified and assured highest mean service load for any batch of 10 or more sprinklers.

3.16 mean design strength

glass bulb supplier's specified and assured lowest mean bulb strength for any batch of 55 or more bulbs.

3.17

pintle

metal extension rod extending from the deflector.

3.18

horizontal sprinkler

sprinkler in which the nozzle directs the water horizontally.

3.19

lower tolerance limit (LTL)

glass bulb lowest strength determined by test and statistical analysis of a batch of 55 or more bulbs.

3.20

pendent sprinkler

sprinkler in which the nozzle directs the water downwards.

3.21

recessed sprinkler

sprinkler in which all or part of the thermally sensitive element is above the plane of the ceiling.

3.22

sidewall pattern sprinkler

sprinkler that gives an outward half paraboloid pattern of water discharge.

3.23**spray pattern sprinkler**

sprinkler that gives a downward paraboloid pattern of water discharge.

3.24**supplier**

company responsible for the design, manufacture and quality assurance of a product

3.25**upper tolerance limit (UTL).**

highest service load determined by test and statistical analysis of a batch of 20 or more sprinklers.

3.26**upright sprinkler**

sprinkler in which the nozzle directs the water upwards.

3.27**sprinkler yoke (arms)**

part of a sprinkler that maintains the thermally sensitive element in load bearing contact with the sprinkler head valve.

4 Construction and performance**4.1 Product assembly**

Sprinklers shall only be assembled in such a way that adjustment or dismantling will result in destruction of an element of construction.

4.2 Dimensions

4.2.1 The nominal diameter of the orifice of the sprinklers and the corresponding thread size of the sprinklers, except dry and flush sprinklers, shall be suitable for use with pipe threads given in Table 1. Dry and flush sprinklers may have larger thread sizes. Nominal thread sizes shall be suitable for fittings threaded in accordance with ISO 7-1.

4.2.2 It shall be possible for a sphere of $8^{+0,01}_0$ mm diameter to pass through each water passage in the sprinkler.

Table 1 — Orifice and thread dimensions

Nominal diameter of orifice mm	Nominal pipe thread size inches
10	3/8
15 and 20	1/2
20	3/4

4.2.3 Sprinklers having a 20 mm nominal diameter orifice in combination with a ½ inch nominal thread size (normally used for retrofitting purposes), shall have a pintle, (10 ± 2) mm long and having a diameter of (5 ± 2) mm, permanently attached at the deflector for identification purposes.

4.3 Nominal operating temperature

4.3.1 The nominal operating temperatures of glass bulb sprinklers are given in Table 2 column 1.

4.3.2 The nominal operating temperature ranges of fusible link sprinklers are given in Table 2 column 3.

4.3.3 Glass bulb sprinklers and non-plated and non-coated fusible link sprinklers shall be colour coded according to the nominal operating temperature as given in Table 2, columns 2 or 4 as appropriate.

Table 2 — Nominal operating temperatures and colour codes

Glass bulb sprinklers		Fusible link sprinklers	
Column 1 Nominal operating temperature ° C	Column 2 Liquid colour code	Column 3 Nominal operating temperature within range ° C	Column 4 Yoke arms colour code
57	orange	57 to 77	uncoloured
68	red	80 to 107	white
79	yellow	121 to 149	blue
93	green	163 to 191	red
100	green	204 to 246	green
121	blue	260 to 302	orange
141	blue	320 to 343	black
163	mauve		
182	mauve		
204	black		
227	black		
260	black		
286	black		
343	black		

4.4 Operating temperatures

4.4.1 When tested in accordance with annex B, fusible link sprinklers shall operate at a temperature within the range:

$$[t \pm (0,035 t + 0,62)] \text{ } ^\circ\text{C}$$

where t is the nominal operating temperature.

4.4.2 When tested in accordance with annex B, glass bulbs and glass bulb sprinklers shall operate within the temperature range specified in Table 3.

Table 3 — Operating temperatures for glass bulbs and glass bulb sprinklers

Nominal operating temperature °C	Lowest operating temperature °C	Temperature at or below which at least		Highest operating temperature °C
		25 of the 50 specimens operate °C	40 of the 50 specimens operate °C	
57	54	63	68	74
68	65	74	79	86
79	76	87	92	99
93	90	101	106	113
100	97	108	113	120
121	118	129	134	141
141	138	149	155	163
163	160	171	177	186
182	179	190	196	206
204	201	212	218	228
227	224	235	242	252
260	257	268	275	286
286	283	294	301	313
343	340	351	359	372

4.5 Water flow and distribution

4.5.1 K-factor

The K-factor of the sprinklers shall be within the range given in Table 4, when determined in accordance with annex C.