



SLOVENSKI STANDARD
SIST EN 12845:2015+A2:2026

01-junij-2026

Vgrajene naprave za gašenje - Avtomatski sprinklerski sistemi - Projektiranje, vgradnja in vzdrževanje (vključno z dopnilom A2)

Fixed firefighting systems - Automatic sprinkler systems - Design, installation and maintenance

Ortsfeste Brandbekämpfungsanlagen - Automatische Sprinkleranlagen - Planung, Installation und Instandhaltung

Installations fixes de lutte contre l'incendie - Systèmes d'extinction automatique du type sprinkleur - Conception, installation et maintenance

Ta slovenski standard je istoveten z: EN 12845:2015+A2:2026

ICS:

13.220.10	Gašenje požara	Fire-fighting
13.220.20	Požarna zaščita	Fire protection

SIST EN 12845:2015+A2:2026 **en,fr,de**

Sample Document

get full document from standards.iteh.ai

EUROPEAN STANDARD

EN 12845:2015+A2

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2026

ICS 13.220.20

Supersedes EN 12845:2015+A1:2019

English Version

Fixed firefighting systems - Automatic sprinkler systems - Design, installation and maintenance

Installations fixes de lutte contre l'incendie - Systèmes
d'extinction automatique du type sprinkleur -
Conception, installation et maintenance

Ortsfeste Brandbekämpfungsanlagen - Automatische
Sprinkleranlagen - Planung, Installation und
Instandhaltung

This European Standard was approved by CEN on 2 October 2019 and includes Amendment 2 approved by CEN on 19 January 2026.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

© 2026 CEN All rights of exploitation in any form and by any means reserved
worldwide for CEN national Members.

Ref. No. EN 12845:2015+A2:2026 E

Contents	Page
European foreword.....	10
Introduction	12
1 Scope.....	14
2 Normative references.....	14
3 Terms and definitions	15
4 Contract planning and documentation.....	23
4.1 General.....	23
4.2 Initial considerations.....	23
4.3 Preliminary or estimating stage	23
4.4 Design stage	24
4.4.1 General.....	24
4.4.2 Summary schedule.....	24
4.4.3 Installation layout drawings	24
4.4.4 Water supply.....	27
5 Extent of sprinkler protection.....	29
5.1 Buildings and areas to be protected.....	29
5.1.1 General.....	29
5.1.2 Permitted exceptions within a building.....	29
5.1.3 Necessary exceptions.....	29
5.2 Storage in the open air	30
5.3 Fire resistant separation	30
5.4 Protection of concealed spaces	30
5.5 Height difference between the highest and lowest sprinklers.....	30
6 Classification of occupancies and fire hazards.....	30
6.1 General.....	30
6.2 Hazard classes	31
6.2.1 General.....	31
6.2.2 Light Hazard - LH	31
6.2.3 Ordinary Hazard - OH.....	31
6.2.4 High Hazard - HH	32
6.3 Storage	33
6.3.1 General.....	33
6.3.2 Storage Configuration.....	33
7 Hydraulic design criteria.....	35
7.1 LH, OH and HHP	35
7.2 High Hazard Storage - HHS.....	36
7.2.1 General.....	36
7.2.2 Ceiling or roof protection only	36
7.2.3 Intermediate level in-rack sprinklers	37
7.3 Pressure and flow requirements for pre-calculated systems.....	39
7.3.1 LH and OH systems	39
7.3.2 HHP and HHS systems without in-rack sprinklers.....	40
8 Water supplies	42

8.1	General	42
8.1.1	Duration	42
8.1.2	Continuity	42
8.1.3	Frost protection.....	42
8.2	Maximum water pressure.....	42
8.3	Connections for other services	43
8.4	Housing of equipment for water supplies	44
8.5	Test facility devices.....	44
8.5.1	General	44
8.5.2	At pump house	45
8.5.3	At control valve sets.....	45
8.6	Water supply test.....	45
8.6.1	General	45
8.6.2	Storage tank and pressure tank supplies	45
8.6.3	Town main, booster pump, elevated private reservoir and gravity tank supplies	46
9	Type of water supply	46
9.1	General	46
9.2	Town mains.....	46
9.3	Storage tanks.....	46
9.3.1	General	46
9.3.2	Water volume.....	47
9.3.3	Refill rates for full capacity tanks	48
9.3.4	Reduced capacity tanks	48
9.3.5	Effective capacity of tanks and dimensions of suction chambers	50
9.3.6	Strainers.....	51
9.4	Inexhaustible sources – settling and suction chambers	51
9.5	Pressure tanks	54
9.5.1	General	54
9.5.2	Housing.....	54
9.5.3	Minimum capacity (water).....	54
9.5.4	Air pressure and contents	54
9.5.5	Charging with air and water	55
9.5.6	Control and safety equipment.....	55
9.6	Choice of water supply.....	55
9.6.1	Single water supplies	55
9.6.2	Superior single water supplies	56
9.6.3	Duplicate water supplies	56
9.6.4	Combined water supplies	56
9.7	Isolation of water supply	57
10	Pumps A_2 and pump sets A_2	57
10.1	General	57
10.2	Multiple pump A_2 set A_2 arrangements	57
10.3	Compartments for pump sets.....	57
10.3.1	General	57
10.3.2	Sprinkler protection.....	58
10.3.3	Temperature	58
10.3.4	Ventilation.....	58
10.4	Maximum temperature of water supply	58
10.5	Valves and accessories.....	58
10.6	Suction conditions.....	59
10.6.1	General	59
10.6.2	Suction pipe A_2 of pump set A_2	59

EN 12845:2015+A2:2026 (E)

10.7	Performance characteristics ^{A2} of pump sets ^{A2}	62
10.7.1	Pre-calculated systems – LH and OH	62
10.7.2	Pre-calculated systems – HHP and HHS with no in-rack sprinklers	63
10.7.3	Calculated systems	63
10.7.4	Pressure and water capacity of boosted town mains	63
10.7.5	Pressure switches	63
10.8	Electrically driven pump sets	64
10.8.1	General	64
10.8.2	Electricity supply	64
10.8.3	Main switchboard	65
10.8.4	Installation between the main switchboard and the ^{A2} electrical pump set ^{A2}	65
^{A2}	deleted text ^{A2}	65
10.8.5	Monitoring of pump ^{A2} set ^{A2} operation	65
10.9	Diesel engine driven pump sets	65
10.9.1	General	65
10.9.2	Starter alarm indication	66
10.9.3	^{A2} Site commissioning test ^{A2}	66
11	Installation type and size	66
11.1	Wet pipe installations	66
11.1.1	General	66
11.1.2	Protection against freezing	66
11.1.3	Size of installations	67
11.2	Dry pipe installations	67
11.2.1	General	67
11.2.2	Size of installations	67
11.3	Alternate installations	68
11.3.1	General	68
11.3.2	Size of installations	68
11.4	Pre-action installations	68
11.4.1	General	68
11.4.2	Automatic detection system	69
11.4.3	Size of installations	69
11.5	Subsidiary dry pipe or alternate extension	69
11.5.1	General	69
11.5.2	Size of subsidiary extensions	69
11.6	Subsidiary water spray extension	69
12	Spacing and location of sprinklers	70
12.1	General	70
12.2	Maximum area of coverage per sprinkler	70
12.3	Minimum distance between sprinklers	72
12.4	Location of sprinklers in relation to building construction	72
12.5	Intermediate sprinklers in HH occupancies	78
12.5.1	General	78
12.5.2	Maximum vertical distance between sprinklers at intermediate levels	78
12.5.3	Horizontal position of sprinklers at intermediate levels	78
12.5.4	Numbers of rows of sprinklers at each level	80
12.5.5	HHS intermediate sprinklers in non-shelved racks	80
12.5.6	HHS intermediate sprinklers below solid or slatted shelves in racks (ST5 and ST6)	81
13	Pipe sizing and layout	82
13.1	General	82
13.2	Calculation of pressure losses in pipework	82
13.2.1	Pipe friction loss	82

13.2.2	Static pressure difference.....	83
13.2.3	Velocity.....	83
13.2.4	Pressure loss through fittings and valves.....	83
13.2.5	Accuracy of calculations.....	84
13.3	Pre-calculated systems.....	85
13.3.1	General.....	85
13.3.2	Location of Design Points.....	85
13.3.3	Light Hazard - LH.....	86
13.3.4	Ordinary Hazard - OH.....	88
13.3.5	High hazard - HHP and HHS (except intermediate level sprinklers).....	89
13.4	Fully calculated systems.....	98
13.4.1	Design density.....	98
13.4.2	Locations of the area of operation.....	99
13.4.3	Shape of the area of operation.....	99
13.4.4	Minimum sprinkler discharge pressure.....	102
13.4.5	Minimum pipe diameters.....	102
14	Sprinkler design characteristics and uses.....	103
14.1	General.....	103
14.2	Sprinkler types and application.....	103
14.2.1	General.....	103
14.2.2	Ceiling, flush, recessed and concealed pattern.....	104
14.2.3	Sidewall pattern.....	104
14.2.4	Flat spray pattern.....	104
14.3	Flow from sprinklers.....	104
14.4	Sprinkler temperature ratings.....	105
14.5	Sprinkler thermal sensitivity.....	106
14.5.1	General.....	106
14.5.2	Interaction with other measures.....	106
14.6	Sprinkler guards.....	106
14.7	Sprinkler water shields.....	106
14.8	Sprinkler rosettes.....	107
14.9	Corrosion protection of sprinklers.....	107
15	Valves.....	107
15.1	Control valve set.....	107
15.2	Stop valves.....	107
15.3	Ring main valves.....	107
15.4	Drain valves.....	107
15.5	Test valves.....	108
15.5.1	Alarm and pump A_2 set A_2 start test valves.....	108
15.5.2	Remote test valves.....	109
15.6	Flushing connections.....	109
15.7	Pressure gauges.....	109
15.7.1	General.....	109
15.7.2	Water supply connections.....	109
15.7.3	Control valve set.....	109
15.7.4	Removal.....	110
16	Alarms and alarm devices.....	110
16.1	Water flow alarms.....	110
16.1.1	General.....	110
16.1.2	Water motor and gong.....	110
16.1.3	Piping to water motor.....	110
16.2	Electrical water flow and pressure switches.....	110

EN 12845:2015+A2:2026 (E)

16.2.1	General.....	110
16.2.2	Water flow alarm switches.....	110
16.2.3	Dry and pre-action systems.....	111
16.3	Fire brigade and remote central station alarm connection.....	111
17	Pipework.....	111
17.1	General.....	111
17.1.1	Underground piping.....	111
17.1.2	Above ground piping.....	111
17.1.3	Welding of steel pipe.....	111
17.1.4	Flexible pipes and joints.....	112
17.1.5	Concealment.....	112
17.1.6	Protection against fire and mechanical damage.....	112
17.1.7	Painting.....	112
17.1.8	Drainage.....	112
17.1.9	Copper pipe.....	113
17.2	Pipe supports.....	113
17.2.1	General.....	113
17.2.2	Spacing and location.....	113
17.2.3	Design.....	114
17.3	Pipework in concealed spaces.....	114
17.3.1	General.....	114
17.3.2	False ceilings above OH occupancies.....	114
17.3.3	All other cases.....	115
18	Signs, notices, and information.....	115
18.1	Block plan.....	115
18.2	Signs and notices.....	115
18.2.1	Location plate.....	115
18.2.2	Signs for stop valves.....	115
18.2.3	Control valve set.....	115
18.2.4	Water supply connections to other services.....	116
18.2.5	Suction and booster pumps.....	116
18.2.6	Electric switches and control panels.....	116
18.2.7	Testing and operating devices.....	117
19	Commissioning.....	117
19.1	Commissioning tests.....	117
19.1.1	Pipework.....	117
19.1.2	Equipment.....	117
19.1.3	Water supplies.....	117
19.2	Completion certificate and documents.....	118
20	Maintenance.....	118
20.1	General.....	118
20.1.1	Introduction.....	118
20.1.2	Programmed work.....	118
20.1.3	Precautions while carrying out work.....	118
20.1.4	Replacement sprinklers.....	118
20.2	User's programme of inspection and checking.....	119
20.2.1	General.....	119
20.2.2	Weekly routine.....	119
20.2.3	Monthly routine.....	120
20.3	Service, testing and maintenance schedule.....	120
20.3.1	General.....	120

20.3.2	Quarterly routine.....	120
20.3.3	Half-yearly routine.....	121
20.3.4	Yearly routine	121
20.3.5	3 Yearly routine.....	122
20.3.6	10 yearly routine	122
21	Ⓐ Periodic system inspection.....	123
Annex A (normative) Classification of typical hazards.....		124
Annex B (normative) Methodology for categorizing stored goods.....		127
B.1	General	127
B.2	Material factor (M)	127
B.2.1	General	127
B.2.2	Material Factor 1.....	127
B.2.3	Material factor 2.....	128
B.2.4	Material factor 3.....	128
B.2.5	Material factor 4.....	129
B.3	Storage configuration.....	129
B.3.1	Effect of storage configuration.....	129
B.3.2	Exposed plastic container with non-combustible content	130
B.3.3	Exposed plastic surface – unexpanded	130
B.3.4	Exposed plastic surface – expanded.....	130
B.3.5	Open structure.....	130
B.3.6	Solid block materials.....	131
B.3.7	Granular or powdered materials.....	131
B.3.8	No special configuration	131
Annex C (normative) Alphabetical listing of stored products and categories.....		132
Annex D (normative) Zoning of sprinkler installations		136
D.1	General	136
D.2	Zoning of installations	136
D.3	Requirements for zoned installations.....	136
D.3.1	Extent of zones.....	136
D.3.2	Zone subsidiary stop valves.....	136
D.3.3	Flushing Valves.....	136
D.3.4	Monitoring.....	136
D.3.5	Zone test and drainage facilities	137
D.3.6	Installation control valve set.....	137
D.3.7	Installation monitoring and alarms.....	137
D.4	Block plan	137
Annex E (normative) Special requirements for high rise systems		139

EN 12845:2015+A2:2026 (E)

E.1	General	139
E.2	Design criteria	139
E.2.1	Hazard group	139
E.2.2	Subdivision of high rise sprinkler systems	139
E.2.3	Standing water pressures at non-return and alarm valves	139
E.2.4	Calculation of distribution pipework for pre-calculated systems	139
E.2.5	Water pressures	139
E.3	Water supplies	140
E.3.1	Types of water supplies	140
E.3.2	Pressure and flow requirements for pre-calculated installations	140
E.3.3	Water supply characteristics for pre-calculated installations	140
E.3.4	Pump \square_{A2} set \square_{A2} performance for pre-calculated installations	140
Annex F (normative) Additional measures to improve system reliability and availability		143
F.1	General	143
F.2	Subdivision into zones	143
F.3	Wet pipe installations	143
F.4	Sprinkler type and sensitivity	143
F.5	Control valve set	143
F.6	Water supplies	143
F.7	Additional measures for theatres	143
F.8	Additional precautions for maintenance	144
Annex G (normative) Protection of special hazards		145
G.1	General	145
G.2	Aerosols	145
G.3	Clothes in multiple garment hanging storage	145
G.3.1	General	145
G.3.2	Categorization	146
G.3.3	Sprinkler protection other than at ceiling	146
G.3.4	Sprinklers in operation	146
G.3.5	Ceiling sprinklers	146
G.3.6	Automatic shutdown	146
G.3.7	Control valve set	147
G.4	Flammable liquid storage	147
G.5	Idle pallets	149
G.6	Spirit based liquors in wooden barrels	150
G.7	Non-woven synthetic fabric	150

G.7.1	Free standing storage	150
G.7.2	Rack storage	151
G.8	Polypropylene or polyethylene storage bins	151
G.8.1	General	151
G.8.2	Classification	151
G.8.3	Palletized rack storage (ST4)	151
G.8.4	All other storage	151
G.8.5	Foam additive	152
Annex H	(normative) Sprinkler systems monitoring	153
H.1	General	153
H.2	Functions to be monitored	153
H.2.1	General	153
H.2.2	Stop valves controlling water flow to sprinklers	153
H.2.3	Other stop valves	153
H.2.4	Liquid levels	153
H.2.5	Pressures	153
H.2.6	Electrical power	154
H.2.7	Temperature	154
Annex I	(normative) Transmission of alarms	155
I.1	Functions to be monitored	155
I.2	Alarm levels	156
Annex J	(informative) Precautions and procedures when a system is not fully operational	157
J.1	Minimizing the effects	157
J.2	Planned shut-down	157
J.3	Unplanned shut-down	158
J.4	Action following sprinkler operation	158
J.4.1	General	158
J.4.2	Installations protecting cold storage warehouses (air circulation refrigeration)	158
Annex K	(informative) Twenty-five year inspection	159
Annex L	(informative) Special technology	160
Annex M	(informative) Independent certification body	161
Annex N	(normative) Control Mode Specific Application Sprinklers: CMSA	162
Annex O	(informative) Example of P&ID	163
Annex P	(normative) ESFR sprinkler protection	164
Annex Q	(informative) A1 Periodic system inspection	165
	Bibliography	166

EN 12845:2015+A2:2026 (E)**European foreword**

This document (EN 12845:2015+A2:2026) has been prepared by Technical Committee CEN/TC 191 “Fixed firefighting systems”, the secretariat of which is held by BSI.

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 October 2026, and conflicting national standards shall be withdrawn at the latest by October 2026.

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

This document includes Corrigendum 1 issued by CEN on 20 January 2016, Amendment 1 approved by CEN on 2 October 2016 and Amendment 2 approved by CEN on 19 January 2026.

The start and finish of text introduced or altered by the amendments is indicated in the text by **A1** and **A2**.

The start and finish of text introduced or altered by the corrigendum is indicated in the text by tags **AC**.

This document supersedes **A2** EN 12845:2015+A1:2019 and EN 12845:2015/AC:2016 **A2**.

A2 In comparison with EN 12845:2015+A1:2019, technical modifications have been made to integrate references and usage of EN 17451, EN 12845-2 and EN 12845-3 into this document. **A2**

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

- automatic sprinkler systems (EN 12259);
- gas extinguishing systems (EN 12094);
- powder systems (EN 12416);
- explosion protection systems (ISO 6184);
- foam systems (EN 13565);
- gas systems (EN 12094);
- hydrant and hose reel systems (EN 671);
- smoke and heat control systems (EN 12101).

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of

North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

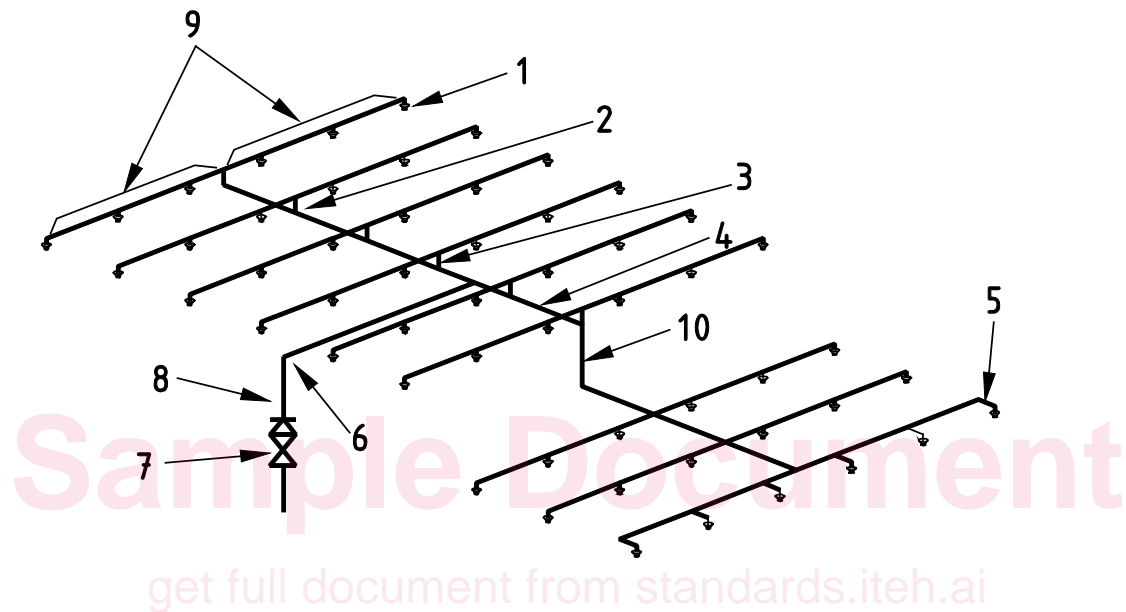
Sample Document

get full document from standards.iteh.ai

Introduction

An automatic sprinkler system is designed to detect a fire and extinguish it with water in its early stages or hold the fire in check so that extinguishment can be completed by other means.

A sprinkler system consists of a water supply (or supplies) and one or more sprinkler installations; each installation consists of a set of installation main control valves and a pipe array fitted with sprinkler heads. The sprinkler heads are fitted at specified locations at the roof or ceiling, and where necessary between racks, below shelves, and in ovens or stoves. The main elements of a typical installation are shown in Figure 1.



Key

1	sprinkler head	6	main distribution pipe
2	riser	7	control valve set
3	design point	8	riser
4	distribution pipe spur	9	range pipes
5	arm pipe	10	drop

Figure 1 — Main elements of a sprinkler installation

The sprinklers operate at predetermined temperatures to discharge water over the affected part of the area below. The flow of water through the alarm valve initiates a fire alarm. 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 sprinkler system is intended to extend throughout the premises with only limited exceptions.

It should not be assumed that the provision of a sprinkler 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.

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

It is essential that sprinkler 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 sprinkler systems are out of service extra attention should be paid to fire precautions and the appropriate authorities informed.

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 sprinkler systems. Similarly, competent technicians should be used in the installation and testing of the equipment (see Annex M).

Sample Document

get full document from standards.iteh.ai