



# SLOVENSKI STANDARD

**SIST EN 12845:2015**

**01-september-2015**

**Nadomešča:**

**SIST EN 12845:2005+A2:2009**

---

**Vgrajene naprave za gašenje - Avtomatski sprinklerski sistemi - Projektiranje, vgradnja in vzdrževanje**

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

Ortsfeste Brandbekämpfungsanlagen - Automatische Sprinkleranlagen - Planung, Installation und Instandhaltung  
**(standards.iteh.ai)**

Installations fixes de lutte contre l'incendie Systèmes d'extinction automatique du type sprinkleur - Conception//installation//entretien  
<https://standards.iteh.ai/096c836e-9318-44bc-a71f-fce1373add3/sist-en-12845-2015>

**Ta slovenski standard je istoveten z: EN 12845:2015**

---

**ICS:**

13.220.10      Gašenje požara      Fire-fighting

**SIST EN 12845:2015      en,fr,de**

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 12845:2015](#)

<https://standards.iteh.ai/catalog/standards/sist/096c836e-9318-44bc-a71f-fce1373addd3/sist-en-12845-2015>

**EUROPEAN STANDARD**  
**NORME EUROPÉENNE**  
**EUROPÄISCHE NORM**

**EN 12845**

June 2015

ICS 13.220.20

Supersedes EN 12845:2004+A2:2009

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 20 December 2014.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

SIST EN 12845:2015

<https://standards.iteh.ai/catalog/standards/sist/096c836e-9318-44bc-a71f-fce1373addd3/sist-en-12845-2015>



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

## Contents

	Page
<b>Foreword.....</b>	<b>12</b>
<b>Introduction .....</b>	<b>13</b>
<b>1 Scope .....</b>	<b>15</b>
<b>2 Normative references .....</b>	<b>15</b>
<b>3 Terms and definitions .....</b>	<b>16</b>
<b>4 Contract planning and documentation.....</b>	<b>23</b>
<b>4.1 General.....</b>	<b>23</b>
<b>4.2 Initial considerations .....</b>	<b>23</b>
<b>4.3 Preliminary or estimating stage .....</b>	<b>23</b>
<b>4.4 Design stage.....</b>	<b>24</b>
<b>4.4.1 General.....</b>	<b>24</b>
<b>4.4.2 Summary schedule .....</b>	<b>24</b>
<b>4.4.3 Installation layout drawings .....</b>	<b>25</b>
<b>4.4.4 Water supply .....</b>	<b>28</b>
<b>5 Extent of sprinkler protection.....</b>	<b>30</b>
<b>5.1 Buildings and areas to be protected.....</b>	<b>30</b>
<b>5.1.1 General.....</b>	<b>30</b>
<b>5.1.2 Permitted exceptions within a building.....</b>	<b>30</b>
<b>5.1.3 Necessary exceptions .....</b>	<b>30</b>
<b>5.2 Storage in the open air .....</b>	<b>30</b>
<b>5.3 Fire resistant separation .....</b>	<b>30</b>
<b>5.4 Protection of concealed spaces <small>itch.ai/catalog/standards/sist/096c836e-9318-44bc-a71f-5</small></b> .....	<b>31</b>
<b>5.5 Height difference between the highest and lowest sprinklers.....</b>	<b>31</b>
<b>6 Classification of occupancies and fire hazards .....</b>	<b>31</b>
<b>6.1 General.....</b>	<b>31</b>
<b>6.2 Hazard classes .....</b>	<b>31</b>
<b>6.2.1 General.....</b>	<b>31</b>
<b>6.2.2 Light Hazard – LH .....</b>	<b>31</b>
<b>6.2.3 Ordinary Hazard – OH .....</b>	<b>31</b>
<b>6.2.4 High Hazard – HH.....</b>	<b>32</b>
<b>6.3 Storage.....</b>	<b>33</b>
<b>6.3.1 General.....</b>	<b>33</b>
<b>6.3.2 Storage Configuration.....</b>	<b>33</b>
<b>7 Hydraulic design criteria.....</b>	<b>36</b>
<b>7.1 LH, OH and HHP.....</b>	<b>36</b>
<b>7.2 High Hazard Storage – HHS.....</b>	<b>37</b>
<b>7.2.1 General.....</b>	<b>37</b>
<b>7.2.2 Ceiling or roof protection only .....</b>	<b>37</b>
<b>7.2.3 Intermediate level in-rack sprinklers .....</b>	<b>38</b>
<b>7.3 Pressure and flow requirements for pre-calculated systems .....</b>	<b>40</b>
<b>7.3.1 LH and OH systems .....</b>	<b>40</b>
<b>7.3.2 HHP and HHS systems without in-rack sprinklers .....</b>	<b>40</b>
<b>8 Water supplies .....</b>	<b>42</b>
<b>8.1 General.....</b>	<b>42</b>
<b>8.1.1 Duration .....</b>	<b>42</b>
<b>8.1.2 Continuity .....</b>	<b>42</b>
<b>8.1.3 Frost protection .....</b>	<b>43</b>

8.2	Maximum water pressure .....	43
8.3	Connections for other services .....	44
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 .....	46
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 .....	57
10.1	General .....	57
10.2	Multiple pump arrangements .....	57
10.3	Compartments for pumpsets .....	58
10.3.1	General .....	58
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 .....	59
10.7	Performance characteristics .....	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 .....	64
10.7.4	Pressure and water capacity of boosted town mains .....	65
10.7.5	Pressure switches .....	65
10.8	Electrically driven pumpsets.....	65
10.8.1	General .....	65

## EN 12845:2015 (E)

10.8.2 Electricity supply .....	65
10.8.3 Main switchboard.....	66
10.8.4 Installation between the main switchboard and the pump controller .....	67
10.8.5 Pump controller .....	67
10.8.6 Monitoring of pump operation.....	67
10.9 Diesel engine driven pumpsets .....	67
10.9.1 General.....	67
10.9.2 Engines .....	68
10.9.3 Cooling system .....	68
10.9.4 Air filtration.....	68
10.9.5 Exhaust system.....	68
10.9.6 Fuel, fuel tank and fuel feed pipes .....	68
10.9.7 Starting mechanism .....	69
10.9.8 Electric starter motor batteries .....	70
10.9.9 Battery chargers .....	70
10.9.10 Siting of batteries and chargers .....	70
10.9.11 Starter alarm indication.....	71
10.9.12 Tools and spare parts .....	71
10.9.13 Engine tests and exercising .....	71
 11 Installation type and size .....	72
11.1 Wet pipe installations .....	72
11.1.1 General.....	72
11.1.2 Protection against freezing.....	72
11.1.3 Size of installations .....	72
11.2 Dry pipe installations .....	73
11.2.1 General.....	73
11.2.2 Size of installations .....	73
11.3 Alternate installations .....	73
11.3.1 General.....	73
11.3.2 Size of installations <a href="https://standards.iteh.ai/catalog/standard/list/006836c0318441bcfa71f">https://standards.iteh.ai/catalog/standard/list/006836c0318441bcfa71f</a> .....	74
11.4 Pre-action installations .....	74
11.4.1 General.....	74
11.4.2 Automatic detection system.....	74
11.4.3 Size of installations .....	75
11.5 Subsidiary dry pipe or alternate extension .....	75
11.5.1 General.....	75
11.5.2 Size of subsidiary extensions .....	75
11.6 Subsidiary water spray extension.....	75
 12 Spacing and location of sprinklers .....	75
12.1 General.....	75
12.2 Maximum area of coverage per sprinkler.....	76
12.3 Minimum distance between sprinklers.....	77
12.4 Location of sprinklers in relation to building construction.....	78
12.5 Intermediate sprinklers in HH occupancies .....	84
12.5.1 General.....	84
12.5.2 Maximum vertical distance between sprinklers at intermediate levels .....	84
12.5.3 Horizontal position of sprinklers at intermediate levels.....	84
12.5.4 Numbers of rows of sprinklers at each level .....	86
12.5.5 HHS intermediate sprinklers in non-shelved racks.....	86
12.5.6 HHS intermediate sprinklers below solid or slatted shelves in racks (ST5 and ST6) .....	87
 13 Pipe sizing and layout .....	88
13.1 General.....	88
13.2 Calculation of pressure losses in pipework .....	88
13.2.1 Pipe friction loss .....	88
13.2.2 Static pressure difference.....	89

13.2.3	Velocity .....	89
13.2.4	Pressure loss through fittings and valves .....	89
13.2.5	Accuracy of calculations .....	90
13.3	Pre-calculated systems.....	91
13.3.1	General .....	91
13.3.2	Location of Design Points .....	91
13.3.3	Light Hazard - LH.....	92
13.3.4	Ordinary Hazard - OH .....	93
13.3.5	High hazard - HHP and HHS (except intermediate level sprinklers) .....	95
13.4	Fully calculated systems .....	103
13.4.1	Design density .....	103
13.4.2	Locations of the area of operation .....	104
13.4.3	Shape of the area of operation.....	104
13.4.4	Minimum sprinkler discharge pressure .....	108
13.4.5	Minimum pipe diameters .....	108
14	Sprinkler design characteristics and uses .....	108
14.1	General .....	108
14.2	Sprinkler types and application .....	108
14.2.1	General .....	108
14.2.2	Ceiling, flush, recessed and concealed pattern .....	109
14.2.3	Sidewall pattern .....	109
14.2.4	Flat spray pattern .....	109
14.3	Flow from sprinklers .....	109
14.4	Sprinkler temperature ratings .....	110
14.5	Sprinkler thermal sensitivity .....	111
14.5.1	General .....	111
14.5.2	Interaction with other measures .....	111
14.6	Sprinkler guards .....	111
14.7	Sprinkler water shields .....	111
14.8	Sprinkler rosettes .....	112
14.9	Corrosion protection of sprinklers .....	112
15	Valves .....	112
15.1	Control valve set.....	112
15.2	Stop valves.....	112
15.3	Ring main valves .....	112
15.4	Drain valves .....	112
15.5	Test valves .....	113
15.5.1	Alarm and pump start test valves .....	113
15.5.2	Remote test valves .....	113
15.6	Flushing connections .....	114
15.7	Pressure gauges.....	114
15.7.1	General .....	114
15.7.2	Water supply connections .....	114
15.7.3	Control valve set.....	114
15.7.4	Removal.....	115
16	Alarms and alarm devices .....	115
16.1	Water flow alarms .....	115
16.1.1	General .....	115
16.1.2	Water motor and gong .....	115
16.1.3	Piping to water motor.....	115
16.2	Electrical water flow and pressure switches .....	115
16.2.1	General .....	115
16.2.2	Water flow alarm switches .....	115
16.2.3	Dry and pre-action systems .....	116
16.3	Fire brigade and remote central station alarm connection.....	116

## EN 12845:2015 (E)

17	Pipework .....	116
17.1	General.....	116
17.1.1	Underground piping .....	116
17.1.2	Above ground piping.....	116
17.1.3	Welding of steel pipe .....	116
17.1.4	Flexible pipes and joints .....	117
17.1.5	Concealment .....	117
17.1.6	Protection against fire and mechanical damage .....	117
17.1.7	Painting .....	117
17.1.8	Drainage.....	117
17.1.9	Copper pipe .....	118
17.2	Pipe supports .....	118
17.2.1	General.....	118
17.2.2	Spacing and location.....	118
17.2.3	Design .....	119
17.3	Pipework in concealed spaces .....	119
17.3.1	General.....	119
17.3.2	False ceilings above OH occupancies .....	120
17.3.3	All other cases .....	120
18	Signs, notices, and information .....	120
18.1	Block plan.....	120
18.2	Signs and notices .....	120
18.2.1	Location plate.....	120
18.2.2	Signs for stop valves.....	120
18.2.3	Control valve set.....	121
18.2.4	Water supply connections to other services .....	121
18.2.5	Suction and booster pumps .....	121
18.2.6	Electric switches and control panels.....	122
18.2.7	Testing and operating devices .....	122
19	Commissioning .....	122
19.1	Commissioning tests .....	122
19.1.1	Pipework .....	122
19.1.2	Equipment .....	123
19.1.3	Water supplies .....	123
19.2	Completion certificate and documents .....	123
20	Maintenance .....	123
20.1	General.....	123
20.1.1	Introduction .....	123
20.1.2	Programmed work .....	123
20.1.3	Precautions while carrying out work .....	124
20.1.4	Replacement sprinklers .....	124
20.2	User's programme of inspection and checking .....	124
20.2.1	General.....	124
20.2.2	Weekly routine .....	124
20.2.3	Monthly routine .....	125
20.3	Service, testing and maintenance schedule .....	125
20.3.1	General.....	125
20.3.2	Quarterly routine .....	125
20.3.3	Half-yearly routine .....	127
20.3.4	Yearly routine .....	127
20.3.5	3 Yearly routine .....	128
20.3.6	10 yearly routine .....	128
21	Third party inspection .....	128
	Annex A (normative) Classification of typical hazards .....	129

<b>Annex B (normative) Methodology for categorizing stored goods .....</b>	<b>132</b>	
<b>B.1 General .....</b>	<b>132</b>	
<b>B.2 Material factor (M).....</b>	<b>132</b>	
<b>B.2.1 General .....</b>	<b>132</b>	
<b>B.2.2 Material Factor 1 .....</b>	<b>132</b>	
<b>B.2.3 Material factor 2 .....</b>	<b>133</b>	
<b>B.2.4 Material factor 3 .....</b>	<b>134</b>	
<b>B.2.5 Material factor 4 .....</b>	<b>134</b>	
<b>B.3 Storage configuration .....</b>	<b>134</b>	
<b>B.3.1 Effect of storage configuration .....</b>	<b>134</b>	
<b>B.3.2 Exposed plastic container with non-combustible content .....</b>	<b>135</b>	
<b>B.3.3 Exposed plastic surface – unexpanded .....</b>	<b>135</b>	
<b>B.3.4 Exposed plastic surface – expanded .....</b>	<b>135</b>	
<b>B.3.5 Open structure .....</b>	<b>135</b>	
<b>B.3.6 Solid block materials.....</b>	<b>136</b>	
<b>B.3.7 Granular or powdered materials .....</b>	<b>136</b>	
<b>B.3.8 No special configuration.....</b>	<b>136</b>	
<b>Annex C (normative) Alphabetical listing of stored products and categories .....</b>	<b>137</b>	
<b>Annex D (normative) Zoning of sprinkler installations .....</b>	<b>141</b>	
<b>D.1 General .....</b>	<b>SIST EN 12845:2015 https://standards.iteh.ai/catalog/standards/sist/096c836e-9318-44bc-a71f-fce1373add3/sist-en-12845-2015</b>	<b>141</b>
<b>D.2 Zoning of installations .....</b>	<b>141</b>	
<b>D.3 Requirements for zoned installations .....</b>	<b>141</b>	
<b>D.3.1 Extent of zones .....</b>	<b>141</b>	
<b>D.3.2 Zone subsidiary stop valves .....</b>	<b>141</b>	
<b>D.3.3 Flushing Valves .....</b>	<b>141</b>	
<b>D.3.4 Monitoring .....</b>	<b>142</b>	
<b>D.3.5 Zone test and drainage facilities.....</b>	<b>142</b>	
<b>D.3.6 Installation control valve set .....</b>	<b>142</b>	
<b>D.3.7 Installation monitoring and alarms.....</b>	<b>142</b>	
<b>D.4 Block plan.....</b>	<b>143</b>	
<b>Annex E (normative) Special requirements for high rise systems .....</b>	<b>144</b>	
<b>E.1 General .....</b>	<b>144</b>	
<b>E.2 Design criteria.....</b>	<b>144</b>	
<b>E.2.1 Hazard group .....</b>	<b>144</b>	
<b>E.2.2 Subdivision of high rise sprinkler systems .....</b>	<b>144</b>	
<b>E.2.3 Standing water pressures at non-return and alarm valves.....</b>	<b>144</b>	
<b>E.2.4 Calculation of distribution pipework for pre-calculated systems .....</b>	<b>144</b>	
<b>E.2.5 Water pressures .....</b>	<b>144</b>	

## EN 12845:2015 (E)

<b>E.3</b>	<b>Water supplies .....</b>	<b>145</b>
<b>E.3.1</b>	<b>Types of water supplies .....</b>	<b>145</b>
<b>E.3.2</b>	<b>Pressure and flow requirements for pre-calculated installations .....</b>	<b>145</b>
<b>E.3.3</b>	<b>Water supply characteristics for pre-calculated installations .....</b>	<b>145</b>
<b>E.3.4</b>	<b>Pump performance for pre-calculated installations.....</b>	<b>145</b>
<b>Annex F (normative) Additional measures to improve system reliability and availability .....</b>		<b>148</b>
<b>F.1</b>	<b>General.....</b>	<b>148</b>
<b>F.2</b>	<b>Subdivision into zones.....</b>	<b>148</b>
<b>F.3</b>	<b>Wet pipe installations .....</b>	<b>148</b>
<b>F.4</b>	<b>Sprinkler type and sensitivity.....</b>	<b>148</b>
<b>F.5</b>	<b>Control valve set.....</b>	<b>148</b>
<b>F.6</b>	<b>Water supplies .....</b>	<b>148</b>
<b>F.7</b>	<b>Additional measures for theatres.....</b>	<b>148</b>
<b>F.8</b>	<b>Additional precautions for maintenance .....</b>	<b>149</b>
<b>Annex G (normative) Protection of special hazards.....</b>		<b>150</b>
<b>G.1</b>	<b>General.....</b>	<b>150</b>
<b>G.2</b>	<b>Aerosols.....</b>	<b>150</b>
<b>G.3</b>	<b>Clothes in multiple garment hanging storage .....</b>	<b>150</b>
<b>G.3.1</b>	<b>General.....</b>	<b>150</b>
<b>G.3.2</b>	<b>Categorization .....</b>	<b>150</b>
<b>G.3.3</b>	<b>Sprinkler protection other than at ceiling .....</b>	<b>151</b>
<b>G.3.4</b>	<b>Sprinklers in operation.....</b>	<b>151</b>
<b>G.3.5</b>	<b>Ceiling sprinklers.....</b>	<b>151</b>
<b>G.3.6</b>	<b>Automatic shutdown .....</b>	<b>151</b>
<b>G.3.7</b>	<b>Control valve set.....</b>	<b>151</b>
<b>G.4</b>	<b>Flammable liquid storage .....</b>	<b>152</b>
<b>G.5</b>	<b>Idle pallets .....</b>	<b>153</b>
<b>G.6</b>	<b>Spirit based liquors in wooden barrels .....</b>	<b>154</b>
<b>G.7</b>	<b>Non-woven synthetic fabric.....</b>	<b>154</b>
<b>G.7.1</b>	<b>Free standing storage .....</b>	<b>154</b>
<b>G.7.2</b>	<b>Rack storage .....</b>	<b>155</b>
<b>G.8</b>	<b>Polypropylene or polyethylene storage bins .....</b>	<b>155</b>
<b>G.8.1</b>	<b>General.....</b>	<b>155</b>
<b>G.8.2</b>	<b>Classification.....</b>	<b>155</b>
<b>G.8.3</b>	<b>Palletized rack storage (ST4).....</b>	<b>155</b>
<b>G.8.4</b>	<b>All other storage .....</b>	<b>155</b>
<b>G.8.5</b>	<b>Foam additive.....</b>	<b>156</b>
<b>Annex H (normative) Sprinkler systems monitoring .....</b>		<b>157</b>

<b>H.1</b>	<b>General .....</b>	<b>157</b>
<b>H.2</b>	<b>Functions to be monitored .....</b>	<b>157</b>
<b>H.2.1</b>	<b>General .....</b>	<b>157</b>
<b>H.2.2</b>	<b>Stop valves controlling water flow to sprinklers .....</b>	<b>157</b>
<b>H.2.3</b>	<b>Other stop valves .....</b>	<b>157</b>
<b>H.2.4</b>	<b>Liquid levels .....</b>	<b>157</b>
<b>H.2.5</b>	<b>Pressures .....</b>	<b>157</b>
<b>H.2.6</b>	<b>Electrical power .....</b>	<b>158</b>
<b>H.2.7</b>	<b>Temperature .....</b>	<b>158</b>
<b>Annex I</b> (normative) <b>Transmission of alarms .....</b>	<b>159</b>	
<b>I.1</b>	<b>Functions to be monitored .....</b>	<b>159</b>
<b>I.2</b>	<b>Alarm levels .....</b>	<b>160</b>
<b>Annex J</b> (informative) <b>Precautions and procedures when a system is not fully operational .....</b>	<b>161</b>	
<b>J.1</b>	<b>Minimizing the effects .....</b>	<b>161</b>
<b>J.2</b>	<b>Planned shut-down .....</b>	<b>161</b>
<b>J.3</b>	<b>Unplanned shut-down .....</b>	<b>162</b>
<b>J.4</b>	<b>Action following sprinkler operation .....</b>	<b>162</b>
<b>J.4.1</b>	<b>General .....</b>	<b>162</b>
<b>J.4.2</b>	<b>Installations protecting cold storage warehouses (air circulation refrigeration) .....</b>	<b>162</b>
<b>Annex K</b> (informative) <b>Twenty-five year inspection .....</b>	<b>163</b>	
<b>Annex L</b> (informative) <b>Special technology .....</b>	<b>164</b>	
<b>Annex M</b> (informative) <b>Independent certification body .....</b>	<b>165</b>	
<b>Annex N</b> (normative) <b>Control Mode Specific Application Sprinklers: CMSA .....</b>	<b>166</b>	
<b>N.1</b>	<b>Introduction .....</b>	<b>166</b>
<b>N.1.1</b>	<b>General .....</b>	<b>166</b>
<b>N.1.2</b>	<b>Definitions .....</b>	<b>166</b>
<b>N.1.3</b>	<b>General .....</b>	<b>166</b>
<b>N.1.4</b>	<b>Sprinkler type and temperature rating .....</b>	<b>166</b>
<b>N.1.5</b>	<b>Water demand .....</b>	<b>167</b>
<b>N.2</b>	<b>Sprinkler location .....</b>	<b>167</b>
<b>N.2.1</b>	<b>Sprinkler spacing .....</b>	<b>167</b>
<b>N.2.2</b>	<b>Range pipe sizes .....</b>	<b>167</b>
<b>N.2.3</b>	<b>Minimum clear space below sprinklers .....</b>	<b>167</b>
<b>N.2.4</b>	<b>Excessive clearance .....</b>	<b>167</b>
<b>N.2.5</b>	<b>Distance of sprinklers below ceiling .....</b>	<b>167</b>
<b>N.2.6</b>	<b>Location of sprinklers in beam and girder, concrete T and panel construction .....</b>	<b>168</b>
<b>N.2.7</b>	<b>Obstructions to sprinkler distribution .....</b>	<b>168</b>
<b>N.3</b>	<b>Design .....</b>	<b>172</b>

## EN 12845:2015 (E)

<b>Annex O (informative) Example of P&amp;ID .....</b>	<b>177</b>	
<b>Annex P (normative) ESFR sprinkler protection.....</b>	<b>178</b>	
<b>P.1 Introduction .....</b>	<b>178</b>	
<b>P.2 Scope .....</b>	<b>178</b>	
<b>P.3 Definitions .....</b>	<b>178</b>	
<b>P.3.1 Sprinkler, ESFR pattern .....</b>	<b>178</b>	
<b>P.3.2 Suppression mode.....</b>	<b>178</b>	
<b>P.3.3 Classification of goods .....</b>	<b>178</b>	
<b>P.3.4 Ceiling height .....</b>	<b>179</b>	
<b>P.3.5 Laced tyre storage .....</b>	<b>179</b>	
<b>P.3.6 Paper categories, based on weight.....</b>	<b>179</b>	
<b>P.4 Contract arrangements .....</b>	<b>179</b>	
<b>P.5 General.....</b>	<b>179</b>	
<b>P.6 Occupancies and fire hazards.....</b>	<b>180</b>	
<b>P.7 Racked, shelved and post pallet storage .....</b>	<b>180</b>	
<b>P.7.1 Longitudinal and transverse flues .....</b>	<b>180</b>	
<b>P.7.2 Shelving .....</b>	<b>iTech STANDARD REVIEW (standards.itech.ai)</b>	
<b>P.7.3 In-rack sprinklers for ESFR systems.....</b>	<b>181</b>	
<b>P.7.4 Design requirements .....</b>	<b>181</b>	
<b>P.8 Building requirements.....</b>	<b>SIST EN 12845:2015 <a href="https://standards.itech.ai/catalog/standards/sist/096c836e-9318-44bc-a71f-fce1373add3/sist-en-12845-2015">https://standards.itech.ai/catalog/standards/sist/096c836e-9318-44bc-a71f-fce1373add3/sist-en-12845-2015</a></b>	<b>197</b>
<b>P.8.1 Roof or ceiling slope .....</b>		<b>197</b>
<b>P.8.2 Measures required to correct excessive roof or ceiling slope .....</b>		<b>197</b>
<b>P.8.3 Ceiling strength.....</b>		<b>198</b>
<b>P.8.4 Sky lights .....</b>		<b>198</b>
<b>P.8.5 Powered ventilation.....</b>		<b>198</b>
<b>P.8.6 Walkways and conveyors .....</b>		<b>200</b>
<b>P.8.7 Sprinkler protection beneath mezzanines .....</b>		<b>200</b>
<b>P.9 ESFR sprinkler installation design .....</b>		<b>200</b>
<b>P.9.1 Installation type.....</b>		<b>200</b>
<b>P.9.2 Sprinkler nominal k-factor .....</b>		<b>200</b>
<b>P.9.3 Temperature ratings thermal sensitivity and colour codings .....</b>		<b>200</b>
<b>P.9.4 ESFR sprinkler location relative to obstructions at or near the ceiling or roof .....</b>		<b>201</b>
<b>P.10 Pipe sizing .....</b>		<b>202</b>
<b>P.10.1 General.....</b>		<b>202</b>
<b>P.10.2 Minimum pipe sizes .....</b>		<b>202</b>
<b>P.10.3 Minimum ESFR sprinkler flow pressure.....</b>		<b>202</b>
<b>P.10.4 The number of sprinklers assumed to be operating.....</b>		<b>202</b>
<b>P.10.5 Shape of design sprinkler area .....</b>		<b>203</b>

P.10.6 Sprinklers beneath obstructions .....	203
P.11 Sprinkler spacing and location .....	203
P.11.1 ESFR sprinkler area of coverage .....	203
P.11.2 Obstructions .....	203
P.11.3 Sprinkler positioning relative to roof and ceilings .....	204
P.11.4 Sprinkler orientation relative to the floor or pipework .....	204
P.11.5 Clear space below sprinklers .....	204
P.11.6 Sprinkler location relative to draught or smoke curtains .....	204
P.11.7 Positioning of ESFR sprinklers relative to draught or smoke curtains .....	204
P.11.8 ESFR sprinkler protection adjacent to areas protected by standard sprinklers .....	204
P.12 Water supplies .....	205
P.12.1 Pump drive and power arrangements .....	205
P.12.2 Pump selection .....	205
P.12.3 Duration .....	205
Bibliography .....	206

## iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 12845:2015

<https://standards.iteh.ai/catalog/standards/sist/096c836e-9318-44bc-a71f-fce1373addd3/sist-en-12845-2015>

## Foreword

This document (EN 12845:2015) 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 December 2015, and conflicting national standards shall be withdrawn at the latest by December 2015.

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.

This document supersedes EN 12845:2004+A2:2009.

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

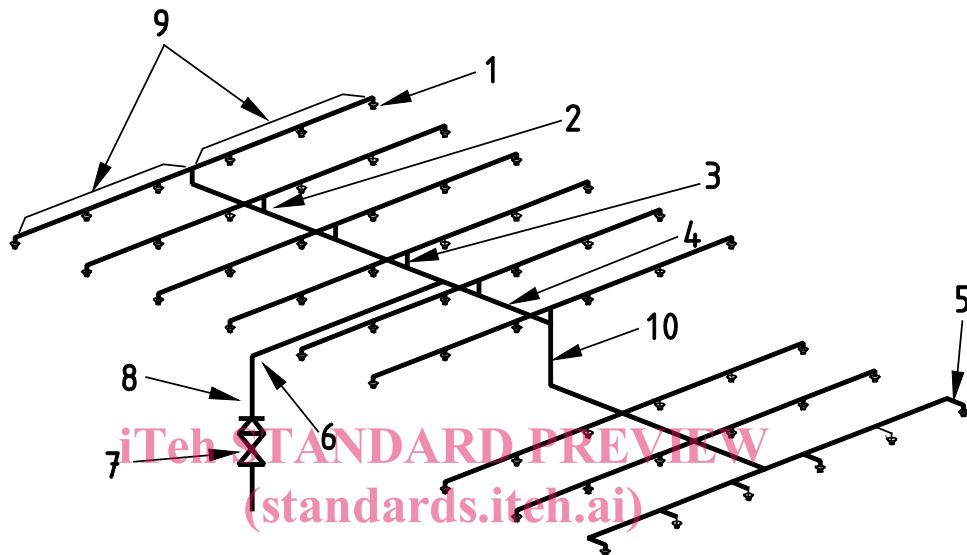
- automatic sprinkler systems (EN 12259);
- gas extinguishing systems (EN 12094);
- powder systems (EN 12416);
- explosion protection systems (ISO 6184);  
**STANDARD PREVIEW**  
**(standards.iteh.ai)**
- foam systems (EN 13565);
- gas systems (EN 12094);  
**SIST EN 12845:2015**
- hydrant and hose reel systems (EN 671);  
<https://standards.iteh.ai/catalog/standards/sist/096c836e-9318-44bc-a71fce1373add3/sist-en-12845-2015>
- 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 implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## 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

[SIST EN 12845:2015](https://standards.itech.ai/catalog/standards/sist/096c836e-9318-44bc-a71f-000000000000)  
<https://standards.itech.ai/catalog/standards/sist/096c836e-9318-44bc-a71f-000000000000>

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