

## Italian Fire Code

The Italian Fire Code published on 3 August 2015 introduces risk profiles and offers incentives for the fitting of sprinklers. This code is an alternative to the collection of occupancy-specific prescriptive codes in place for many years, which are set out from page five. The risk profiles are made up of a letter, as in Table G.3-1, to characterise the type of people in the building and a number, as in Table G.3-2, to characterise the rate of fire growth.

Table G.3-3 specifies the risk profile for a number of common occupancies detailed in another decree from 7 August 2012. Note 4 states that the fire growth rate may be reduced by one level if the building is fitted throughout with a fire protection system, defined as a system to control or extinguish fire (such as sprinklers).

Table G.3-4 gives life risk profiles and also permits a reduction in fire growth rate by one level in the presence of a fire protection system. Most risk profiles with a fire growth rate of 4, the fastest rate, are not permitted but with sprinklers the fire growth rate becomes 3 and they are permitted. An example would be a high bay warehouse of risk profile A4 becoming A3 with sprinklers. Table G.3-5 lists some more common occupancies and their risk profiles.

Table S.1-2 sets out the classifications for the reaction to fire of building elements. If sprinklers are fitted, the risk profile B2 becomes B1 and the level of protection against reaction to fire drops from Level III to Level II, as in Table S.1-1.

### **Maximum compartment sizes**

Table S.3-4, as below, sets out the maximum compartment sizes for each risk profile. Many can be doubled or more if a sprinkler system is fitted, for example to change B3 to B2.

| <b>R<sub>vita</sub></b>           | <b>Compartment Floor Level</b> |         |        |        |        |        |        |        |        |
|-----------------------------------|--------------------------------|---------|--------|--------|--------|--------|--------|--------|--------|
|                                   | < -15 m                        | < -10 m | < -5 m | < -1 m | ≤ 12 m | ≤ 24 m | ≤ 32 m | ≤ 54 m | > 54 m |
| A1                                | 2000                           | 4000    | 8000   | 16000  | [1]    | 32000  | 16000  | 8000   | 4000   |
| A2                                | 1000                           | 2000    | 4000   | 8000   | [1]    | 16000  | 8000   | 4000   | 2000   |
| A3                                | [na]                           | 1000    | 2000   | 4000   | 32000  | 4000   | 2000   | 1000   | [na]   |
| A4                                | [na]                           | [na]    | [na]   | [na]   | 16000  | [na]   | [na]   | [na]   | [na]   |
| B1                                | [na]                           | 2000    | 8000   | 16000  | [1]    | 16000  | 8000   | 4000   | 2000   |
| B2                                | [na]                           | 1000    | 4000   | 8000   | 32000  | 8000   | 4000   | 2000   | 1000   |
| B3                                | [na]                           | [na]    | 1000   | 2000   | 16000  | 4000   | 2000   | 1000   | [na]   |
| C1                                | [na]                           | [na]    | [na]   | 2000   | [1]    | 16000  | 8000   | 8000   | 4000   |
| C2                                | [na]                           | [na]    | [na]   | 1000   | 8000   | 4000   | 4000   | 2000   | 2000   |
| C3                                | [na]                           | [na]    | [na]   | [na]   | 4000   | 2000   | 2000   | 1000   | 1000   |
| D1                                | [na]                           | [na]    | [na]   | 2000   | 4000   | 2000   | 1000   | 1000   | 1000   |
| D2                                | [na]                           | [na]    | [na]   | 1000   | 2000   | 1000   | 1000   | 1000   | [na]   |
| E1                                | 2000                           | 4000    | 8000   | 16000  | [1]    | 32000  | 16000  | 8000   | 4000   |
| E2                                | 1000                           | 2000    | 4000   | 8000   | [1]    | 16000  | 8000   | 4000   | 2000   |
| E3                                | [na]                           | [na]    | 2000   | 4000   | 16000  | 4000   | 2000   | [na]   | [na]   |
| [na] not allowed    [1] unlimited |                                |         |        |        |        |        |        |        |        |

### **Structural fire resistance**

S.2.6 states that EN 1991-1-2 may be used to calculate the structural fire resistance. This standard offers a reduction of 39% in assumed fire load if sprinklers are fitted. That leads to a reduction in the structural fire resistance required. Alternatively there is a method in 2.9 to calculate the fire load which gives a reduction of 46% if sprinklers are fitted, as set out in Table S.2-6.

### **Travel distances**

Table S.4.9 sets out the maximum travel distances for escape (travel distance) in two possible directions or in only one. By fitting sprinklers the risk profile can be reduced, so for example B3 becomes B2 and the maximum lengths increase from 40 m to 50 m for two-way travel and from 15 m to 20 m for single direction travel.

| <b>R<sub>life</sub></b> | <b>Two-way travel distance [m]</b> | <b>One way travel distance [m]</b> |
|-------------------------|------------------------------------|------------------------------------|
| <b>A1</b>               | 70                                 | 30                                 |
| <b>A2</b>               | 60                                 | 25                                 |
| <b>A3</b>               | 45                                 | 20                                 |
| <b>A4</b>               | 30                                 | 15                                 |
| <b>B1, E1</b>           | 60                                 | 25                                 |
| <b>B2, E2</b>           | 50                                 | 20                                 |
| <b>B3, E3</b>           | 40                                 | 15                                 |
| <b>C1</b>               | 40                                 | 20                                 |
| <b>C2, D1</b>           | 30                                 | 15                                 |
| <b>C3, D2</b>           | 20                                 | 10                                 |

Table S.4.9

### **Widths of horizontal escape routes**

The minimum widths of horizontal escape routes are calculated per person for each risk profile using the figures in Table S.4.10. With sprinklers, the risk profile is reduced and the escape routes may be less wide, subject to certain minima.

| <b>R<sub>life</sub></b> | <b>Unitary width [mm/person]</b> | <b>R<sub>life</sub></b> | <b>Unitary width [mm/person]</b> |
|-------------------------|----------------------------------|-------------------------|----------------------------------|
| <b>A1</b>               | 3.4                              | <b>B1, C1, E1</b>       | 3.6                              |
| <b>A2</b>               | 3.8                              | <b>B2, C2, D1, E2</b>   | 4.1                              |
| <b>A3</b>               | 4.6                              | <b>B3, C3, D2, E3</b>   | 6.2                              |
| <b>A4</b>               | 12.3                             |                         |                                  |

Table S.4-10: Unitary widths for horizontal escape routes

### **Widths of vertical escape routes (staircases)**

The widths of vertical escape routes are calculated using the figures in Table S.4.12. Again, with sprinklers the total width of the vertical escape routes may be narrower. This may save a staircase.

| <b>R<sub>life</sub></b> | <b>Total number of floors served by the vertical escape route</b> |          |          |          |          |          |          |          |          |               |
|-------------------------|---|----------|----------|----------|----------|----------|----------|----------|----------|---------------|
|                         | <b>1</b>  | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> | <b>7</b> | <b>8</b> | <b>9</b> | <b>&gt; 9</b> |
| <b>A1</b>               | 4.00  | 3.60     | 3.25     | 3.00     | 2.75     | 2.55     | 2.40     | 2.25     | 2.10     | 2.00          |
| <b>B1, C1, E1</b>       | 4.25  | 3.80     | 3.40     | 3.10     | 2.85     | 2.65     | 2.45     | 2.30     | 2.15     | 2.05          |
| <b>A2</b>               | 4.55  | 4.00     | 3.60     | 3.25     | 3.00     | 2.75     | 2.55     | 2.40     | 2.25     | 2.10          |
| <b>B2, C2, D1, E2</b>   | 4.90  | 4.30     | 3.80     | 3.45     | 3.15     | 2.90     | 2.65     | 2.50     | 2.30     | 2.15          |
| <b>A3</b>               | 5.50  | 4.75     | 4.20     | 3.75     | 3.35     | 3.10     | 2.85     | 2.60     | 2.45     | 2.30          |
| <b>B3, C3, D2, E3</b>   | 7.30  | 6.40     | 5.70     | 5.15     | 4.70     | 4.30     | 4.00     | 3.70     | 3.45     | 3.25          |
| <b>A4</b>               | 14.60   | 11.40    | 9.35     | 7.95     | 6.90     | 6.10     | 5.45     | 4.95     | 4.50     | 4.15          |

The unitary lengths must be increased based on the indications in Table S.4-13 in relation to the stair step riser and tread and the type of stairway.

*Table S.4-12: Escape stairway unitary width in mm/person*

## **Facilities for fire-fighting**

Facilities for fire-fighting may also be relaxed if sprinklers are fitted.

| <b>Facilities for fire-fighting</b> | <b>Assignment criteria</b>   |
|-------------------------------------|--|
| <b>I</b>                            | Insufficient in buildings  |
| <b>II</b>                           | Activities where all of the following conditions have been met: <ul style="list-style-type: none"> <li>• Risk profiles:               <ul style="list-style-type: none"> <li>○ <math>R_{life}</math> included in A1, A2, B1, B2, Ci1, Ci2;</li> <li>○ <math>R_{prop}</math> equal to 1;</li> <li>○ <math>R_{env}</math> not significant;</li> </ul> </li> <li>• crowding density not greater than 0.2 persons/m<sup>2</sup>;</li> <li>• all floors of the activity located at a height between -5 m and 12 m;</li> <li>• gross surface area of each compartment not greater than 4 000 m<sup>2</sup>;</li> <li>• specific fire load <math>q_f</math> not greater than 600 MJ/m<sup>2</sup>;</li> <li>• hazardous substances or mixtures are not used or stored in any significant quantities;</li> <li>• hazardous processes with risk of fire and explosion not performed.</li> </ul> |
| <b>III</b>                          | Activities not included in the other assignment criteria.  |
| <b>IV</b>                           | Activities where at least one of the following conditions is met: <ul style="list-style-type: none"> <li>• The <math>R_{prop}</math> risk profile is between 3 and 4;</li> <li>• high overall crowding:               <ul style="list-style-type: none"> <li>○ if open to the public: occupant loading greater than 300 people;</li> <li>○ if not open to the public: occupant loading greater than 1 000 people;</li> </ul> </li> <li>• overall number of beds greater than 100 and <math>R_{life}</math> risk profiles included in the D1, D2, Ciii1, Ciii2, Ciii3 categories;</li> <li>• hazardous substances or mixtures are used or stored in significant quantities with occupant loading greater than 25 people;</li> <li>• hazardous processing with risk of fire and explosion is performed with occupant loading greater than 25 people.</li> </ul>                          |

Table S.9-2: Facilities for fire fighting

### **S.9.4.2 Compliant solutions for level III**

1. Facilities for fire-fighting must meet those for level II.
2. In the absence of internal protection of the hydrant network in multi-storey buildings, a dry standpipe must be provided as set out in Section 9.5.
3. In the absence of external protection of the site's hydrant network, at least one hydrant connected to the public mains must be available, within a maximum distance of 500 m from the site's property line; this hydrant must be able to supply at least 300 litres/minute.

Thus if a museum with risk category B3 is fitted with a sprinkler system to become B2, the facilities for fire-fighting need to meet level II instead of level III. This means a dry hydrant is not required, nor is an external fire hydrant required.

**The remainder of this summary covers the sprinkler requirements in the occupancy-specific prescriptive codes.**

## Sprinkler Systems are required in Large Italian Hotels

**DECRETO MINISTERIALE 9 aprile 1994** (G.U. n. 95 del 26/4/1994)

### **APPROVAZIONE DELLA REGOLA TECNICA DI PREVENZIONE INCENDI PER LA COSTRUZIONE E L'ESERCIZIO DELLE ATTIVITÀ RICETTIVE TURISTICO-ALBERGHIERE**

#### IL MINISTERO DELL'INTERNO

Vista la legge 27 dicembre 1941, n. 1570;

Visti gli articoli 1 e 2 della legge 13 maggio 1961, n. 469;

Visto l'art. 2 della legge 26 luglio 1965, n. 966;

Visto l'art. 2 della legge 18 luglio 1980, n. 406;

Visto l'art. 6 della legge 17 maggio 1983, n. 818;

Visto il decreto del Presidente della Repubblica 27 aprile 1955, n.547;

Visto il decreto del Presidente della Repubblica 29 luglio 1982, n.577;

Vista la raccomandazione del Consiglio della Comunità Europee del 22 dicembre 1986 per la protezione antincendio degli alberghi già esistenti;

Rilevata la necessità di aggiornare i criteri tecnici di sicurezza contro i rischi di incendio e di panico in edifici destinati ad attività alberghiere attualmente in vigore; Vista la regola tecnica elaborata dal Comitato Centrale Tecnico Scientifico per la prevenzione incendi di cui all'art. 10 del decreto del Presidente della Repubblica 29 luglio 1982, n. 577;

Visto l'art. 11 del citato decreto del Presidente della Repubblica 29 luglio 1982, n. 577.

Espletata la procedura di informazione prevista dalla legge 21 giugno 1986, n. 317;

#### DECRETA:

E' approvata la regola tecnica di prevenzione incendi per la attività ricettive turistico-alberghiere, allegata al presente decreto.

Sono abrogate tutte le disposizioni tecniche attualmente in vigore in materia.

Il presente decreto sarà pubblicato nella Gazzetta Ufficiale della Repubblica italiana.

E' fatto obbligo a chiunque spetti di osservarlo e di farlo osservare.

Roma, 9 aprile 1994

Il Ministro: Mancino

#### 11.3.5 IMPIANTI DI SPEGNIMENTO AUTOMATICO

Oltre alla rete idranti, nelle strutture ricettive con oltre 1000 posti letto, deve essere previsto l'impianto di spegnimento automatico a pioggia su tutta l'attività.

*NOTE: Full text of decree on [www.eurosprinkler.org](http://www.eurosprinkler.org) under Legislation/Italy*

**MINISTERIAL DECREE 9 April 1994** (Official Gazette nr. 95 of 26/4/1994)

**APPROVAL OF THE TECHNICAL RULE FOR FIRE PREVENTION IN THE  
CONSTRUCTION AND OPERATION OF TOURIST-HOTEL ACTIVITIES**

THE MINISTER OF THE INTERIOR

With regard to the law of 27 December 1941, nr. 1570;

With regard to the articles 1 and 2 of the law of 13 May 1961, nr. 469;

With regard to Art. 2 of the law of 26 July 1965, nr. 966;

With regard to Art. 2 of the law of 18 July 1980, nr. 406;

With regard to Art. 6 of the law of 17 May 1983, nr. 818;

With regard to the decree of the President of the Republic of 27 April 1955, nr.547;

With regard to the decree of the President of the Republic of 29 July 1982, nr.577;

With regard to the recommendation of the Council of the European Community of the 22 December 1986 for fire protection in existing hotels;

Recognising the need to modernise the technical rules currently in force for security control of the risks of fire and panic in buildings used for hotel activities;

With regard to the standards prepared by the Central Technical Scientific Committee for the prevention of fire, of which Art. 10 of the decree of the President of the Republic of 29 July 1982, nr. 577;

With regard to Art. 11 of the cited decree of the President of the Republic of 29 July 1982, nr. 577;

Having implemented the procedure of information covered by the law of 21 June 1986, nr. 317;

DECREES:

The technical fire prevention rule for activities related to tourist hotels, attached to the present decree, is approved.

The technical regulations currently in force relating to this subject are all repealed.

The presente decree will be published in the Official Gazette of the Italian Republic. All are required to observe it and see that it is observed.

Rome, 9 April 1994

The Minister: Mancino

11.3.5 AUTOMATIC EXTINGUISHING SYSTEMS

In addition to the hydrant network, buildings with more than 1000 beds must be fitted with an automatic extinguishing system.

## Sprinkler systems are required in many Italian car parks.

**Decreto ministeriale 1° febbraio 1986** (G.U. n.38 del 15 febbraio 1986)

### **NORME DI SICUREZZA ANTINCENDI PER LA COSTRUZIONE E L'ESERCIZIO DI AUTORIMESSE E SIMILE**

#### **IL MINISTRO DELL'INTERNO**

Visto l'art. 1 della legge 13 maggio 1961, n. 469;

Visto l'art. 2 della legge 26 luglio 1965, n. 966;

Visto l'art. 2 della legge 18 luglio 1980, n. 406;

Visto il decreto del Presidente della Repubblica 27 aprile 1955, n.547;

Visto il decreto del Presidente della Repubblica 29 luglio 1982, n.577;

Rilevata la necessità di aggiornare le norme di sicurezza antincendi per la costruzione e l'esercizio di autorimesse e simili;

Viste le norme elaborate dal Comitato Centrale Tecnico Scientifico per la prevenzione incendi di cui all'art. 10 del decreto del Presidente della Repubblica 29 luglio 1982, n. 577;

Visto l'art. 11 del citato decreto del Presidente della Repubblica 29 luglio 1982, n. 577.

#### **DECRETA:**

Sono approvate le norme di sicurezza antincendi per la costruzione e l'esercizio di autorimesse e simili, allegate al presente decreto.

Sono pertanto abrogate tutte le norme attualmente in vigore in materia.

Il presente decreto sarà pubblicato nella Gazzetta Ufficiale della Repubblica italiana.

Roma, addì 1° febbraio 1986

Il Ministro: SCALFARO

## **6. - MEZZI ED IMPIANTI DI PROTEZIONE ED ESTINZIONE DEGLI INCENDI**

### **6.1 Impianti idrici antincendio**

#### **6.1.0 Caratteristiche**

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Le autorimesse oltre il secondo interrato e quelle oltre il quarto fuori terra, se chiuse, e oltre il quinto piano fuori terra, se aperte, e gli autosilo, devono essere sempre protette da impianto fisso di spegnimento automatico.

*NOTE: Full text of decree on [www.eurosprinkler.org](http://www.eurosprinkler.org) under Legislation/Italy*

**Ministerial decree 1<sup>st</sup> February 1986** (Official Gazette nr.38 of 15 February 1986)

**STANDARD FOR FIRE SAFETY IN THE CONSTRUCTION AND OPERATION OF CAR PARKS AND SIMILAR**

**THE MINISTER OF THE INTERIOR**

With regard to Art. 1 of the law of 13 May 1961, nr. 469;

With regard to Art. 2 of the law of 26 July 1965, nr. 966;

With regard to Art. 2 of the law of 18 July 1980, nr. 406;

With regard to the decree of the President of the Republic of 27 April 1955, nr.547;

With regard to the decree of the President of the Republic of 29 July 1982, nr.577;

Recognising the need to modernise the standard for fire safety in the construction and operation of car parks and similar;

With regard to the standards prepared by the Central Technical Scientific Committee for the prevention of fire, of which Art. 10 of the decree of the President of the Republic of 29 July 1982, nr. 577;

With regard to Art. 11 of the cited decree of the President of the Republic of 29 July 1982, nr. 577;

**DECREES:**

The fire protection standards for the construction and operation of car parks and similar, attached to the present decree, are approved.

The standards pertinent to this matter currently in vigour are repealed.

The present decree will be published in the Official Gazette of the Italian Republic.

Rome, 1<sup>st</sup> February 1986

The Minister: SCALFARO

**6 - MEANS AND SYSTEMS TO PROTECT AND EXTINGUISH FIRES**

**6.1 Water Fire Protection Systems**

**6.1.0 Characteristics**

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Car parks on the second and lower below ground floors, and on the fourth floor above ground, if closed, or the fifth floor above ground, if open, and automatic car parks, must always be protected by a fixed automatic extinguishing system.

# Sprinkler systems are required in Italian schools for basements with a fire load greater than 30 kg/m<sup>2</sup>.

DECRETO MINISTERIALE 26 agosto 1992

## **Norme di prevenzione incendi per l'edilizia scolastica.**

### IL MINISTRO DELL'INTERNO

Vista la legge 27 dicembre 1941, n. 1570;

Vista la legge 13 maggio 1961, n. 469, artt. 1 e 2;

Vista la legge 26 luglio 1965, n. 966, art. 2;

Rilevata la necessità di emanare norme di prevenzione incendi per edilizia scolastica;

Viste le norme elaborate dal Comitato centrale tecnico scientifico per la prevenzione incendi di cui all'art. 10 del decreto del Presidente della Repubblica 29 luglio 1982, n. 577;

Visto l'art. 11 del citato decreto del presidente della Repubblica 29 luglio 1982, n. 577;

Decreta:

Sono approvate le norme di prevenzione incendi per l'edilizia scolastica contenute in allegato al presente decreto.

Il presente decreto sarà pubblicato nella *Gazzetta Ufficiale* della Repubblica italiana. È fatto obbligo a chiunque spetti di osservarlo e di farlo osservare.

*Allegato*

### NORME DI PREVENZIONE INCENDI PER L'EDILIZIA SCOLASTICA

#### **1. Generalità**

##### 1.0. *Scopo*

Le presenti norme hanno per oggetto i criteri di sicurezza antincendi da applicare negli edifici e nei locali adibiti a scuole, di qualsiasi tipo, ordine e grado, allo scopo di titolare l'incolumità delle persone e salvaguardare i beni contro il rischio di incendio.

Ai fini delle presenti norme si fa riferimento ai termini e definizioni generali di cui al decreto ministeriale 30 novembre 1983 (*Gazzetta Ufficiale* n. 339 del 12 dicembre 1983).

##### 1.1. *Campo di applicazione.*

Le presenti norme si applicano agli edifici ed ai locali di cui al punto 1.0 di nuova costruzione o agli edifici esistenti in caso di ristrutturazioni che comportino modifiche sostanziali, i cui progetti siano presentati agli organi competenti per le approvazioni previste dalle vigenti disposizioni, dopo

l'entrata in vigore del presente decreto. Si intendono per modifiche sostanziali lavori che comportino il rifacimento di oltre il 50% dei solai o il rifacimento strutturale delle scale o l'aumento di altezza.

Per gli edifici esistenti si applicano le disposizioni contenute nel successivo punto 13.

### *9.3. Impianti fissi di rilevazione e/o di estinzione degli incendi.*

Limitatamente agli ambienti o locali il cui carico d'incendio superi i 30 kg/m<sup>2</sup>, deve essere installato un impianto di rivelazione automatica d'incendio, se fuori terra, o un impianto di estinzione ad attivazione automatica, se interrato.

MINISTERIAL DECREE 26 August 1992

**Standard for the prevention of fire in educational establishments.**

THE MINISTER OF THE INTERIOR

With regard to the law of 27 December 1941, nr. 1570;

With regard to the law of 13 May 1961, nr. 469, Art. 1 and 2;

With regard to the law of 26 July 1965, nr. 966, Art. 2;

Recognising the need to issue a standard for the prevention of fire in educational establishments;

With regard to the standards prepared by the Central Technical Scientific Committee for the prevention of fire, of which Art. 10 of the decree of the President of the Republic of 29 July 1982, nr. 577;

With regard to Art. 11 of the cited decree of the President of the Republic of 29 July 1982, nr. 577;

Decrees:

The approved fire prevention standards for educational establishments are attached to the present decree.

The present decree will be published in the Official Gazette of the Italian Republic. This makes it obligatory for all to observe it and see that it is observed.

*Attachment*

STANDARD FOR FIRE PREVENTION  
IN EDUCATIONAL ESTABLISHMENTS

**1. General**

1.0. *Scope*

The objective of these standards is to establish fire safety in buildings and premises used as schools, of all types, order and grade, to preserve life and to safeguard property from fire.

At the end of this standard is a reference of general terms and definitions taken from the ministerial decree of 30 November 1983 (*Official Gazette* nr. 339 of 12 December 1983).

1.1. *Field of application.*

This standard is applicable to the buildings and premises in point 1.0 of new construction or to existing buildings that undergo major modifications. Plans are to be submitted to the competent authorities for the approvals foreseen by the compulsory measures, after the entry into force of this decree. By substantial modifications is meant works that comprise the refurbishment of more than 50% of the surface or a structural refurbishment of this scale or an increase in height.

For existing buildings the measures following point 13 apply.

9.3. *Fixed systems for the control and/or extinguishment of fires.*

Where an area or location has a fire load above 30 kg/m<sup>2</sup>, an automatic fire detection system must be installed if it is above ground, and an automatic extinguishing system if below ground.