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It is proposed that the Council of Ministers adopts the following draft provision:

Royal Decree adopting the Regulation on fire safety in industrial establishments

(Draft 30 May 2023)

The purpose of this Royal Decree is to review the regulatory framework relating to fire protection by adopting a new Regulation on fire safety in industrial establishments (RSCIEI) which repeals and replaces the previous one, adopted by Royal Decree 2267/2004 of 3 December.

The current 2004 regulation aimed to achieve a sufficient degree of safety in the event of fires in establishments and installations for industrial use. To this end, the requirements that must be met by these establishments are established, in order to prevent the occurrence of fires, or if this is not possible, to limit their spread and to make it possible to extinguish them, minimising the damage that the fire can cause to people, goods and the environment.

Given the evolution in both the technique and the national and European regulatory framework, it is appropriate to review and update the requirements laid down in the aforementioned regulation in order to adapt it to the current needs and construction solutions, while at the same time aligning it with the rest of the product, installation and building regulations. In particular, as regards the European regulatory framework, provision should be made for Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products. It is also appropriate to envisage a number of national regulations, including the Fire Protection Facilities Regulation (RIPCI), adopted by Royal Decree 513/2017 of 22 May; as well as the Technical Building Code (CTE), adopted by Royal Decree 314/2006 of 17 March and amended several times, including Royal Decree 732/2019, of 20 December.

Consequently, it is necessary to adopt a new Regulation on fire safety in industrial establishments that regulates the conditions for establishing an adequate level of fire safety in industrial establishments horizontally and that is applicable in any sector of industrial activity.

Furthermore, this Royal Decree introduces amendments to Royal Decree 513/2017 of 22 May adopting the Regulation on Fire Protection Facilities. The purpose of this Regulation is to determine the conditions and requirements required for the design, installation/application, maintenance and inspection of the equipment, systems and components constituting active fire protection facilities. This Regulation is closely linked to the Fire Safety Regulation in industrial establishments, and the requirements of both must be aligned. It should be noted that Royal Decree 513/2017 of 22 May repealed and replaced the previous regulation adopted by Royal Decree 1942/1993 of 5 November and entailed a full and comprehensive update of that text, adapting to the development of the technique, introducing a greater



degree of detail in its provisions and considering new types of equipment and systems. With regard to this Regulation, this Royal Decree is limited to amending some of its paragraphs in order to improve, adapt and update its content, in accordance with the needs that have been identified.

In addition, amendments have been made to the Basic Document DB-SI 'Safety in the event of fire' of the Technical Building Code, adopted by Royal Decree 314/2006 of 17 March, with the aim of seeking better complementarity and coordination with the fire safety regulations in industrial establishments. The two provisions are to some extent complementary, since one sets out aspects relating to the fire safety of industrial establishments, and the other lays down equivalent requirements in non-industrial buildings. For this reason, amendments are made to the Basic Document DB-SI 'Safety in the event of fire' of the Technical Building Code that will improve the aforementioned complementarity.

Amendments are also made to the Order of the Ministry of Industry and Energy of 27 July 1999 determining the conditions to be met by fire extinguishers installed in vehicles for the transport of persons or goods. This order establishes the minimum number and minimum classification of extinguishers to be carried by vehicles required in accordance with the General Vehicle Regulation. As mentioned in that order, what is prescribed in that order is mandatory, without prejudice to what might be laid down in other specific regulations. It proves that under the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), which is mandatory for both domestic and international transport, vehicles for the transport of dangerous goods are required to carry a specific allocation of firefighting equipment, defined in accordance with other criteria. Therefore, in order to facilitate compliance by these vehicles both with the General Vehicle Regulation, adopted by Royal Decree 2822/1998 of 23 December, and, where appropriate, with the aforementioned ADR Agreement, it has been considered appropriate to amend the requirements for extinguishers that may be required for goods vehicles in general.

In addition, amendments are made to the Supplementary Technical Instructions to the Safety Regulation for refrigeration facilities, adopted by Royal Decree 552/2019 of 27 September, with the aim of improving and updating its content in several aspects that have been deemed appropriate.

Lastly, a new provision is introduced in Royal Decree 2200/1995 of 28 December adopting the Regulation on Infrastructure for Quality and Industrial Safety, to expressly indicate that, for industrial products, the information and documentation that must accompany them (such as the contact details of economic actors or instructions) must be provided, at the least, in Spanish.

The content of this Royal Decree is adopted within the framework of industrial safety, in accordance with the provisions of Law 21/1992, of 16 July, on Industry. It should be noted that this law not only provides for industrial safety regulations, but also defines the framework within which industrial safety must be developed, establishing the necessary instruments for its implementation, in accordance with the competences of the various public administrations. Thus, Article 12.5 of the Law on Industry stipulates that the Industrial Safety Regulations at the state level shall be adopted by the Government of the Nation, without prejudice to the fact that the Autonomous Communities, with legislative competence over industry, may introduce additional requirements on the same matters in the case of installations located on their territory.

At the same time, as regards buildings where industrial establishments may be located, the Regulation on fire safety in industrial establishments also develops the basic requirement of the building 'Safety in the event of fire', set out in Article 3.1.b(2) of Law 38/1999, of 5 November, on Building Management. Similarly, the amendment of the Basic Document DB-SI of the Technical Building Code is also adopted on the basis of the aforementioned Law 38/1999 of 5 November.

This Royal Decree is issued under the provisions of Article 149.1.13 of the Spanish Constitution, which confers on the State exclusive powers on the basis and coordination of the general planning of



economic activity, without prejudice to the competences of the Autonomous Communities in matters of industry.

This Regulation has the character of basic regulations and contains provisions of a markedly technical nature, so a law is not the ideal instrument for its establishment and its approval is justified by Royal Decree.

At the draft stage, this Royal Decree was submitted to the public hearing and information procedure prescribed by Government Law 50/1997 of 27 November, as well as the procedure for the provision of technical standards and regulations and of regulations relating to the information society, regulated by Royal Decree 1337/1999 of 31 July for the purposes of complying with the provisions of Directive (EU) 2015/1535 of the European Parliament and of the Council of 9 September 2015, laying down a procedure for the provision of information in the field of technical regulations and of rules on Information Society services. Furthermore, this Royal Decree has been reviewed by the Industrial Safety Coordination Committee, as stipulated in Article 18(3)(a) of Law 21/1992, of 16 July, on Industry. Lastly, with regard to the amendment of the Order of 27 July 1999, this provision has been informed by the Standing Committee for the Coordination of the Transport of Dangerous Goods.

By virtue of its proposal, on the proposal of the Minister for Industry, Trade and Tourism and the Minister for Transport, Mobility and the Urban Agenda, with the prior approval of the Minister of Finance and the Civil Service, in agreement with the Council of State and after deliberation of the Council of Ministers at its meeting on XX XX XXXX,

THE FOLLOWING IS DECREED:

Single article. *Adoption of the Regulation*

The Regulation on fire safety in industrial establishments and its annexes, which are inserted below, are hereby adopted.

First additional provision. *Enforcement regime for the Fire Safety Regulation in industrial establishments to existing industrial establishments prior to its entry into force*

1. Industrial establishments already in existence prior to the entry into force of this Regulation shall not necessarily have to adapt to the new requirements, continuing to be governed by the regulations that were previously applicable to them, except in the areas indicated in the following paragraphs.

2. The provisions of Article 12(1), (2) and (3) relating to operation and maintenance; Chapter IV 'Inspections'; Chapter V, 'Action in the event of fire' and Chapter VI, 'sanctions regime'; they shall apply from the entry into force of the Regulation to all industrial establishments, regardless of whether they are new or existing prior to the Regulation.

3. With regard to Chapter IV, 'Inspections', industrial establishments prior to this Regulation shall carry out periodic inspections on the basis of the following considerations:

a) The industrial establishments that were built or implemented in accordance with Royal Decree 2267/2004, of 3 December, adopting the Regulation on fire safety in industrial establishments, which already provided for the existence of periodic inspections, must adapt the content and periodicity of these inspections to the provisions of Article 13 of this Regulation. In these cases, the control body must take into account that the construction requirements and facilities of these establishments are those established by Royal Decree 2267/2004 of 3 December.



b) Industrial establishments that were built prior to Royal Decree 2267/2004, of 3 December, must carry out periodic inspections, at least every five years, limiting their content to equipment and active fire protection systems, using the inspection methodology set out in Article 22 of the Fire Protection Facilities Regulation.

c) Exempt from the periodic inspections referred to in points (a) and (b) are industrial establishments whose weighted and corrected fire load density (Q_s), calculated according to Annex I, does not exceed 42 MJ/m^2 , provided that their built surface area is less than or equal to 120 m^2 and complying with Article 5(2) of the Regulation.

4. The remaining requirements of the Regulation shall apply only to those cases referred to in Article 2(2).

In the case of reforms or changes to existing establishments which do not require the adaptation of the establishment to this Regulation in accordance with Article 2(2), these cannot prejudice pre-existing security conditions, where these are less stringent than those provided for in this Regulation.

Second additional provision. *Mutual recognition*

Products lawfully placed on the market in another Member State of the European Union, in Türkiye, or originating in a State of the European Free Trade Association signatory to the Agreement on the European Economic Area and lawfully placed on the market therein shall be deemed to be in conformity with this Regulation, provided that they guarantee a level equivalent to that required by this Regulation in terms of their safety and the use for which they are intended. Application of this provision is subject to Regulation (EU) No 2019/515 of the European Parliament and of the Council of 19 March 2019 on the mutual recognition of goods lawfully marketed in another Member State and repealing Regulation (EC) No 764/2008.

First transitional provision. *Enforcement regime for industrial establishments under construction at the time of entry into force of this Royal Decree*

This Regulation shall not compulsorily apply to industrial establishments undergoing construction work, extension, alteration, refurbishment or renovation upon the entry into force of this Royal Decree, provided that their construction is completed and they are put into service within four years from the entry into force of this Royal Decree.

Nor shall the regulations compulsorily apply to industrial establishments that have applied for the municipal building permit for their construction work, extension, alteration, refurbishment or renovation at the time of the entry into force of this Royal Decree. These works must begin within the maximum period of effectiveness of said permit, in accordance with its regulatory legislation, and, failing that, within nine months from the date of the granting of the said licence, and must complete their construction and be put into service within four years from the entry into force of this Royal Decree, with Royal Decree 2267/2004 of 3 December, approving the Safety Regulation in case of fires in industrial establishments applying in that case. Otherwise, projects must be aligned with this Regulation.

Second transitional provision. *Enforcement regime for projects of equivalent safety or performance design as long as there are no control bodies in accordance with Article 10.3 of the Regulation*

As long as there are no control bodies authorised for the activities referred to in Article 10.3, the particular cases where it is chosen to use equivalent safety techniques or performance design shall



require prior resolution to be expressly decided by the competent industry body of the corresponding Autonomous Community or the cities of Ceuta and Melilla.

Together with the required documentation, the competent body may require, for the assessment of the equivalent level of effectiveness, a technical report issued by a qualified and independent body. In view of the arguments presented and the documentation submitted, the competent body may reject the application, request the amendment of the proposed solutions or grant authorisation.

Third transitional provision. *Control bodies authorised to carry out inspections prior to the entry into force of this Royal Decree*

The control bodies authorised to carry out inspections in accordance with Royal Decree 2267/2004, of 3 December, must adapt their authorisation to this regulation, having a maximum period of 18 months from its entry into force. For the duration of this transitional period, existing bodies may carry out periodic and initial inspections in accordance with this Regulation.

Fourth transitional provision. *Validity of periodic inspections carried out in accordance with Royal Decree 2267/2004 of 3 December*

Existing industrial establishments whose last periodic inspection, in accordance with Royal Decree 2267/2004 of 3 December, is still in force at the time of entry into force of this regulation, must carry out the following periodic inspection within the maximum period set by the corresponding report of the last inspection, from which time they will be adapted to the new periodicities laid down in this Regulation.

Fifth transitional provision. *Implementation of the changes made to the Fire Protection Facilities Regulation*

The changes made to the fifth final provision to the Fire Protection Facilities Regulation, adopted by Royal Decree 513/2017, of 22 May, shall be subject to the following transitional periods:

1. New installations of equipment or systems, subject to new requirements.

Manufacturers, marketers and installers of products (equipment or systems) whose requirements have been modified, shall have a maximum period of two years, from the date of entry into force of this Royal Decree, to comply with the new requirements, as regards the products they manufacture, distribute or install. Likewise, changes regarding the design of the facilities and the references to UNE standards will have the same transitional period.

During this transitional period, both equipment and systems that meet the new requirements and those previously in force may be manufactured, placed on the market or installed.

For the particular case of Fixed firefighting systems in commercial kitchens, the adaptation time for manufacturers, marketers and installers shall be five years. During this transitional period, both the systems with the new certification and those that possess the previous technical assessments according to Article 5.3 may be installed, which in any case will be understood to expire five years after the entry into force of the Royal Decree.

2. Equipment or systems already installed in accordance with the previous regulations.

For equipment or systems already installed or with the date of application for a building permit, prior to the entry into force of this Royal Decree, or applying the transitional period laid down in section 1 above, only those new provisions relating to their maintenance and inspection shall



apply. Maintenance activities that have been modified in the regulations must first be carried out within a maximum period of one year, from the entry into force of this Royal Decree.

Sixth transitional provision. *Application of the amendments made to the Technical Building Code.*

The amendments to the Technical Building Code adopted by this Royal Decree shall not apply to works of new construction and those of extension, alteration, renovation or refurbishment of existing buildings that have requested the municipal permit for works at the entry into force of this Royal Decree. Such works shall begin within the maximum period of efficiency of said permit, in accordance with its governing regulations or, failing that, within six months of said permit being granted. Otherwise, the projects must be adapted to the amendments of the Technical Building Code adopted by this Royal Decree.

Sole repealing provision. *Repeal of regulations*

1. Royal Decree 2267/2004 of 3 December adopting the Regulation on fire safety in industrial establishments is repealed.

2. Likewise, any provisions of equal or lower rank that contradict the provisions of this Royal Decree are repealed.

First final provision. *Basic Nature and Powers*

This Royal Decree is of a basic nature and is issued under the provisions of Article 149(1)(13) of the Spanish Constitution, which confers on the State exclusive competence over the basis and coordination of the general planning of economic activity.

Second final provision. *Regulatory powers*

1. The person in charge of the Ministry of Industry, Trade and Tourism shall issue, within the scope of their powers, the necessary provisions to ensure the proper execution and development of this Royal Decree.

2. The person in charge of the Ministry of Industry, Trade and Tourism is empowered to amend and update the regulations adopted by this Royal Decree in order to adapt it to technical progress and the provisions of international or European law of a technical nature in this area.

Third final provision. *Implementing measures*

The Directorate-General for Industry and Small and Medium-sized Enterprises may draw up a non-binding technical guide for the practical application of the provisions of the regulation and the annexes adopted by this Royal Decree, which may provide clarifications on general concepts.

Fourth final provision. *UNE and other internationally recognised standards.*

1. Annex V to the Regulation on fire safety in industrial establishments includes a list of UNE and other internationally recognised standards, set out in full or in part, in order to facilitate state-of-the-art adaptation at all times. These standards are identified by their titles and numbering, including the year of publication.



2. When one or more standards vary in their year of publication or subsequent amendments thereto or new rules are published, they must be updated in the list of rules, by decision of the person in charge of the Directorate-General for Industry and Small and Medium-sized Enterprises, on which the date from which the use of the old edition of the standard will no longer have regulatory effect.

3. Where such a decision has not occurred, the publication of the subsequent standard to that in the list of standards shall also be deemed to comply with the regulatory conditions, provided that it does not modify basic criteria and is limited to updating tests or increasing the intrinsic safety of the corresponding material.

Fifth final provision. Amendment of the Regulation on fire protection installations, adopted by Royal Decree 513/2017 of 22 May.

The Regulation on fire protection installations, adopted by Royal Decree 513/2017 of 22 May, is amended as follows:

One. In Article 5, 'Accreditation of compliance with the safety requirements of fire protection products', the following new sections 5 and 6 are added:

'5. The requirements set out in Annex I to the Regulation, which are not related to products but address aspects relating to the design of facilities, must justify compliance with what is indicated therein by means of their respective projects, technical documentation and certificates of the company installing.

6. With regard to compliance with the design requirements referred to in section 5 above, the use of alternative technical solutions to those referred to in the UNE, EN and ISO standards referred to in Annex I shall be permitted provided that the minimum requirements set out in the text of that Annex and in the other applicable specific regulations are met. The application of these alternative solutions shall be carried out under the responsibility of the project executor and subject to the agreement of the operator, justifying documentary evidence that the solutions adopted have a level of safety at least equivalent to that obtained by the application of the applicable requirements. In addition, an independent third-party report must be annexed to the project, issued by a control body authorised for these tasks in accordance with Royal Decree 2200/1995 of 28 December, which positively validates the effectiveness and adequacy of these technical solutions.'

Two. Article 6 now reads:

'The mark of compliance with the standard or favourable technical assessment certificate of the suitability of fire protection equipment and systems shall be required when these are designed and manufactured as a single model for a given facility. However, before the entry into service of the equipment or system, a project is required signed by qualified technician, specifying its technical characteristics of design, operation, installation and maintenance, and demonstrating compliance with all the safety requirements required by this regulation, where appropriate by carrying out the corresponding tests. Along with the project, an independent third-party report must be annexed, issued by a control body authorised for these tasks in accordance with Royal Decree 2200/1995 of 28 December, which positively validates the effectiveness and adequacy of these features.'

Three. Article 9(2) shall read as follows:

'2. The following are exempt from the provisions of the previous section:



- a) Fire extinguishers, which must be fitted by installation companies of fire protection systems or by companies maintaining fire extinguishers. When the area of the establishment is not greater than 100 m² or is a single-family home, they can also be fitted by the user.
- b) Flame-retardant blankets, which must be fitted by companies that install or maintain fire protection systems. When the area of the establishment is not greater than 100 m² or is a single-family house, they can also be fitted by the user.
- c) Evacuation plans (situation drawings), which must be fitted by signage system installation companies or also by the user.
- d) Fire protection systems that are part of machines such as wind turbines, covered by Royal Decree 1644/2008 of 10 October, establishing the standards for the marketing and putting into service of machines, by which, they must be designed and manufactured in such a way as to avoid any risk of fire or overheating. Due to the above, the fire protection systems of these machines fall within its assessment of conformity and CE marking as a machine, under the responsibility of the manufacturer, and the conditions of installation, commissioning and maintenance are also established there. In any case, for extinguishers that may be present in these machines, they must comply with the product requirements applicable in this Regulation and their maintenance must be adapted to the specific conditions of the site, being at least monitored regularly by the operator to verify their correct condition and the operations listed in Table II of Annex II.'

Four. In Article 15(1)(f), second paragraph, the text 'portable extinguishers', is replaced with 'extinguishers'; and the text 'UNE 23120 on "Maintenance of portable fire extinguishers"', is replaced with 'UNE 23120 on "Maintenance of fire extinguishers"'

Five. In Article 20, 'Entry into service', the following new section 2 is added:

'2. The entry in service of installations consisting solely of the equipment referred to in Article 9(2) shall not be necessary.'

Six. In Article 22(1) on periodic inspections, the following paragraph is added at the end of the current text:

'The inspections shall be carried out in accordance with the procedures laid down in standard UNE 192005-2 in any way that does not contradict these regulations, or other specifications that provide an equivalent level of security to this regulation, or the equivalent protocol that each autonomous community has established.'

Seven. In Article 22(2), the following paragraph is added at the end of the current text:

'Such inspections shall also not be mandatory for places whose installations consist solely of the equipment referred to in Article 20(2) or emergency lighting systems, unless their specific regulations so require.'

Eight. In Annex I, Part 1, Heading 1 'Fire-detection and alarm systems', the following sentence is added at the end of section 1:

'The design, installation and placing into service of voice alarm systems shall be carried out in accordance with UNE 23007-32'. Additionally, in section 6, the following sentence is deleted: 'Electroacoustic systems for emergency services shall be in accordance with the provisions of UNE-EN 60849'.

Nine. In Annex I, Part 1, Heading 2 'Water Supply Systems for Firefighting Purposes', the following text is added at the end of that heading:



'In the absence of specific requirements, in water-supplied fire protection systems (such as equipped fire-hydrant systems (BIEs)), the pipes of such systems must comply with the requirements of UNE 23500 for the general distribution network. By way of derogation from the above, where specific requirements for their pipes (as in the case of sprinkler systems) are provided for in the corresponding heading for such systems, what is established therein shall prevail.'

Ten. In Annex I, Part 1, Heading 3 'Fire-hydrant systems', the following three new sections 4, 5 and 6 are added:

'4. Hydrants whose only intended use is the filling of trucks (those not intended for direct drive), may be connected to the public water supply network, without the need for tanks or pumping equipment, provided that it is capable of providing the required pressure and flow rate. Alternatively, in the case of deposits, their capacity shall be sized to ensure an autonomy of at least 60 minutes, unless otherwise provided for in the specific legislation.

5. In the absence of any indication in the European standards setting the requirements for the hydrant operating mechanism, this mechanism shall consist of a nut in which the upper part of the axle will be threaded which transmits the axial movement to the moving element of the closure. This mechanism shall be operated by 25 mm x 25 mm square wrench for underground hydrants and 30 mm x 30 mm for column hydrants, rotating clockwise to close.

In the case of intermediate valves in the service pipe of the hydrant (at the junction between the distribution network and the hydrant connection piping), its opening mechanism must be capable of being activated using a 25x25 or 30x30 square wrench. These valves must preferably be in an open position to ensure that water reaches the hydrant, or otherwise, they must be accessible and signposted in the same way as the hydrants themselves, in order to allow them to be opened quickly.

The covers of hydrants underground must be easily visible and preferably painted red (RAL 3001 or equivalent), or have the inscription 'fires' or an equivalent text allowing the hydrant to be quickly identified. Also, the covers must be able to be opened by the Firefighting Services.

6. In the case of hydrants located on the public road whose management is assumed by the municipality ('municipal hydrants') or corresponding public administration, the product requirements, as well as the design of the installation, must comply with the provisions of this Regulation, however, with regard to the entry into service, maintenance operations and inspections, it will be those determined by the municipality or corresponding public administration.'

Eleven. In Annex I, Part 1, Heading 5 'Equipped fire-hydrant systems (BIEs)', section 3, the sentence 'BIEs shall always be located at a maximum distance of 5 m from the exits of the fire area, measured on an evacuation path, without constituting an obstacle to their use', with the following text:

'Where fire protection regulations require the installation of BIEs, they shall preferably be located close to doors or exits. A BIE shall always be located at a maximum distance of 5 m from each exit of the fire area, measured on an evacuation route, without constituting an obstacle to its use; except in cases where there is already another BIE located on another exit from that sector and it covers the entire area to be protected, or unless the specific legislation provides otherwise.'

Twelve. In Annex I, Part 1, Heading 5 'Equipped fire-hydrant systems (BIEs)', the first section of Part 4 is replaced with the following:

'4. For BIEs with semi-rigid hose or flat hose, the BIE network shall ensure, for at least one hour, the flow discharged by the two hydraulically most unfavourable (unless there is only one



BIE in the network, in which case it applies only to the network), complying with the following conditions:

- a) For BIEs with semi-rigid hose (25 mm), this must provide a minimum flow rate of 85 litres/minute, which in the case of K=42 implies having a minimum pressure at the inlet of the BIE of 4 bar (400 kPa) measured in the manometer with the water flow completely open and spear tip in compact jet position. (Note: This type of BIE is designed to allow non-specialists immediate and effective intervention on the start of a fire, pending, if necessary, other more powerful measures).
- b) For BIE with flat hose (45 mm), this must provide a minimum flow rate of 160 litres/minute, which in the case of K=85 implies having a minimum pressure at the inlet of 3.5 bar (350 kPa) measured in the manometer with the water flow completely open and spear tip in compact jet position. (Note: This type of BIE is capable of providing a superior flow rate, but for its use more training is required).
- c) With regard to the maximum pressure, this shall be conditioned by the technical characteristics of the system (maximum service pressure) and by the manoeuvrability of the hoses during use. Consequently, the maximum pressure at the inlet of the BIE with semi-rigid hose or flat hose shall not exceed 9 bar (900 kPa) measured in the pressure gauge with the water flow completely open and spear tip in compact jet position.
- d) The above pressure and flow requirements must be met in all BIEs in the system.'

Thirteen. In Annex I, Part 1, Heading 6 'Dry Riser Systems', point (a) of subsection 1 is replaced with the following:

'a) Water supply on the façade or in an area easily accessible to the Fire Service, with the indication "FOR USE BY FIRE FIGHTERS ONLY", equipped with Siamese connection, built-in keys and 70 mm fittings, with a 25 mm cover and petcock.'

Fourteen. In Annex I, Part 1, Heading 6 'Dry Riser Systems', the first paragraph of section 3 is replaced with the following text:

'3. Each building will have the number of dry risers sufficient so that the maximum route to them, following evacuation routes, is less than 60 m. Each riser, ascending or descending, shall have its independent outlet in the external wall, or in an area easily accessible to Firefighting Services.'

Fifteen. In Annex I, Part 1, Heading 6 'Dry riser systems', section 5 is replaced with the following text:

'5. The dry riser system shall be marked, as indicated in Part 2 of Annex I to this Regulation, with the text "FOR USE BY FIRE FIGHTERS ONLY". The signage shall be placed immediately next to or inscribed on the door of the dry riser system. In addition, on the inlets, the floors or areas that each outlet serves will be identified, as well as the maximum service pressure. Such additional information may be placed on the signage itself or inside the cabinet in such a way that it is protected and visible when it is opened.'

Sixteen. In Annex I, Part 1, Heading 11 'Fixed firefighting systems using gaseous extinguishing agents', the following paragraph in section 2:

'The design and conditions of its installation shall be in accordance with UNE-EN 15004-1. This standard shall be applied jointly, according to the extinguishing agent used, with the standards of the UNE-EN 15004 series. Technologies not set out in these standards shall be designed in accordance with international standards (ISO, EN) that regulate the application of these technologies, while a national implementing standard is not available.'

is replaced with the following:



'The design and conditions of its installation shall be in accordance with UNE-EN 15004-1 or UNE ISO 6183, depending on the extinguishing agent. If the standard UNE-EN 15004-1 is used, it shall be applied jointly, according to the extinguishing agent used, with the standards of the UNE-EN 15004 series.'

Seventeen. In Annex I, Part 1, Heading 12 'Fixed firefighting systems Using Condensed Aerosols', section 2 is replaced with the following:

'2. These systems must be designed according to UNE-EN 15276-2 and their components must be marked in accordance with UNE-EN 15276-1 according to Article 5.2 of this Regulation.'

Eighteen. In Annex I, Part 1, a new heading 16 is added as follows:

'16. Fixed firefighting systems in commercial kitchens

1. Automatic fixed firefighting systems in commercial kitchens are firefighting systems designed specifically for such locations and are commonly installed, for example, in restaurants, hotels and hospitals. These systems will need, before installation, to be certified in accordance with the provisions of Article 5.2 of this Regulation, in order to justify compliance with the provisions of standard UNE-EN 17446. Likewise, the conditions of their design and installation shall be in accordance with this standard.

2. The operation of these systems may be based, in whole or in part, on any of the following systems, depending on the technology and extinguishing agents used:

- a) Fixed firefighting systems using automatic sprinklers and water spray.
- b) Fixed firefighting systems using water mist.
- c) Fixed firefighting systems using foam.
- d) Fixed firefighting systems using powder.
- e) Fixed firefighting systems using gaseous extinguishing agents.
- f) Fixed firefighting systems using condensed aerosols.
- g) Fixed systems using other technologies and extinguishing agents, such as aqueous chemical agents, which consist mainly of containers for aqueous chemical agents, detection and activation devices, operating control equipment (manual, electrical or pneumatic), distribution pipes and discharge nozzles.

3. Depending on the above, the components that integrate the fixed firefighting systems in commercial kitchens, must comply with the requirements that apply to them in each case. Specific requirements for each component may be detailed in this Regulation or elsewhere, such as in European directives or regulations relating to CE marking. In the case of systems whose components do not have specific requirements, the assessment of those components shall be included in the certification of the complete system required by section 1 of this heading.

4. Manual firing and stop mechanisms shall be marked, as indicated in Part 2 of Annex I to this Regulation.

5. The installation and maintenance of these systems shall be carried out by undertakings qualified for the corresponding fixed system on which it is based, as referred to in section 2. In the case of using aqueous or other chemical agents, as long as there is no specific heading of companies for such systems, the installation and maintenance shall be carried out by companies qualified for one of the fixed firefighting systems indicated above. The maintenance



operations to be carried out for all these systems shall be that referred to in the tables in Annex II for fixed firefighting systems.'

Nineteen. In Annex I, Part 2 "LUMINESCENT SIGNAGE SYSTEMS", the following text is added at the end of section 1:

'The signs must be placed in such a way that they are clearly visible (position, size and type of sign), taking into account the characteristics of the place where they are to be located. Signage can also be reinforced by beacons and evacuation plans.

Non-luminescent signs may be used when their visibility is not impaired, as well as on buildings and public roads. For signs inside buildings, if they are not luminescent, they must be illuminated externally, and must be visible even in the event of a failure in the supply of normal lighting. When environmental conditions are not suitable to ensure sign is conserved (e.g. in adverse climates) the appropriate support material and protections should be used.

The signs must not contain symbols or inscriptions outside the message to be transmitted by the sign itself or that may make it difficult to read it, except those that are strictly necessary for the identification of the sign (as described in section 3 for photoluminescent signs), which must in no case invade the pictogram of the sign, must be located in the margins of the sign and must not occupy more than 3 % of its total surface.'

Twenty. In Annex I, Part 2 'LUMINESCENT SIGNAGE SYSTEMS', section 2, the sentence 'In the case of situational drawings ("you are here"), these shall be in accordance with UNE 23032, and shall represent the manual means of fire protection, by means of the signs defined in UNE 23033-1', is replaced with the following text:

'In the case of evacuation plans (formerly called situational drawings, "you are here"), they shall comply with UNE 23032 and represent the manual means of fire protection, by means of the signs defined in UNE 23033-1. Evacuation plans shall be visible even in the event of failure to supply normal lighting, with the same considerations as in section 1 above.'

Twenty-one. In Annex I, Part 2 'LUMINESCENT SIGNAGE SYSTEMS', section 4, the phrase '4. Where no national or European reference standard is available, electrically powered signage systems must have a favourable technical assessment of suitability for their intended use, as laid down in Article 5.3 of this Regulation. In any case they must meet the design requirements set out above', is replaced with the following text:

'4. Electrically powered signage systems must meet requirements similar to those required for emergency lighting, in terms of operation. In addition, they must comply with the sign design requirements set out in section 2 above.'

Twenty-two. The Appendix to Annex I 'Relation of UNE and other internationally recognised standards' is replaced with the following:

'Relation of UNE and other internationally recognised standards

DOCUMENT	TITLE
GENERAL	
UNE 157001:2014	General criteria for the formal preparation of documents constituting a technical project.
UNE 192005-2:2021	Procedure for regulatory inspection. Fire safety. Part 2: Fire protection installations
FIRE-DETECTION AND ALARM SYSTEMS	



DOCUMENT	TITLE
UNE-EN 54-1: 2011	Fire-detection and alarm systems. Part 1: Introduction.
EN 54-2:1997, adopted as UNE 23007-2:1998. EN 54-2:1997/A1:2006, adopted as UNE 23007-2:1998/1M:2008. EN 54-2:1997/AC:1999, adopted as UNE 23007-2:1998/erratum:2004.	Fire-detection and alarm systems. Part 2: Control and indicating equipment.
UNE-EN 54-3:2001 UNE-EN 54-3/A1:2002 UNE-EN 54-3:2001/A2:2007	Fire-detection and alarm systems. Part 3: Fire alarm devices. Acoustic devices.
EN 54-4:1997, adopted as UNE 23007-4:1998. EN 54-4/AC:1999, adopted as UNE 23007-4:1998/ erratum:1999. EN 54-4/A1:2003, adopted as UNE 23007-4:1998/1M:2003. EN 54-4:1997/A2:2007, adopted as UNE 23007-4:1998/2M:2007.	Fire-detection and alarm systems. Part 4: Power supply equipment.
UNE-EN 54-5:2017+A1:2019	Fire-detection and alarm systems. Part 5: Heat detectors. Point detectors.
UNE-EN 54-7:2019	Fire-detection and alarm systems. Part 7: Smoke detectors: Point detectors that work according to the principle of scattered light, transmitted light or ionisation.
UNE-EN 54-10:2002 UNE-EN 54-10:2002/A1:2007	Fire-detection and alarm systems. Part 10: Flame detectors. Point detectors.
UNE-EN 54-11:2001 UNE-EN 54-11:2001/A1:2007	Fire-detection and alarm systems. Part 11: Manual alarm buttons.
UNE-EN 54-12:2019	Fire-detection and alarm systems. Part 12: Smoke detectors. Line detectors using an optical light beam.
UNE-EN 54-13:2019+A1:2021	Fire-detection and alarm systems. Part 13: Assessment of the compatibility of a system's components
UNE 23007-14:2014	Fire-detection and alarm systems. Part 14: Planning, design, installation, entry into service, use and maintenance.
UNE-EN 54-16:2010	Fire-detection and alarm systems. Part 16: Voice control of alarm and indicator equipment.
UNE-EN 54-17:2007	Fire-detection and alarm systems. Part 17: Short circuit isolators.
UNE-EN 54-18:2007	Fire-detection and alarm systems. Part 18: Input/output devices.
UNE-EN 54-20:2007 UNE-EN 54-20:2007/AC:2009	Fire-detection and alarm systems. Part 20: Aspirating smoke detectors.
UNE-EN 54-21:2007	Fire-detection and alarm systems. Part 21: Alarm transmission equipment and failure warnings.
UNE-EN 54-23:2011	Fire-detection and alarm systems. Part 23: Fire alarm devices. Visual Alarm Devices (VAD).
UNE-EN 54-24:2009	Fire-detection and alarm systems. Part 24: Components of voice alarm systems. Speakers
UNE-EN 54-25:2009 UNE-EN 54-25:2009/AC:2012	Fire-detection and alarm systems. Part 25: Components that use radio links.
UNE-EN 14604:2006 UNE-EN 14604:2006/AC:2009	Autonomous smoke alarms.
UNE 23007-32:2020 (see notes)	Fire-detection and alarm systems - Part 32: Planning, design, installation,



DOCUMENT	TITLE
	entry into service, use and maintenance of voice alarm systems.
<p>Note 1: For the distances of the speakers to be installed when using the prescriptive method (section 6.5.3), these may be greater than those set out as a recommendation in that section provided that it is verified that the necessary level and quality of sound is reached with the number of devices installed.</p> <p>Note 2: As an alternative to UNE 23007-32, the use of UNE-EN 60849:2002, Electroacoustic systems for emergency services is also allowed.</p>	
WATER SUPPLY SYSTEMS FOR FIREFIGHTING PURPOSES	
UNE 23500:2021 (see note)	Water supply systems for firefighting purposes
<p>Note: The following considerations shall be taken for the application of UNE 23500:2021:</p> <p>1. Where the required supply category is I, the combinations of water sources and drive systems of Figures 11, 13, 15, 16 and 17 of Tables 4A and 4B in section 5.3. on Supply Classes are accepted, provided that the installation does not require a double supply in accordance with other regulations in force and none of the following conditions occur:</p> <ul style="list-style-type: none"> a) The length measured in a straight line from the point of supply and the system furthest from it exceeds 2 000 m. b) The total area protected with automatic sprinklers exceeds 250 000 m². <p>2. For combinations of water sources and drive systems and categories resulting from Tables 4A and 4B of section 5.3. on Supply Classes, the Type 1 public use network may be considered as superior supply class and may be used for Category II supplies.</p> <p>3. References to 'Hydrants' contained in standard UNE 23500, for those whose only intended use is the filling of lorries (those not intended for direct flow), shall be considered category III and, therefore, the supply class of type 'BASIC' will be sufficient (tables 3, 4A and 4B of the said standard).</p>	
FIRE-HYDRANT SYSTEMS	
UNE-EN 14384:2006	Riser hydrants.
UNE-EN 14339:2006	Underground fire hydrants.
HOSES	
UNE 23091-1:1989	Drive hoses for firefighting. Part 1: Generalities.
UNE 23091-2A:1996	Drive hoses for firefighting. Part 2A: Flat flexible hose for light service, diameters 45 mm and 70 mm.
UNE 23091-2B:1981	Drive hoses for firefighting. Part 2B: Flat flexible hose for heavy service, diameters 25, 45, 70 and 100 mm.
UNE 23091-4:1990 UNE 23091-4/1M:1994 UNE 23091-4/2M:1996	Drive hoses for firefighting. Part 4: Description of processes and apparatus for testing.
COUPLINGS	
UNE 23400-1:1998	Firefighting systems. 25 mm screw couplings.
UNE 23400-2:1998	Firefighting systems. 45 mm screw couplings.
UNE 23400-3:1998 UNE 23400-3:1999 ERRATUM	Firefighting systems. 70 mm screw couplings.
UNE 23400-4:1998 UNE 23400-4:1999 ERRATUM	Firefighting systems. 100 mm screw couplings.
UNE-EN 23400-5:1998 UNE 23400-5:1999 ERRATUM	Fire-fighting material. Screw couplings. Verification procedures.
FIRE EXTINGUISHERS	



DOCUMENT	TITLE
UNE-EN 2:1994 UNE-EN 2:1994/A1:2005	Fire classes.
UNE-EN 3-7:2004+A1:2008	Portable fire extinguishers. Part 7: Characteristics, performance requirements and test methods.
UNE-EN 3-10:2010	Portable fire extinguishers. Part 10: Requirements for the assessment of the conformity of a portable fire extinguisher in accordance with European Standard EN 3-7.
UNE 23120:2012	Maintenance of fire extinguishers.
UNE-EN 1866-1:2008	Mobile fire extinguishers. Part 1: Characteristics, behaviour and test methods.
EQUIPPED FIRE-HYDRANT SYSTEMS	
UNE-EN 671-1:2013	Fixed firefighting installations. Systems equipped with hoses. Part 1: Fire hydrants equipped with semi-rigid hoses.
UNE-EN 671-2: 2013	Fixed firefighting installations. Systems equipped with hoses. Part 2: Fire hydrants equipped with flat hoses.
UNE-EN 671-3: 2009	Fixed firefighting installations. Systems equipped with hoses. Part 2: Maintenance of fire hydrants equipped with semi-rigid and flat hoses.
FIXED FIREFIGHTING SYSTEMS USING AUTOMATIC SPRINKLERS AND WATER SPRAY	
UNE-EN 12845:2016+A1:2021	Fixed firefighting systems. Automatic sprinkler systems. Design, installation and maintenance.
UNE-EN 12259-1:2002 UNE-EN 12259-1:2002/A2:2005 UNE-EN 12259-1:2002/A3:2007	Fire protection. Fixed firefighting systems. Components for sprinkler systems and water spray. Part 1: Automatic sprinklers.
UNE-EN 12259-2:2000 UNE-EN 12259-2/A1:2001 UNE-EN 12259-2/AC:2002 UNE-EN 12259-2:2000/A2:2007	Fire protection. Fixed firefighting systems. Components for sprinkler systems and water spray. Part 2: Wet pipe alarm valve assemblies and delay chambers.
UNE-EN 12259-3:2001 UNE-EN 12259-3:2001/A1:2001 UNE-EN 12259-3:2001/A2:2007	Fire protection. Fixed firefighting systems. Components for sprinkler systems and water spray. Part 3: Alarm valve assemblies for dry pipe systems.
UNE-EN 12259-4:2000 UNE-EN 12259-4/A1:2001	Fire protection. Fixed firefighting systems. Components for sprinkler systems and water spray. Part 4: Hydromechanical alarms.
UNE-EN 12259-5:2003	Fire protection. Fixed firefighting systems. Components for sprinkler systems and water spray. Part 5: Water flow detectors.
UNE-EN 12259-9:2019	Fixed firefighting systems. Components for sprinkler systems and water spray. Part 9: Flood alarm valves.
UNE 23501:1988	Water spray fixed systems. Generalities.
UNE 23502:1986	Water spray fixed systems. System components.
UNE 23503:1989	Water spray fixed systems. Design and installations.
UNE 23504:1986	Water spray fixed systems. Acceptance tests.
UNE 23505:1986	Water spray fixed systems. Periodic testing and maintenance.
UNE 23506:1989	Water spray fixed systems. Diagrams, specifications and hydraulic calculations.
UNE 23507:1989	Water spray fixed systems. Automatic fire detection equipment.
FIXED FIREFIGHTING SYSTEMS USING WATER MIST	
UNE-EN 14972-1:2021 (replaces UNE CEN/TS 14972)	Fixed firefighting systems. Mist systems. Part 1: Design, installation, inspection and maintenance.
FIXED FOAM FIREFIGHTING SYSTEMS	



DOCUMENT	TITLE
UNE-EN 13565-1:2019	Fixed firefighting systems. Foaming systems. Part 1: Requirements and test methods for the components.
UNE-EN 13565-2:2018+AC:2019/AC:2021	Fixed firefighting systems. Foaming systems. Part 2: Design, construction and maintenance.
UNE-EN 1568-1:2019	Fire-extinguishing agents. Foam concentrates. Part 1: Specification for medium expansion foam concentrates for surface application in liquids not miscible with water.
UNE-EN 1568-2:2019	Fire-extinguishing agents. Foam concentrates. Part 2: Specification for high expansion foam concentrates for surface application in liquids not miscible with water.
UNE-EN 1568-3:2019	Fire-extinguishing agents. Foam concentrates. Part 3: Specification for low expansion foam concentrates for surface application in liquids not miscible with water.
UNE-EN 1568-4:2019	Fire-extinguishing agents. Foam concentrates. Part 4: Specification for low expansion foam concentrates for surface application in liquids miscible with water.
FIXED POWDER FIREFIGHTING SYSTEMS	
UNE-EN 12416-1:2001 + A2:2008.	Fixed firefighting systems. Powder firefighting systems. Part 1: Specifications and test methods for the components.
UNE-EN 12416-2:2001 + A1:2008.	Fixed firefighting systems. Powder firefighting systems. Part 2: Design, construction and maintenance.
UNE-EN 615:2009	Fire protection. Fire-extinguishing agents. Specifications for extinguishing powders (excluding class D powders).
FIXED FIREFIGHTING SYSTEMS USING GASEOUS AGENTS	
UNE-EN 15004-1:2019	Fixed firefighting systems. Gaseous agent firefighting systems. Part 1: Design, installation and maintenance.
UNE-EN 15004-2:2021	Fixed firefighting systems. Gaseous agent firefighting systems. Part 2: Physical properties and design of firefighting systems using gaseous agents with FK-5-1-12.
UNE-EN 15004-3:2009	Fixed firefighting systems. Gaseous agent firefighting systems. Part 3: Physical properties and design of firefighting systems using gaseous agents with HCFC, mixture A.
UNE-EN 15004-4:2021	Fixed firefighting systems. Gaseous agent firefighting systems. Part 4: Physical properties and design of firefighting systems using gaseous agents with HFC 125.
UNE-EN 15004-5:2021	Fixed firefighting systems. Gaseous agent firefighting systems. Part 5: Physical properties and design of firefighting systems using gaseous agents with HFC 227 ea.
UNE-EN 15004-6:2021	Fixed firefighting systems. Gaseous agent firefighting systems. Part 6: Physical properties and design of firefighting systems using gaseous agents with HFC 23.
UNE-EN 15004-7:2018	Fixed firefighting systems. Gaseous agent firefighting systems. Part 7: Physical properties and design of firefighting systems using gaseous agents with IG-01.
UNE-EN 15004-8:2018	Fixed firefighting systems. Gaseous agent firefighting systems. Part 8: Physical properties and design of firefighting systems using gaseous agents with IG-100.
UNE-EN 15004-9:2018	Fixed firefighting systems. Gaseous agent firefighting systems. Part 9: Physical properties and design of firefighting systems using gaseous agents with IG-55.



DOCUMENT	TITLE
UNE-EN 15004-10:2018	Fixed firefighting systems. Gaseous agent firefighting systems. Part 10: Physical properties and design of firefighting systems using gaseous agents with IG-541.
UNE-ISO 6183:2015	Fire protection equipment. Carbon dioxide firefighting systems for use in buildings. Design and installation.
UNE-EN 12094-1:2004	Fixed firefighting systems – Components for gaseous agent firefighting systems – Part 1: Test requirements and methods for automatic and electrical control and delay devices.
UNE-EN 12094-2:2004	Fixed firefighting systems. Components for gaseous agent firefighting systems. Part 2: Test requirements and methods for non-electric automatic control and delay devices.
UNE-EN 12094-3:2003	Fixed firefighting systems. Components for gaseous agent firefighting systems. Part 3: Test requirements and methods for manual firing and stop devices.
UNE-EN 12094-4:2005	Fixed firefighting systems. Components for gaseous agent firefighting systems. Part 4: Test requirements and methods for devices and their actuators.
UNE-EN 12094-5:2007	Fixed firefighting systems – Components for gaseous agent firefighting systems – Part 5: Test requirements and methods for high and low pressure directional valves and their actuators.
UNE-EN 12094-6:2007	Fixed firefighting systems – Components for gaseous agent firefighting systems – Part 6: Test requirements and methods for non-electric deactivation devices.
UNE-EN 12094-7:2001 UNE-EN 12094-7/A1:2005	Fixed firefighting systems – Components for gaseous agent firefighting systems – Part 7: Requirements and test methods for diffusers for CO2 systems.
UNE-EN 12094-8:2007	Fixed firefighting systems. Components for gaseous agent firefighting systems. Part 8: Requirements and test methods for connectors.
UNE-EN 12094-9:2003	Fixed firefighting systems – Components for gaseous agent firefighting systems – Part 9: Requirements and test methods for special fire detectors.
UNE-EN 12094-10:2004	Fixed firefighting systems. Components for gaseous agent firefighting systems. Part 10: Test requirements and methods for pressure controllers and manometers.
UNE-EN 12094-11:2003	Fixed firefighting systems – Components for gaseous agent firefighting systems – Part 11: Test requirements and methods for mechanical weighing devices.
UNE-EN 12094-12:2004	Fixed firefighting systems – Components for gaseous agent firefighting systems – Part 12: Test requirements and methods for pneumatic alarm devices.
UNE-EN 12094-13:2001 UNE-EN 12094-13/AC:2002	Fixed firefighting systems – Components for gaseous agent firefighting systems – Part 13: Test requirements and methods for check valves and anti-return valves.
FIREFIGHTING SYSTEMS USING FIXED CONDENSED AEROSOLS	
UNE-EN 15276-1:2022	Fixed firefighting systems. Condensed aerosol firefighting systems. Part 1: Test requirements and methods for components
UNE-EN 15276-2 :2022	Fixed firefighting systems. Condensed aerosol firefighting systems. Part 2: Design, installation and maintenance.
SMOKE AND HEAT CONTROL SYSTEMS	
UNE 23584:2008	Fire safety. Smoke and heat control systems (SHEVS). Requirements for



DOCUMENT	TITLE
	the installation, entry into service and periodic maintenance of SHEVs.
UNE 23585:2017	Fire safety. Smoke and heat control systems. Requirements, calculation and design methods for temperature control systems and smoke exhaust systems projecting in case of stationary fire.
UNE-EN 12101-1:2007 UNE-EN 12101-1:2007/A1:2007	Smoke and heat control systems. Part 1: Specification for smoke barriers.
UNE-EN 12101-2:2004	Smoke and heat control systems. Part 2: Specification for natural smoke and heat exhaust ventilators.
UNE-EN 12101-3:2016	Smoke and heat control systems. Part 3: Specifications for mechanical aerators extracting heat and smoke.
UNE-EN 12101-6:2006	Smoke and heat control systems. Part 6: Specification for pressure differential systems. Kits.
UNE-EN 12101-7:2013	Smoke and heat control systems. Part 7: Smoke duct sections.
UNE-EN 12101-8:2015	Smoke and heat control systems. Part 8: Smoke control dampers.
UNE-EN 12101-10:2007	Smoke and heat control systems. Part 10: Power supplies.
FLAME RETARDANT BLANKETS	
UNE-EN 1869:2021	Flame retardant blankets.
FIXED FIREFIGHTING SYSTEMS IN COMMERCIAL KITCHENS	
UNE-EN 17446:2022	Firefighting systems in commercial kitchens. Design, documentation and testing requirements.
LUMINESCENT SIGNAGE SYSTEMS	
UNE-EN ISO 7010:2020	Graphic symbols. Colours and safety signs. Registered safety signs
UNE 23032:2015	Fire safety. Graphic symbols for use in project plans, self-protection plans and evacuation plans.
UNE 23033-1:2019	Fire safety. Safety signs. Part 1: Signs and beaconing of fire protection systems and equipment.
UNE 23035-2:2003	Fire safety. Photoluminescent signs. Part 2: Measurement of products at the place of use.
UNE 23035-4:2003	Fire safety. Photoluminescent signs. Part 4: General conditions. Measurement and classification.
MAINTENANCE RECORDS	
UNE 23580-1:2022	Fire safety. Records of maintenance of fire protection installations and equipment. Part 1: Generalities.
UNE 23580-2:2022	Fire safety. Records of maintenance of fire protection installations and equipment. Part 2: Fire-detection and alarm systems.
UNE 23580-3:2022	Fire safety. Records of maintenance of fire protection installations and equipment. Part 3: Water supply.
UNE 23580-4:2022	Fire safety. Records of maintenance of fire protection installations and equipment. Part 4: General network: hydrants and valves
UNE 23580-5:2022	Fire safety. Records of maintenance of fire protection installations and equipment. Part 5: Network of equipped fire hydrants.
UNE 23580-6:2022	Fire safety. Records of maintenance of fire protection installations and equipment. Part 6: Sprinkler systems.
UNE 23580-7:2005	Fire safety. Records of the review of fire protection facilities and equipment. Technical inspection for maintenance. Part 7: Foam systems
UNE 23580-8:2005	Fire safety. Records of the review of fire protection facilities and equipment. Technical inspection for maintenance. Part 8: Gas systems.



DOCUMENT	TITLE
UNE 23580-9:2022	Fire safety. Records of maintenance of fire protection installations and equipment. Part 9: Fire extinguishers.
UNE 23580-10:2022	Fire safety. Records of maintenance of fire protection installations and equipment. Part 10: Dry riser systems
UNE 23580-11:2022	Fire safety. Records of maintenance of fire protection installations and equipment. Part 11: Mist systems
UNE 23580-12:2023	Fire safety. Records of maintenance of fire protection installations and equipment. Part 12: Powder firefighting systems.
UNE 23580-13:2023	Fire safety. Records of maintenance of fire protection installations and equipment. Part 13: Condensed aerosols.
UNE 23580-14:2022	Fire safety. Records of maintenance of fire protection installations and equipment. Part 14: Temperature control and smoke evacuation systems.
UNE 23580-15:2022	Fire safety. Records of maintenance of fire protection installations and equipment. Part 15: Signage:
PNE 23580-16 (2023)	Records of the review of fire protection facilities and equipment. Technical inspection for maintenance. Part 16: Water spray systems

Note: In the case of standards referred to in the Official Journal of the European Union for the application of harmonised product legislation according to European regulations or directives, such standards (reference and version) shall take precedence over those indicated in this table.'

Twenty-three. In Annex II, section 5, the sentence 'For the monitoring of the maintenance programmes for fire protection equipment and systems set out in Tables I, II and III, reports shall be drawn up which shall be in accordance with the UNE 23580 series of standards and contain at least the following information:', is replaced with the following:

'For the monitoring of the maintenance programmes for fire protection equipment and systems set out in Tables I, II and III, the documentation referred to in Article 17(e) shall be drawn up, consisting of a certificate indicating or referring to the general information, signed by a technical manager of the undertaking, and the checklists with details of the operations carried out must be annexed. For the preparation of these documents, the formats of minutes referred to in the series of standards UNE 23580 may be used, and these must be adapted to the provisions of this Annex, or another equivalent format. In any case, its minimum content shall include the following:'

Twenty-four. In Annex II, Part 1, Table I 'Quarterly and semi-annual maintenance schedule of active fire protection systems', the contents of the table are amended as follows: The row corresponding to 'Equipment or system: Equipped fire hydrants (BIE)', is worded as follows:

Equipment or system	Every	
	Three months	Six months
Equipped fire hydrants (BIE).	Verification of the signalling of the BIEs. Verification of the proper accessibility of the equipment. Verification, by reading the pressure gauge, of the pressure. Verification of all components (nozzle, valve, hose, etc.) verifying that they do not show apparent signs of damage and that they are in good condition.	



Twenty-five. In Annex II, Part 1, Table II 'Annual and Five-Year Maintenance Programme of Active Fire Protection Systems', the contents of the table are amended as follows: The row corresponding to 'Equipment or system: Fire-detection and alarm systems. Detectors', is worded as follows:

Equipment or system	Every	
	Year	Five years
Fire-detection and alarm systems. Detectors.	<p>Verification of the free space, under the point detector and in all directions, at least 500 mm.</p> <p>Verification of the condition of the detectors (fixing, cleaning, corrosion, exterior appearance).</p> <p>Individual test that all automatic detectors are operating according to the specifications of their manufacturers.</p> <p>Verification of the ability to reach and activate the sensor element inside the detector camera. Verification methods that do not damage or impair the performance of the detector should be used.</p> <p>The service life of the fire detectors shall be as established by the fire detector manufacturer. In the event that the manufacturer does not establish a service life, it shall be considered to be 10 years from its entry into service. Once their service life is exceeded, they will be replaced, unless it is verified that their operating state (reliability, sensitivity, response time and status of internal components) remains fit for service. This verification shall be carried out once its service life is exceeded and every five years successively, taking a representative sample of units. In the case of detectors installed prior to the publication of Royal Decree 513/2017 of 22 May, and which do not have a service life set by their manufacturer, this verification shall be carried out after they have been in operation for 10 or more years.</p>	

Twenty-six. In Annex II, Part 1, Table II 'Annual and Five-Year Maintenance Programme of Active Fire Protection Systems', in row marked 'Equipment or System: Equipped fire hydrants (BIEs)', the paragraph 'The service life of fire hoses shall be that established by the fire hose manufacturer after which the fire hose shall be replaced. Where the manufacturer does not establish a service life, it shall be considered to be 20 years', is replaced with the following text:

'Fire hoses shall be replaced at least every 20 years from their entry into service, unless their manufacturer certifies for them longer durability'.

Twenty-seven. In Annex II, Part 1, Table II 'Annual and Five-Year Maintenance Programme of Active Fire Protection Systems', in row marked 'Equipment or System: Fixed firefighting systems', the following sentence 'For fixed gaseous extinguishing agent flooding systems, check the watertightness of the protected room under discharge conditions' is replaced with the following text:

'For fixed total flooding systems of gaseous extinguishing agents, check the tightness of the protected room. To this end, it must be checked whether there have been penetrations or other changes in the protected space that may affect leakage or the performance of the extinguishing agent. This verification may be carried out by means of a visual check, without the need to carry out a sealing test under discharge conditions, provided that no works or changes have been made in the room that may have affected its tightness since the last test carried out. In the



visual check it will be checked that the room has not been modified, and in case of alterations, that they are documented and that they do not affect the tightness.'

Twenty-eight. In Annex II, Part 1, Table II 'Annual and Five-Year Maintenance Programme of Active Fire Protection Systems', in row marked 'Equipment or System: Fixed firefighting systems', the following sentence 'test installation under the conditions of receipt.' is replaced with the following text:

'In fixed gaseous firefighting systems, the carrying out of a watertight test of the protected room under discharge conditions for total flooding systems, as referred to in UNE-EN 15004-1, or UNE-ISO 6183.

In fixed firefighting systems using condensed aerosols, the carrying out of a watertight test of the protected room under discharge conditions, as indicated in UNE-EN 15276-2.'

Twenty-nine. In Annex II, Part 2 'Luminescent signs', the text 'The service life of photoluminescent signs shall be as determined by the manufacturer of the signs. In the event that the manufacturer does not establish a service life, it shall be considered to be 10 years. Once the service life has passed, they shall be replaced with specialised personnel of the manufacturer or a maintenance company, unless it is justified that the measurement on a representative sample, taking into account the date of manufacture and its location, carried out in accordance with UNE 23035-2, provides values not less than 80% of those prescribed by UNE 23035-4 at any given time. The service life of the photoluminescent sign shall be counted from the date of manufacture of the sign. The measurements allowing this service life to be extended shall be repeated every 5 years', is replaced with the following text:

'For photoluminescent signs, after 20 years from their manufacture they must be replaced unless it is justified that the measurement on a representative sample, in accordance with UNE 23035-2, provides values not less than 80% of those for which the sign was manufactured (according to UNE 23035-4). These measurements shall then be repeated every 10 years.'

Thirty. In Annex III, section 2(c), the sentence '1. Hold a university degree whose curriculum covers the subjects covered by this Regulation, for which it proves their qualification' is replaced with the following:

'1. Hold a university degree whose field of competence, legal powers or curriculum covers the subjects covered by this Regulation, for which it attests to their qualification.'

Sixth final provision. Amendment of the Basic Document DB-SI 'Safety in the event of fire' of the Technical Building Code, adopted by Royal Decree 314/2006, of 17 March.

The Basic Document DB-SI 'Safety in the event of fire', included in Part II of the Technical Building Code (CTE), adopted by Royal Decree 314/2006 of 17 March, is amended as follows:

One. In point I 'Subject matter' in the 'Introduction', note (1) is deleted.

Two. In section II 'Scope' in the 'Introduction', note (1) is deleted.

Three. Section III 'General criteria of application' in the 'Introduction' is amended as follows:

1. The following points 5, 6 and 7 are added after point 4:

'5 In buildings, *establishments* or areas for *storage use* compliance with basic safety requirements in the event of fire shall be performed in accordance with Table 1.1. 'Division conditions in fire areas' of Part SI 1 of this Basic Document and the



characterisation and building and equipment requirements set out in Annexes I, II, III and IV to the Regulation on safety in the event of fire in industrial establishments (RSCIEI). However, the occupancy of these buildings, *establishments* and areas will be calculated according to the occupancy density assigned by Table 2.1 'Occupancy density' of Part SI 3 of this Basic Document for use as archives and storage.

6 *Establishments* whose activity is the storage and warehouse rental service are considered to be for *storage use* for the purpose of applying this Basic Document. In any case, the fire sectors or areas of these establishments shall be classified as areas or sectors with an average level of intrinsic risk (NRI), sublevel 5, provided that they have a storage height equal to or less than 3 m and as areas or sectors with a high intrinsic risk level (NRI) if their storage height is greater than 3 m, and in that case their sublevel should be calculated in accordance with RSCIEI.

7. For the purposes of the application of this Basic Document, the public sales areas integrated in the establishments for *Commercial use*, where the public supply themselves with products, are not considered areas for *storage use* but areas for *Commercial use* regardless of their total fire load. Nor are areas for archiving open documents, integrated within offices in *Administrative* establishments, considered to be areas for *Storage use* regardless of their total fire load. However, in the case that these areas, both those for *Commercial use* and those for *Administrative use*, have a total fire load (Q_T), calculated according to Annex I to the RSCIEI equal to or greater than three million megajoules and a storage height greater than 5 m, compliance with the basic safety requirements in the event of fire shall be carried out by applying the requirements established by this Basic Document for these areas in accordance with their use, and in addition to the conditions arising from the characterisation and the constructive and equipment requirements set out in Annexes I, II, III and IV of the RSCIEI, provided that these conditions are more demanding than those arising from the application of this Basic Document.'

2. The numbering of current points 5, 6, 7 and 8 is replaced with 8, 9, 10 and 11 respectively.

Four. Part SI 1 'Internal spreading' is amended as follows:

1. In Table 1.1. 'Division conditions in fire areas', is replaced with the following:

'- Any area whose *planned use* is different and subsidiary to the main building or *establishment* in which it is integrated must constitute a different *fire area* when it exceeds the following limits:

Area for *residential housing* in any case.

Accommodation area ⁽¹⁾ or area for *Administrative, Commercial or Educational use* whose built surface area exceeds 500 m²

Area for public use whose occupation exceeds 500 people.

Parking area whose built surface area exceeds 100 m².⁽²⁾ Any connection with areas for other uses must be via *firefighting lobbies*.'

is replaced with the text:

'- Any area whose *planned use* is different and subsidiary to the main building or *establishment* in which it is integrated must constitute a different *fire area* when it exceeds the following limits:



- Premises of electricity meters and general distribution tables	In any case			
- Processing centre				
- appliances with dry or liquid dielectric insulation with flash point greater than 300°C	In any case			
- appliances with dielectric insulation with flashpoint not exceeding 300°C and installed power P: total	$P \leq 2\,520$ kVA	$2\,520 < P < 4\,000$ kVA	$P > 4\,000$ kVA	
in each transformer	$P \leq 630$ kVA	$630 < P \leq 1\,000$ kVA	$P > 1\,000$ kVA	
- Lift machinery room	In any case			
- Generator set room	In any case			
Residential Housing				
- Storage rooms ⁽⁴⁾	$50 < S \leq 100$ m ²	$100 < S \leq 500$ m ²	$S > 500$ m ²	
Healthcare				
- Warehouses for pharmaceutical and clinical products	$100 < V \leq 200$ m ³	$200 < V \leq 400$ m ³	$V > 400$ m ³	
- Sterilisation premises and attached warehouses			In any case	
- Clinical laboratories	$V \leq 350$ m ³	$350 < V \leq 500$ m ³	$V > 500$ m ³	
Administrative				
- Printing, reprography and attached premises, such as paper or publication stores, binding, etc. ⁽⁶⁾	$100 < V \leq 200$ m ³	$200 < V \leq 500$ m ³	$V > 500$ m ³	
Public residential				
- Cloakrooms and premises for checking baggage	$S \leq 20$ m ²	$20 < S \leq 100$ m ²	$S > 100$ m ²	
Commercial				
- Warehouses in which the <i>density of the weighted and corrected fire load</i> (Q_s) provided by stored products is ⁽⁵⁾	$425 < Q_s \leq 850$ MJ/m ²	$850 < Q_s \leq 3\,400$ MJ/m ²	$Q_s > 3\,400$ MJ/m ²	
The built surface area of the premises thus classified shall not exceed the following:				
- in enclosed areas not below the exit floor of the building				
with an automatic extinguishing installation	$S < 2\,000$ m ²	$S < 600$ m ²	$S < 25$ m ² and evacuation height < 15 m	
without an automatic extinguishing installation	$S < 1\,000$ m ²	$S < 300$ m ²	not allowed	
- in enclosed areas below the exit floor of the building				
with an automatic extinguishing installation	< 800 m ²	not allowed	not allowed	
without an automatic extinguishing installation	< 400 m ²	not allowed	not allowed	
Public use				
- Workshop or warehouse of decorations, costumes, etc.		$100 < V \leq 200$ m ³	$V > 200$ m ³	

(4)



For the determination of the installed power, only appliances directly intended for food preparation and capable of causing ignition shall be considered, incluidos los asadores de pollos, kebab, etc., pero excluidos, en usos distintos de Hospitalario y Residencial Público, los aparatos protegidos por un sistema automático de extinción, ya sea de forma obligatoria.

Fryers and bratt pans shall be computed at the ratio of se les debe asignar 1 kW per litre of capacity, regardless of the power they have.

In uses other than *healthcare* and *public residential use*, kitchens whose appliances are protected by an automatic extinguishing system are not considered to be special risk premises, although even in this case the provisions of note (2) apply to them. Chapter 1 of Part SI4 of this DB stipulates that such a system must exist when the installed power exceeds 50 kW.

(2) Smoke extraction systems from kitchens which, according to the provisions of this DB SI, are to be classified as special risk premises must also meet the following special conditions:

- The hoods must be separated by at least 50 cm from any material other than A1.
- The ducts must be independent of any other extraction or ventilation and exclusive to each kitchen. They must have records for inspection and cleaning for changes of direction with angles greater than 30° and every 3 m maximum horizontal section. Ducts that run through the interior of the building, as well as those that run through façades less than 1.50 m away from areas of the building that are not at least EI 30 or balconies, terraces or openings shall have a classification EI

There must be no fire gates inside these types of ducts, so their passage through *fire* partitioning elements must be resolved in the manner indicated in section 3 of this Part.

- Filters must be separated from heat bulbs more than 1.20 m if they are grill or gas type, and more than 0.50 m if they are of other types. They must be easily accessible and detachable for cleaning, have an inclination greater than 45° and have a grease collection tray that leads them to a closed container whose capacity should be less than 3 l.
- The fans shall meet the specifications of the standard UNE-EN 12101-3: 2016 'Specifications for mechanical smoke and heat extractors.' and shall have an F₄₀₀ 90rating.

- (3) Toilet areas do not count for the purpose of calculating the built surface area.
- (4) Storage rooms that are linked to housing in the buildings in which it is integrated are considered. It includes those that connect to areas for use as garages of housing buildings.
- (5) Public areas for sales are not classified as special risk premises. The determination of Q_s must be carried out in accordance with Annex I to the RSCIEI. Premises whose total fire load Q_T calculated according to Annex I to the RSCIEI is 3 x 10⁶ MJ, shall be considered areas for *storage*.
- (6) In the case that these premises have more than 500 m³ and a total fire load Q_T calculated according to RSCIEI Annex I that is equal to or greater than 3 x 10⁶ MJ, shall be considered areas for *storage*.

Five. Part SI 3 'Occupant evacuation' is amended as follows:

1. In Table 2.1 'Occupancy density ⁽¹⁾', the following text:

'Parking ⁽²⁾	Linked to an activity subject to schedules: commercial, shows, office, etc.	15
	In other cases	40'

is replaced with the text:

'Parking ⁽²⁾	Linked to an activity subject to schedules: commercial, shows, office, etc.	15
	In other cases, including parking lots for vehicles intended for the transport of persons and the transport of goods	40'

Six. Annex A 'Terminology' is amended as follows:

1. The following text:



'Floor exit:

It is one of the following elements, which may be located either on the floor in question or on another floor:

1 The beginning of an unprotected staircase leading to a floor with an *exit from the building*, provided that the area of the gap of the top slab does not exceed the surface area on the floor of the staircase by more than 1.30 m². However, when in the sector containing the staircase, the floor in question or any other lower floor connects to other floors via gaps other than those of the stairs, the beginning of the staircase mentioned above cannot be considered a *floor exit*.

2 The start of a compartmentalised staircase such as fire areas, or an access door to a *protected staircase*, to a *protected corridor* or to the *fire lobby* of an *especially protected staircase*.

In the case of a *floor exit* from a hospitalisation or intensive treatment area, those elements must have a surface area of at least 0.70 m² or 1.50 m², respectively, for each occupant. In the case of stairs, this surface area refers to that of the landing of the floor in question, its use being permitted for low-risk activities, such as waiting rooms, etc.

3 A gateway, through a *fire lobby*, to a different *fire area* on the same floor, provided that:

- the initial area has another *floor exit* that does not lead to the same alternative area.
- the alternative area has a surface area in circulation zones that is sufficient to accommodate the occupants of the initial area, at the rate of 0.5 m²/person, considering only those points located less than 30 m from the access to the sector. In the case of *hospital use* this area is determined according to the criteria indicated in point 2 above.
- the evacuation of the alternative area does not converge with that of the initial area in any other part of the building, except when it does so in a *minimum risk area*.

4 A *building exit*'

is replaced with the text:

'Floor exit:

It is one of the following elements, which may be located either on the floor in question or on another floor:

1 The start of a compartmentalised staircase such as fire areas, or an access door to a *protected staircase*, to a *protected corridor* or to the *fire lobby* of an *especially protected staircase*.

In the case of a *floor exit* from a hospitalisation or intensive treatment area, those elements must have a surface area of at least 0.70 m² or 1.50 m², respectively, for each occupant. In the case of stairs, this surface area refers to that of the landing of the floor in question, its use being permitted for low-risk activities, such as waiting rooms, etc.

2 A gateway, through a *fire lobby*, to a different *fire area* on the same floor, provided that:



- the initial area has another *floor exit* that does not lead to the same alternative area.
- the alternative area has a surface area in circulation zones that is sufficient to accommodate the occupants of the initial area, at the rate of 0.5 m²/person, considering only those points located less than 30 m from the access to the sector. In the case of *hospital use* this area is determined according to the criteria indicated in point 2 above.
- the evacuation of the alternative area does not converge with that of the initial area in any other part of the building, except when it does so in a *minimum risk area*.

3 A building exit'

2. The following text:

'Commercial use

Building or *establishment* whose main activity is the sale of products directly to the public or the provision of related services, including both stores and department stores, which usually constitute a single *establishment* with a single owner, such as shopping malls, markets, shopping galleries, etc.'

Is replaced with the text:

'Commercial use

Building, *establishment* or area whose main activity is the sale of products directly to the public or the provision of related services, including, both stores and department stores, which usually constitute a single *establishment* with a single owner, such as shopping centres, markets, shopping galleries, etc.'

3. The following term is incorporated:

'Storage use

Building or *establishment* intended primarily for the storage of materials or products. Areas primarily intended for the storage of materials or products provided that they have a total fire load (Q_T), calculated according to Annex I to the RSCIEI, that is equal to or greater than three million megajoules, are also considered to be for *storage use*. However, the special risk premises listed in Table 2.1 of Part SI 1 shall not be considered as areas for *storage use* except in the situations indicated in the table itself.'

Seventh final provision. Amendment of the Order of 27 July 1999 determining the conditions to be met by fire extinguishers installed in vehicles for the transport of persons or goods

The first, second and third sections of the Order of 27 July 1999 determining the conditions to be met by fire extinguishers installed in vehicles for the transport of persons or goods are worded as follows:

'One. Without prejudice to what may be laid down in other specific regulations, fire extinguishers to be installed in newly registered vehicles, and those for replacement in other vehicles that are required by



the General Vehicle Regulation to carry them, shall be of a portable and manual type and shall be the most suitable extinguishing agent for the characteristics of the vehicle, preferably dry dust or another agent that is suitable for use. These fire extinguishers must comply with Royal Decree 709/2015 of 24 July establishing the essential safety requirements for the marketing of pressure equipment and Royal Decree 513/2017 of 22 May adopting the Regulation on fire protection installations.

The classification of fire extinguishers is established in accordance with the UNE-EN 3-7 standard, in accordance with the Fire Protection Facilities Regulation, of which extinguishers must comply with all product requirements. On the other hand, the requirements of said Regulation regarding installation, entry into service, inspection or maintenance shall not apply to them. They must instead comply with the following requirements: Once installed, they must be monitored on a regular basis by the owner of the vehicle or another designated person, in order to verify their correct condition and in addition, the operations listed in Table II of Annex II to the Fire Protection Facilities Regulation should be carried out at least.

Two. The minimum number and minimum rating of the fire extinguishers to be fitted with a statutory vehicle shall be:

- a) Motor vehicle for the transport of persons:
 - Up to 9 seats (including the driver): One of class 5A/21B.
 - Up to 23 seats (including the driver): One of class 8A/34B.
 - More than 23 seats (including the driver): One of class 21A/113B.
- b) Motor vehicles and combinations of vehicles for the transport of goods and items:
 - From 3 500 kg MMA to 7 000 kg MMA: One of class 21A/113B.
 - Up to 20 000 kg MMA: One of class 34A/144B.
 - More than 20 000 kg of MMA: Two of class 34A/144B.

Alternatively to what is indicated here for vehicles for the carriage of goods and items, the requirement will also be considered fulfilled if the minimum number of extinguishers set out in the Agreement on the International Carriage of Dangerous Goods by Road (ADR) is available, depending on their MMA.

Three. The provisions of the First Additional Provision of the Fire Protection Facilities Regulation on Mutual Recognition may apply to the extinguishers covered by this Order.'

Eighth final provision. Amendment to the Supplementary Technical Instructions IF-02, IF-04, IF-09, IF-10, IF-14, IF16 and IF-21 adopted by Royal Decree 552/2019 of 27 September adopting the Safety Regulation for refrigeration facilities and their supplementary technical instructions.

The following Supplementary Technical Instructions adopted by Royal Decree 552/2019 of 27 September are amended as follows:

One. The following footnote is added to Table A of Appendix 1 to Instruction IF-02, 'Classification of refrigerants':

'Note: In addition to the refrigerants listed in this table, those specified in UNE-EN 378-1 may also be used, provided that these do not result in a reduction in safety conditions.'

Two. Paragraph 1 of Appendix 4 to Instruction IF-04, 'Use of different refrigerants', shall read as follows:



1. General.

Where the combination of classification and location access categories provided in Tables A and B of Appendix 1 of IF-04 allow for the use of alternative arrangements, the designer may choose (for some of or all of the spaces occupied by the equipment) to calculate the permitted refrigerant load by using the RCL, QLMV or QLAV values provided in Table A of this Appendix 4. All occupied spaces in which any part of the system containing refrigerant is located shall be taken into account in the calculation of the permissible refrigerant load. These alternative arrangements may only be used for an occupied space that meets all of the following conditions:

- a) Systems where the refrigerant is classified as safety class A1 or A2L according to Table A of Appendix 1 of IF-02.
- b) Systems where the coolant load does not exceed 150 kg and does not exceed $1.5 \times m_3$ for A2L refrigerants.
- c) Systems in which all bypasses (e.g. collectors or T-parts) and all changes in diameter (e.g. reducers) in pipes containing refrigerant in the space in question are manufactured from factory-built fittings or collectors.
- d) Systems that are split and in which the design, dimensioning and selection of materials and components of pipes containing refrigerant installed on the ground in the occupied space in question are in accordance with the instructions of the manufacturers of the factory-built units
- e) Systems in which no valves (e.g. expansion, switch or service valves) or service openings are installed in the occupied space in question, with the exception of valves or service openings forming part of the factory-built units
- f) The location of the system is type 2.
- g) Systems in which the internal unit heat exchanger and system control are designed to prevent damage due to ice formation.
- h) Systems where the parts of the indoor unit that contain refrigerant are protected against fan breakage or the fan is designed to avoid breakage.
- i) Systems where only permanent joints are used in the occupied space in question, except for joints made on site to directly connect the indoor unit to the piping.
- j) Systems where the tubes containing the coolant are installed in the occupied space in question in such a way that they are protected against accidental damage according to section 3.3 of IF-06 and section 3 of this Appendix.
- k) Alternative provisions to ensure safety are provided in sections 2.2 and 2.3 of this Appendix.
- l) The doors of the occupied space are not airtight.
- m) The downstream effect is mitigated by applying section 2.4 of this Appendix.

Provided all the above conditions are met, the maximum leakage in the occupied space is assumed to be no greater than that resulting from a pore and the maximum load is calculated on that basis.'

Three. In section 3.3.2. of Appendix 4 to IF-04 'Renewal openings (to dilute concentration) by natural convention', the formula ' $A = 0.032 \times m / (QLMV \times V)$ ' is amended as follows:

$$'A = 0.0032 \times m / (QLMV \times V)'$$



Four: In section 1.4.1 'General requirements' of IF-09 'Trials, tests and reviews prior to entry into service.' The sentence 'For compact, semi-compact and airtight absorption systems, this sealing test shall be carried out in the factory.', shall be amended as follows:

'For compact and airtight absorption systems, this sealing test shall be carried out in the factory.'

Five. In Appendix 1 'Refrigeration Facility Registration Book Model' to IF-10 'Marking and Documentation.', in 'Certificate of sealing tests', footnote (1) is worded as follows:

'⁽¹⁾ The manufacturer in the case of compact or airtight absorption equipment.'

Six. The following section 3.3 is added to Instruction IF-14, 'Recurrent maintenance, reviews and inspections of refrigeration facilities':

'3.3. Inspections shall be carried out in accordance with the procedures laid down in UNE 192013 or other standards that provide an equivalent level of safety to this standard, in so far as it is not contrary to these regulations.'

Seven. In section 1.1 'Fire protection' of Instruction IF-16 'Prevention and personal protection measures', the phrase 'The installation complies with the requirements of UNE-EN 12845' is replaced with:

'The installation must comply with the requirements set out in the Regulation on fire protection installations adopted by Royal Decree 513/2017 of 22 May'.

Eight. The list of standards in Instruction IF-21, 'Relation of reference UNE standards', is amended as follows:

1. The following reference is added to the table: 'UNE 192013:2022, Procedure for regulatory inspection. Refrigeration facilities.'
2. The following reference is removed from the table: 'UNE-EN 12845:2016, Fixed Firefighting Systems. Automatic sprinkler systems. Design, Installation and Maintenance.'
3. The reference to the standards 'UNE-EN 378-1:2017', 'UNE-EN 378-3:2017' and 'UNE-EN 378-4:2017' shall be replaced with the following references, respectively: 'UNE-EN 378-1:2017+A1:2021', 'UNE-EN 378-3:2017+A1:2021' and 'UNE-EN 378-4:2017+A1:2020'.
4. The following note is added to the bottom of the table: 'Note: In the case of standards referred to in the Official Journal of the European Union for the application of harmonised legislation according to European regulations or directives, those standards (reference and version) shall take precedence over those indicated in this table.'

Ninth final provision. Amendment to Royal Decree 2200/1995 of 28 December adopting the Regulation on Infrastructure for Quality and Industrial Safety.

The following eighth additional provision is inserted in Royal Decree 2200/1995 of 28 December:

'Eight additional provision.

Without prejudice to the exceptions provided for by law or regulation, in order to ensure the safe and correct use of industrial products, the information and documentation to accompany those



products as laid down in the specific national or European Union provisions (including that relating to the contact details of related economic operators, safety instructions and information, declaration of conformity or declaration of performance) shall be provided at least in Spanish, the official Spanish language of the State.'

Tenth final provision. *Entry into force.*

This Royal Decree shall enter into force six months after its publication in the Official State Gazette.

Signed in Madrid,

TO BE SUBMITTED TO THE COUNCIL OF MINISTERS

The Minister for the Presidency, Relations with the Courts and Democratic Memory,



REGULATION ON FIRE SAFETY IN INDUSTRIAL ESTABLISHMENTS

CHAPTER I General provisions

Article 1. Purpose

1. The purpose of this regulation is to lay down the requirements to be met by industrial establishments as regards their safety in the event of fires, to prevent the occurrence of fires and to provide an adequate response in the event of occurrence, by establishing measures to facilitate their rapid detection, to limit their spread and to enable their extinguishing, with the aim of minimising the risk of damage to people, property and the environment.

2. The fire-protection measures established in the current provisions governing industrial, sectoral or specific activities or installations shall take precedence over those established in this Regulation, which in these cases shall only be applied in a complementary manner and for those aspects not provided for in them.

Article 2. Scope of application

1. The scope of this regulation is industrial establishments, understood to mean those whose main use is industrial.

Industrial use for the purposes of this Regulation shall be deemed to be:

- a) Industrial activities as defined in Article 3.1 of Law 21/1992 of 16 July on Industry.
- b) Industrial warehouses as defined in Article 3.
- c) Vehicle repair shops.
- d) Ancillary or complementary services to the activities covered by the preceding paragraphs.

2. The regulation will apply to new industrial establishments that are built or implemented. It shall also apply to industrial establishments already in existence prior to its entry into force where one of the following cases applies:

- a) Existing industrial establishments where extensions or renovations involve an increase in the area or the level of risk intrinsic to their fire sectors or areas (according to the eight levels set out in Table 1.3.1 of Annex I), as well as where substantial changes are made to the main activity. In these cases, these requirements apply only to the part affected by the extension, refurbishment or change, which is generally considered to be the fire sector or area concerned.

In cases of change of ownership, this alone will not necessarily lead to an adaptation to the new rules, provided that the new owner replaces the obligations of the previous owner and there are no other situations that force such adaptation.



- b) Where their level of intrinsic risk, their situation or their characteristics entail a serious risk to persons, property or the environment, and this is determined by the competent body of the relevant Autonomous Community or the cities of Ceuta and Melilla.

3. The following activities are excluded from the scope of this Regulation:

- a) Those carried out in nuclear and radioactive establishments or facilities,
- b) mineral extraction,
- c) agricultural and livestock activities,
- d) installations for military uses,
- e) the service facilities defined in Article 42.1 of Law 38/2015 of 29 September on the Railway Sector.

Article 3. Definitions

For the purposes of this Regulation, the following definitions are laid down:

- a) **Industrial establishment:** Industrial establishment means an industrial establishment intended to be used under a differentiated ownership and under a non-subsidiary regime, and whose main use is industrial, as referred to in Article 2.1. Industrial establishments may consist of a set of one or more buildings, parts thereof and open spaces.
- b) **Industrial warehouse:** Industrial warehouse means any enclosure, whether covered or not, intended primarily for storing products and which:
 - i. is located in an industrial establishment or is part of it,
 - ii. or, those whose use derives from an industrial activity related to transport, referred to in Article 3.4(f) of Law 21/1992 of 16 July on Industry, as well as logistic warehouses, where their total fire load (Q_T) calculated according to Annex I, in both cases, is equal to or greater than three million megajoules.

The concept of logistic warehouse includes activities whose purpose is the reception, deposit, storage, custody, classification and distribution of goods and products.

For the purposes of this regulation, only warehouses of establishments primarily engaged in this activity will be considered logistic. In particular, warehouses located in establishments whose main activity is physical sale (commercial use, according to CTE DB-SI), nor to document stores (understood as archives, libraries or the like), or to stores of tools or equipment that support service companies for carrying out their activity, will not be considered logistic.

Industrial warehouses should not be open to the public and should only be accessible to authorised persons familiar with the general security measures of the establishment.

Note: This Regulation does not apply to warehouses for activities excluded in Article 2.3.

- c) **Passive fire protection:** This refers to the protection derived from the construction requirements of the establishments. Its purpose is to prevent the occurrence of a fire, prevent or delay its spread and facilitate both the extinguishing of the fire and evacuation.
- d) **Active fire protection:** This refers to the set of means, equipment and systems, whether manual or automatic, whose specific functions are to act actively and directly in the protection against fire, by means of the detection, control or extinguishing thereof, facilitating the evacuation of the occupants and preventing the fire from spreading.



- e) Equivalent safety techniques: This refers to the adoption of technical solutions which differ in whole or in part from the technical requirements indicated in this Regulation, but which offer a level of safety equal to or greater than these.
- f) Performance design: This refers to the adoption of a set of technical solutions which differ in whole or in part from the technical requirements set out in this Regulation, and which have been specifically designed for a particular site taking into account all factors relating to it (such as operating conditions and intended use). The proposed set of technical solutions should ensure that the level of safety provided is equal to or higher than what would be achieved when applying the requirements set out in this Regulation.
- g) Qualified technical person: The technical person holding a university qualification with specific competences in the subject matter of this Regulation.
- h) Significant alterations: Extensions or renovations of an industrial establishment involving an increase in the area or the level of intrinsic risk of its fire sectors or areas (in accordance with the eight levels set out in Table 1.3.1 of Annex I) for which it was designed, as well as any other changes that may compromise compliance with the basic safety requirements in the event of fire or which result in a higher demand for requirements as set out in the Annexes to this Regulation. On the contrary, non-significant alterations are considered to be those that do not involve any of the above (such as changes in the layout, machinery or location of the shelving or minor reforms or repairs, provided that they do not imply an increase in the level of intrinsic risk for which it was designed, nor do they compromise the fulfilment of other requirements such as evacuation, sectioning, or any other).

Article 4. Regulatory compatibility

1. When in the same building other uses with different ownership coexist with the industrial activity, for which the Basic Document 'Safety in the Event of Fire' (DB-SI) of the Technical Building Code (CTE), adopted by Royal Decree 314/2006, of 17 March, or equivalent regulations, is applicable, the requirements that must be met by the spaces of non-industrial use will be those required by said regulations.

2. Where, within an industrial establishment, other subsidiary activities that are identified with the uses defined in the CTE DB-SI coexist with the industrial activity, the areas in which they are carried out must comply with the provisions of those regulations when they exceed the surface areas indicated below:

- a) Administrative: built surface area exceeding 250 m².
- b) Commercial: built surface area exceeding 250 m².
- c) Educational: built surface area exceeding 250 m².
- d) Public: built surface area exceeding 250 m².
- e) Residential Housing and Public Residential: always.
- f) Accommodation areas: built surface area exceeding 250 m².
- g) Parking: built surface area exceeding 100 m².
- h) Several adjacent or overlapping uses (a), (b), (c), (d), (f) or (g): built surface area exceeding 250 m² between all of them.

These spaces, when they exceed the indicated areas, must constitute a fire area independent of that of industrial use areas, in accordance with the requirements laid down in CTE DB-SI, however, these areas will continue to be considered part of the industrial establishment.



Areas where additional uses are made to those referred to in points (a) to (h) above, such as changing rooms, sinks, archives or rest areas, shall be considered part of the area for industrial use unless they are adjacent to the areas referred to in the preceding paragraphs or are intended exclusively for personnel whose job is predominantly exercised in those areas, in which case the area shall be counted in those areas for the purposes of this Article.

CHAPTER II

Requirements to be met by industrial establishments

Article 5. Compliance with the requirements

1. The provisions of this regulation shall have the condition of enforceable minimum as indicated in Article 12.5 of Law 21/1992 of 16 July on Industry. These minimums will be considered to be met through one of the following ways:

- a) Compliance with the requirements set out in this Regulation in their entirety.
- b) By application, in particular cases, of equivalent safety techniques or of performance design that deviate in whole or in part from the provisions of Articles 7 and 8. This application shall be carried out under the responsibility of the project executor and subject to the agreement of the owner of the establishment, justifying documentary evidence of the application of these techniques, that the solutions adopted meet the basic requirements of Article 6.1 and that the level of safety obtained is at least equivalent to that obtained by the application of the requirements referred to in Articles 7 and 8 of this Regulation.

2. Industrial establishments whose weighted and corrected fire load density (Q_s), calculated according to Annex I, is exempt from the obligation to comply with the requirements of the regulation, does not exceed 42 MJ/m², provided that its constructed surface is less than or equal to 120 m², and must be located in an own enclosure, physically separated from other establishments that may exist in the same building. In such cases it shall be sufficient to comply with the provisions of Article 12 on operation, maintenance and alterations, and the sections of Annex III concerning fire extinguishers and emergency lighting. In addition, there must be a technical report drawn up and signed by a qualified expert person, justifying compliance with the above, which will be available to the competent administration.

3. When the establishment, extension or renovation of an industrial establishment is carried out in buildings already built of industrial estates with urban planning approved before the entry into force of this regulation, or, in a building already existing in which its characteristics cannot fully comply with the provisions of Article 5(1)(a) or 5(1)(b), reasonable adaptations that differ from what is indicated there may be exceptionally used, provided that their need is justified and the basic requirements of Article 6.1 are met. These adaptations must be documented and submitted together with the project, as indicated in Articles 10 and 11, and following a favourable report from a control body authorised for these tasks in accordance with Royal Decree 2200/1995 of 28 December approving the Infrastructure Regulation for Quality and Industrial Safety. In the event that insufficient justification for regulatory compliance is detected through the corresponding inspection of the documentation submitted or the on-site establishment, the competent body of the relevant Autonomous Community or of the cities of Ceuta and Melilla will require the additional justifications it deems necessary, and if it considers them insufficient or considers that the level of security of the establishment is poor, it may require the application of the additional measures that are appropriate, including the temporary cessation of the activity as long as these are not implemented.



Article 6. Basic safety requirements in the event of fire

1. In order to meet the objectives of this regulation, industrial establishments shall be designed, constructed, maintained and used in such a way that the following basic requirements are met:

- a) Internal spreading: The risk of the fire spreading inside establishments shall be limited.
- b) External spreading: The risk of the fire spreading the on the outside, both within the establishment concerned and to other establishments and buildings, shall be limited.
- c) Evacuation of occupants: The establishment shall have adequate means of evacuation so that occupants can safely leave or reach a safe place within the facility.
- d) Fire protection facilities: The establishment shall have the appropriate equipment and facilities to enable the detection, control and suppression of fire, as well as the transmission of the alarm to the occupants.
- e) Intervention of fire-fighters: The intervention of rescue and firefighting teams shall be facilitated.
- f) Structural resistance to fire: The load-bearing structure shall maintain its fire resistance for as long as necessary for the above basic requirements to be met.

2. These requirements are developed by means of the following articles and annexes.

Article 7. Characterisation

The construction and installation requirements to be met by industrial establishments in relation to their fire safety shall be determined by the configuration of their buildings and open spaces, as well as the level of intrinsic risk of their fire sectors and areas, their surfaces and the type of activity carried out on site (manufacture and other similar processes, or storage). All this shall be assessed by carrying out a characterisation of the establishments as set out in Annex I.

Article 8. Construction requirements and determination of the necessary fire protection facilities

1. The construction requirements to be met by industrial establishments in relation to their fire safety shall be those set out in Annex II, in accordance with the characterisation resulting from the previous article.

2. The facilities for active fire protection installations to be provided by industrial establishments shall be those set out in Annex III, in accordance with the characterisation resulting from the previous article.

3. In addition to the previous paragraphs, Annex IV sets out requirements applicable to individual cases of areas or parts of establishments which, by virtue of their characteristics, may differ partially from the characterisation of Annex I, or from the requirements of Annexes II and III, or which require specific considerations.



Article 9. Requirements for construction products and fire protection installations

1. Construction products that incorporated on a permanent basis in industrial establishments shall be CE marked in accordance with Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the placing on the market of construction products; as well as in accordance with the other European regulations and directives applicable to them.

2. Construction products not covered by CE marking must comply with the provisions of this Regulation for each case, as well as with what is required in the other specific legislation that may apply to them, and must have, if the product has an impact on the safety of the establishment, the test reports, certifications or other technical documentation necessary to endorse their characteristics. The economic operator responsible for placing the product on the market, as well as distributors, shall provide the recipient of the product with the relevant information on the product, providing the documentation showing its intended use, its characteristics and performance, the reference to the reports, certifications or other documentation it possesses, as well as instructions and safety information for its proper installation and use.

3. The equipment, systems and components that make up the active fire protection facilities will comply with the provisions of the Regulation on fire protection facilities, adopted by Royal Decree 513/2017 of 22 May.

4. For products that must have certain characteristics or minimum performance (such as a class of resistance or reaction to fire), depending on their intended use, such information shall be provided for in the project or technical report. Subsequently, during the construction phase, it must be checked that the products used meet these characteristics and performances and that they have been installed correctly. The certificate referred to in Article 11(1)(b) shall state expressly that such checks have been carried out.

In this way, for CE marked products in accordance with Regulation (EU) No 305/2011 of the Parliament and of the Council of 9 March, as well as in accordance with the other European provisions that may apply, their documentation will be checked before they are installed, verifying the content of the Declaration of Performance and Declaration of Conformity (as applicable) issued by the manufacturer, as well as the instructions and other documentation as necessary. When verifying the Declaration of Performance, it will be verified that the intended use of the product, its essential characteristics and its declared performance are adequate. For products to which the CE marking does not apply, verification of their documentation shall be carried out in an equivalent manner.

CHAPTER III

Construction, entry into service, operation and maintenance

Article 10. Construction and implementation projects

1. The industrial establishments referred to in Article 2(2), as well as those that undergo significant changes in accordance with Article 12(4), shall require the preparation of a project. This project will be part, where appropriate, of the project defined in Article 4 of Law 38/1999 of 5 November on the Management of Buildings, or of the report required by the legislation in force to obtain the necessary permits or authorisations.

2. The said project shall be drawn up and signed by a qualified expert person and must contain the necessary information and documentation to justify compliance with the requirements to be met by



industrial establishments with regard to their safety in the event of fire, in accordance with this Regulation. In addition, this content will include the information requested in Article 9(4), as well as the provisions of Article 19(1) of the Fire Protection Facilities Regulation, respective to the equipment and systems to which it applies.

3. For particular cases where it is chosen to use equivalent safety techniques or performance design, as referred to in Article 5(1)(b), the project must use documentation to justify the use of these techniques, as well as that the solutions adopted meet the basic requirements of Article 6(1) and that the level of safety obtained is at least equivalent to that obtained by the application of the requirements indicated in this Regulation. Together with the project, an independent third-party report must be annexed, which positively validates the effectiveness and adequacy of technical solutions, issued by a control body authorised for these tasks in accordance with Royal Decree 2200/1995 of 28 December adopting the Infrastructure Regulation for Quality and Industrial Safety.

These techniques may be used in particular cases where circumstances so warrant and where, on the basis of this, the intention is to replace some of the requirements of Annexes I, II, III or IV to the Regulation (including the non-permitted locations listed in Annex II, Heading III) with equivalent solutions, departing from the provisions of Articles 7 and 8. The project shall list the non-compliant sections of those annexes and document the solutions chosen.

In the case of using equivalent safety techniques, the technical solutions adopted must be justified on the basis of reputable standards or design guides, this being detailed in the project.

In the case of using performance design, the performance-based project must follow the methodology set out in UNE-ISO 23932 and UNE-ISO 16733-1, or other equivalent reputable standards or guidelines. If the use of calculation methods to predict fire-related phenomena is necessary, these shall be verified and validated in accordance with UNE-ISO 16730-1 or other equivalent specification. The project must detail all the considerations that were necessary to know regarding the performance design carried out (safety objectives, conditions of use of the facilities and any other considerations that may exist). In addition, a specific control and monitoring of the performance of the safety objectives in the material execution phase of the project must be carried out and a validation or test plan of the work carried out must be in place to validate the safety benefits ultimately achieved.

4. For the purposes of implementing this Regulation, the project may be replaced with a technical report signed by a qualified technical person if the industrial establishments fulfil the following three conditions: Their built surface area is less than 300 m², all fire sectors or areas are of low intrinsic risk and the provisions of Article 10(3) do not apply to them.

Article 11. Entry into service

1. For the entry into service of the industrial establishments referred to in the previous article, it is necessary to submit, by means of a **communication**, to the competent industry body of the corresponding Autonomous Community or the cities of Ceuta and Melilla, the following documents for registration:

- a) The project or technical report, with the content set out in Article 10.
- b) A certificate issued by a qualified technical person in the field showing the suitability of the installations to the project (or technical report) and compliance with the relevant technical conditions and regulatory requirements. This certificate must show the number of fire sectors and areas, the intrinsic risk of each of them, state that the checks referred to in Article 9(4) have been carried out and indicate, where appropriate, whether equivalent safety techniques or performance design have been used. Where the project can be replaced with a technical report in accordance with Article 10(4), the certificate and the technical report may be put together in the same document.



- c) For establishments whose built surface area of their fire sectors and areas of medium and high intrinsic risk level reaches a total of 1 000 m² or more, or, for those to which Article 10(3) applies, an initial inspection report, issued by a control body authorised for these tasks in accordance with Royal Decree 2200/1995 of 28 December must be submitted, showing that the establishment is in conformity with the project and with the provisions of this Regulation.
- d) Lastly, the documentation referred to in Article 20 of the Fire Protection Facilities Regulation, adopted by Royal Decree 513/2017 of 22 May, will be included.

2. Alternatively to the communication referred to in section 1, the placing into service shall be carried out by submitting a **responsible declaration** where established by the competent industry body of the relevant Autonomous Community or the cities of Ceuta and Melilla. In this case it will not be necessary to submit the documentation mentioned above, but it will be sufficient to have it available to the competent administration.

3. The owner must keep a copy of the documentation referred to in section 1 (and, where appropriate, of the proof of having submitted the responsible declaration referred to in section 2), and include it, where appropriate, in the Building Book, as set out in the legislation in force.

4. If, in the course of the checks following entry into service carried out by the competent body of the administration, it is found that an industrial establishment does not comply with the necessary requirements, or that the solutions adopted pursuant to Article 5(1)(b) are not properly documented and justified or do not provide the required equivalent level of safety, or any other situation that would imply that the safety level of the establishment is deficient, the competent body may require the application of the additional measures necessary to address the deficiencies found.

Article 12. Operation, maintenance and alterations

1. The owners of industrial establishments shall be responsible for ensuring that they are used and maintained in the appropriate conditions, so that they can at all times meet the basic fire safety requirements for which they were designed.

2. The equipment, systems and components that make up the fire protection installations of industrial establishments, subject to the provisions of the Regulation on fire protection installations, shall be subject to the maintenance revisions provided for in that regulation.

3. The usual occupants of industrial establishments must be aware of the main characteristics of these (such as existing fire protection systems, sectioning, evacuation routes and other aspects related to fire safety) and how to act in the event of fire. All this without prejudice to the existence of a self-protection plan when the specific regulations so provide, in accordance with Royal Decree 393/2007 of 23 March adopting the Basic Standard for the Self-Protection of centres, establishments and units dedicated to activities that may give rise to emergency situations, and without prejudice to what may be established by other specific legislation.

4. If significant alterations are made to the establishment once the establishment has been put into service, the documents required by Articles 10 and 11 shall be resubmitted for the part concerned. On the contrary, it will not be necessary to submit such documents if the alterations made are not significant, in which case it will be sufficient for the holder to document and justify this situation, while keeping the information at the disposal of the competent authorities and the control bodies carrying out the periodic inspections.



CHAPTER IV Inspections

Article 13. *Periodic inspections*

1. Regardless of the inspection function assigned to the competent industry body of the relevant Autonomous Community or the cities of Ceuta and Melilla, operators of industrial establishments must request the periodic inspection of their facilities from a control body authorised for those tasks in accordance with Royal Decree 2200/1995 of 28 December. Such inspections shall be carried out at least every five years.

2. Regular inspections shall verify compliance with the applicable legislation, highlighting the following aspects:

- a) That there have been no changes in the activity that are not in accordance with the provisions of this Regulation.
- b) That the type of the establishment, fire sectors and areas and their level of intrinsic risk continues to be maintained.
- c) That fire-protection facilities continue to be required in accordance with the requirements of the project.
- d) That both the construction requirements (passive protection) and the fire protection facilities (active protection) are in proper operating condition, so that the establishment can comply at all times with the basic fire safety requirements for which it was designed. It will also be checked that the installations to which the Fire Protection Facilities Regulation applies have passed their latest maintenance reviews.
- e) In the event that equivalent safety techniques have been used, it shall be further verified that the specific conditions set out in the project are still met. In the case of having taken performance design route, in addition to all the above, it will be verified that the operating and use conditions, as well as the other considerations provided for during the design, remain compliant.

Inspections shall be carried out in accordance with the procedures established in UNE 192005-1 in any way that does not contradict these regulations, or other specifications that provide a level of safety equivalent to this, or the equivalent protocol that each autonomous community has established.

3. Of these inspections, a report shall be drawn up, signed by the inspector of the control body and by the operator of the facility, who shall keep a copy, which shall be available to the competent industry authority of the relevant Autonomous Community or the cities of Ceuta and Melilla.

Article 14. *Special inspection programmes*

1. The competent industrial safety management body of the Ministry of Industry, Trade and Tourism may, after consultation with the Coordinating Council for Industrial Safety, promote special inspection programmes for those industrial sectors or industries where it deems it necessary to contrast the degree of application and compliance with this Regulation.

2. These inspections shall be carried out by the competent bodies of the relevant Autonomous Communities or cities of Ceuta and Melilla or, if they so establish, by control bodies empowered to implement this Regulation.



Article 15. Corrective measures

1. If significant deficiencies in compliance with regulatory requirements are identified as a result of the inspections referred to in Articles 13 and 14, they shall be remedied as soon as possible, setting a maximum time limit to demonstrate that appropriate corrective measures have been implemented; which shall not exceed six months. If after this period the defects have not been remedied, the inspection body must send the certificate with a negative rating to the competent body of the relevant Autonomous Community or the cities of Ceuta and Melilla.

2. If a serious and imminent risk arises from the deficiencies identified, the control body shall issue a negative certificate of inspection to be sent to the competent body of the relevant Autonomous Community or the cities of Ceuta and Melilla, for its information and to appropriate effects.

CHAPTER V Action in the event of fire

Article 16. Providing information on fires

The person in charge of the industrial establishment must inform the competent industry body of the relevant Autonomous Community or of the cities of Ceuta and Melilla, within a maximum period of 15 working days, of any fire that occurs in the industrial establishment in which any of the following circumstances occur:

- a) Personal injury requiring external medical attention.
- b) A total cessation of industrial activity.
- c) A partial cessation of more than 14 days of industrial activity.
- d) Material damage in excess of EUR 30 000.

Article 17. Fire investigation

In the case of all fires in which the circumstances provided for in paragraphs (a), (b) or (c) of the previous article occur, the competent industry body of the relevant Autonomous Community or the cities of Ceuta and Melilla shall collect detailed information about the fire, or in the absence thereof, conduct an investigation to try to ascertain its origin and causes. It shall then forward this information to the Sectoral Conference of Industry and SMEs, in order to carry out a joint assessment, within it, of the possible regulatory adaptation needs that may arise from such fires.

For the collection of the information indicated and for the conduct of the investigation, the competent body may require the assistance of specialists such as the Fire Department or competent organisations or technicians.

All of this, without prejudice to the penalty proceedings that may be initiated for alleged regulatory infringements and to the responsibilities that may arise if there is a finding of non-compliance with the conduct of the regulatory inspections required in Chapter IV or of deficiencies related to operation and maintenance in accordance with the provisions of Article 12.



CHAPTER VI Sanctions regime

Article 18. *Infringements and penalties*

Infringements to the provisions of this regulation will be classified and sanctioned in accordance with the provisions of Title V of Law 21/1992 of 16 July on Industry.



ANNEX I CHARACTERISATION OF INDUSTRIAL ESTABLISHMENTS

This annex details how industrial establishments can be characterised in relation to safety in the event of fire. To do this, first, the buildings and open spaces that form the establishment must be classified according to their configuration. Subsequently, fire sectors (in buildings) and fire areas (in open spaces) must be identified and, finally, the level of intrinsic risk of each sector and area must be calculated.

The requirements defined in Annexes II and III to this Regulation shall be determined for each fire sector or area on the basis of the configuration to which they belong, their level of intrinsic risk and their surface area.

1. Classification of buildings and open spaces according to their configuration

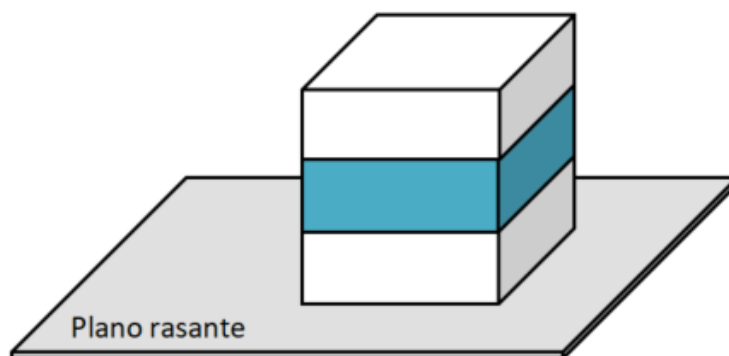
Industrial establishments may consist of a set of one or more buildings, parts thereof and open spaces. These will be classified according to their configuration taking into account factors related to their situation, location and environment.

In this way, each building and each open space will belong to one of the following configuration types:

1.1. Building configurations

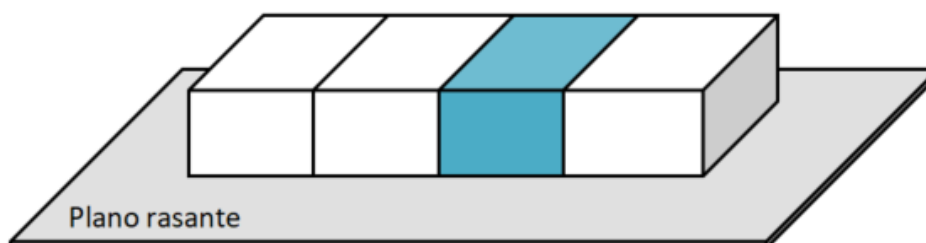
1.1.1. Building type A: The establishment considered partially occupies a building that also has other establishments, whether for industrial use or other uses.

Within the type A configuration, depending on the part of the building that is occupied by the establishment considered, there will be a difference between type A_v and A_h , depending on whether the separation of that establishment with the other establishments of the building is done vertically or horizontally, as shown in the figures.



Plano rasante	Ground plane
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Figure 1.1: Type A_v configuration (common structure with other establishments, separated vertically).



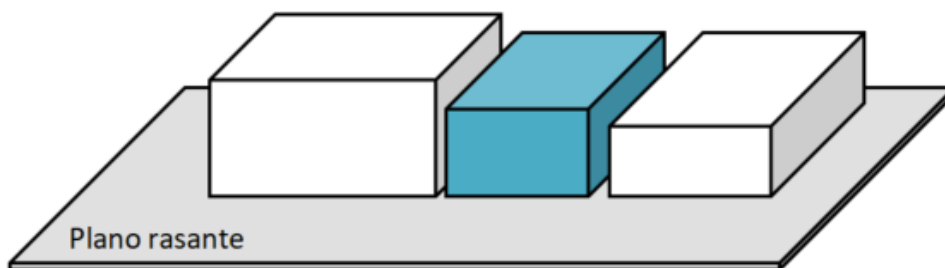
Plano rasante	Ground plane
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Figure 1.2: Type A_h configuration (common structure with other establishments, separated horizontally).

In the event that the separation between the industrial establishment concerned and the other establishments simultaneously mixes characteristics of types A_v and A_h, it shall be considered as type A_v.

In the event that the establishment considered occupies the entire building, with supporting structure and independent enclosure, it shall be classified as type B or C as appropriate depending on what is indicated in the following paragraphs.

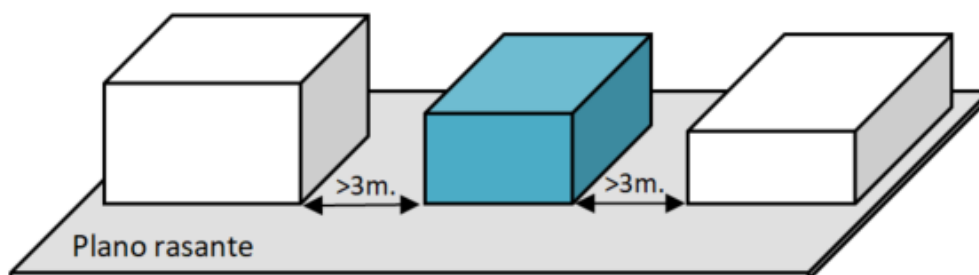
1.1.2. Building type B: The establishment considered completely occupies a building, with supporting structure and independent enclosure, which is adjacent to another, or other, buildings of another establishment; or, it is at a separation distance equal to or less than 3 m from another, or other, buildings of another establishment, whether these for industrial use or other uses.



Plano rasante	Ground plane
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Figure 1.3: Type-B configuration (separate structure, adjacent or ≤ 3 m from buildings of other establishments).

1.1.3. Type-C building: The establishment considered completely occupies one or more buildings, which are at a distance of more than 3 m from the nearest building to other establishments. That distance must be free of combustible goods or intermediate elements capable of spreading the fire.



Plano rasante	Ground plane
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Figure 1.4: Type C configuration (more than 3 m from buildings in other establishments).

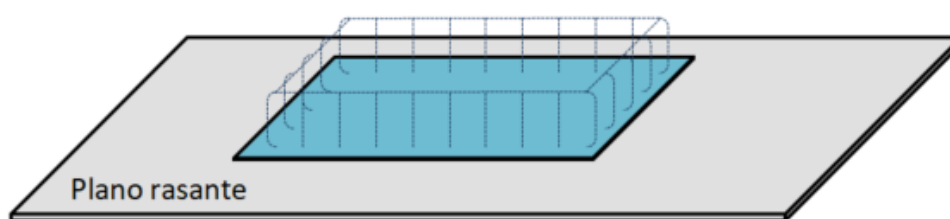
For establishments with several buildings, these will be considered independent buildings of the same establishment when the separation distance between them is greater than 3 m, or, when its adjoining walls meet the requirements of separating walls between fire sectors, having in addition supporting structure and independent enclosure. Otherwise, such buildings shall be deemed a single building for the purposes of this classification.

In the case of connections between different establishments or buildings, such as tunnels, walkways or conveyor belts, necessary for production reasons, buildings may continue to be considered as type-C buildings provided that such connections have compartmentalisation elements with respect to

both buildings, the evacuation conditions are guaranteed and the possible collapse of their structure does not affect that of the buildings.

1.2. Open space configurations

1.2.1. **Type-D space:** The establishment considered occupies an open space.



Plano rasante	Ground plane
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Figure 1.5: Type-D configuration (open space).

The open space may be uncovered, or covered by structures that lack all or part of side closures.

If the space has covered areas, lateral openings sized according to the following criteria shall be available:

Table 1.1.1.
OPEN SIDE AREA (L),
DEPENDING ON COVERED SURFACE AREA (A) AND HEIGHT (H)

	H < 5 m	H ≥ 5 m
A < 500 m ²	L ≥ 25%	L ≥ 25%
A between 500 and 1 500 m ²	Not admitted	L ≥ 50%
A > 1 500 m ²	Not admitted	L ≥ 70%

Where:

A: Surface area covered.

H: Interior height from ground to cover.

L: Lateral area permanently open to the outside (gaps) of the perimeter involute. It is expressed as a percentage of the total lateral area (closed walls + gaps).



The indicated open side area must be distributed in such a way as to allow rapid dissipation of heat and smoke. When the requirements of the table are not met, the covered area should be considered as configuration type A, B or C, as appropriate.

Type D spaces may have some specific closed areas, such as toilets or changing rooms, provided that they do not host the main activity of the establishment and do not increase the risk of fire.

1.3. Other considerations

Where a building or open space does not exactly match any of the types of configurations defined in sections 1.1 and 1.2, it shall be considered to belong to the type with which it can best be equated or justifiably assimilated.

When an establishment consists of several buildings, parts of buildings or open spaces with different configurations, each one shall be classified separately from other establishments, and the requirements of Annexes II, III and IV of the Regulation shall apply to each of them according to that classification.

2. Identification of fire sectors and areas

2.1. The buildings, parts of buildings and open spaces that form industrial establishments can be divided into one or more zones, which shall constitute fire sectors or areas, according to the following criteria:

- a) **Fire sector:** Area of a building inside which the fire can be confined (or excluded) for a certain period of time, so that it cannot spread to (or from) other fire sectors or areas, either by bounding fire-resistant building elements or by means of perimeter spaces of the building.
- b) **Fire area:** Open space separated from other areas and defined by its perimeter. The arrangement of the elements in the fire areas shall be such that the spread of the fire is limited to (or from) buildings or other adjacent fire areas, either by means of fire-resistant elements or by means of perimeter spaces.

2.2. When planning how an establishment will be divided into sectors, the nature of the activities to be carried out in it, its inherent risks, as well as the other factors that may influence safety should be taken into account. Based on this, you can choose to establish a single fire sector (or area), or separate processes and storage in differentiated sectors, or divide the establishment into sectors according to the risk of each activity, etc. All this without prejudice to the minimum divisions into sectors that may be required in this regulation or in other specific regulations.

3. Characterisation of fire sectors and areas according to their intrinsic risk level

3.1. The intrinsic risk level (NRI) of a fire sector or area reflects the risk therein of a possible fire, derived from the amount of combustible material present, their flammability, distribution and the nature of the activities carried out on the site.

The intrinsic risk level will be classified as low, medium or high, and in turn, it will be subclassified between the values of 1 to 8 according to the weighted and corrected fire load density (Q_s) present in the fire sector or area referred to, according to Table 1.3.1.

Table 1.3.1.

INTRINSIC RISK LEVEL ACCORDING TO THE WEIGHTED AND CORRECTED FIRE LOAD DENSITY (Q_s)

Intrinsic risk level		Q_s (MJ/m ²)
LOW	1	$Q_s \leq 425$
	2	$425 < Q_s \leq 850$
MEDIUM	3	$850 < Q_s \leq 1\ 275$
	4	$1\ 275 < Q_s \leq 1\ 700$
	5	$1\ 700 < Q_s \leq 3\ 400$
HIGH	6	$3\ 400 < Q_s \leq 6\ 800$
	7	$6\ 800 < Q_s \leq 13\ 600$
	8	$Q_s > 13\ 600$

3.2. The weighted and corrected fire load density (Q_s) of each fire sector or area shall be calculated using any of the following possible methods:

- a) Calculation of Q_s from the combustibility data of the materials present (section 3.2.1).
- b) Calculation of Q_s from fire load density data from areas with manufacturing activities and other similar processes (section 3.2.2).



- c) Calculation of Q_s from fire load density data from storage areas (section 3.2.3).
- d) Calculation of Q_s combining several of the above methods (section 3.2.4).

Each of the methods is developed below:

3.2.1. Calculation of Q_s from the combustibility data of the materials present.

The following expression shall apply:

$$Q_s = \frac{\sum (q_i G_i i C_i)}{A} R \text{ (MJ/m}^2\text{) } i$$

Where:

Q_s : fire load density, weighted and corrected, of the fire sector or area, in MJ/m².

q_i : heat value, in MJ/kg, of each of the combustible materials (i) that exist in the fire sector or area.

G_i : mass, in kilograms, of each of the combustible materials (i) that exist in the fire sector or area.

C_i : a dimensional coefficient that weighs up the degree of danger due to the combustibility of each of the combustible materials (i) that exist in the fire sector or area.

R : a dimensional coefficient that corrects the degree of danger inherent in the industrial activity that takes place in the fire sector or area (production, assembly, transformation, repair, storage, etc.).

A : built surface area of the fire sector or area surface, in square metres.

Details to consider:

- i. Regarding the G_i value of combustible materials, the quantity of the various combustible materials to be contained in the fire sector or area should be considered, under maximum production or storage conditions, also considering packaging and transport materials such as encapsulated protective plastics, cardboard or pallets and plastics, as well as combustible furniture. In these cases, the amount of each must be calculated.
- ii. In the case of storage, the maximum number of pallets or intended storage units should be indicated and accompanied by plans of the floor distribution of storage areas and spaces and the sections reflecting the maximum storage heights.



- iii. The heat value, q_i , of each combustible material, can be deduced from Table 1.3.3, or obtained from other sources of information, the use of which must be justified.
- iv. Building elements and products that are part of the fire sector or area (such as those present on walls or ceilings) should also be considered as combustible materials and included in the calculation. The calculation of its heat value can be carried out according to the system set out in the standard UNE-EN ISO 1716, or, using other reputable reference sources, in a justified way. As an exception, if the construction element is separated from the interior of the sector by a fire-resistant layer of at least EI 30, it cannot be counted in the calculation. In addition, it is not necessary to consider non-combustible building materials (e.g. concrete or steel) or those whose fire load is not relevant compared to the total load of the sector.
- v. The values of the combustibility hazard coefficient, C_i , for each combustible material can be deduced from Table 1.3.2, or from other reputable sources of information whose use must be justified. Alternatively, Table 1.3.3 can also be used, where C_i values of some materials are included.
- vi. The value of the coefficient R can be deduced from Table 1.3.4.
- vii. The calculation of Q_s can be simplified by discarding non-representative materials from the formula due to their limited contribution to this value. In the case of applying these simplifications, in no case should the calculated value of Q_s be diverted more than 10% from the total from what would be obtained if all discarded materials had been taken into account. In addition, in the case of not knowing the exact values of a given material (G_i , q_i) approximate estimates and safety coefficients may be used, provided that their use and provenance are justified, and that the calculation obtained from Q_s is equal to or higher than what would be obtained if the exact values were used.

3.2.2. Calculation of Q_s from fire load density data from areas with manufacturing activities.

Alternatively to the calculation method of Q_s in section 3.2.1, for fire sectors or areas with specific manufacturing activities and other similar processes, such as production, processing, repair or any other activity other than storage, the following expression may be used:

$$Q_s = \frac{\sum (q_{si} S_i C_i)}{A} R (\text{MJ}/\text{m}^2)$$

Where:



Q_s , C_i , R and A have the same meaning as in section 3.2.1.

q_{si} : fire load density of each zone with a different activity (i) according to the different processes that are carried out in the fire area, in MJ/m².

S_i : built surface area of each area with a different activity (i), in square metres.

Details to consider:

- i. The values of the medium fire load density, q_{si} , can be obtained by reference to Table 1.3.5, where average values are shown for certain common activities. When the q_{si} value of an activity does not appear, or the value that appears does not fit the specific case, the value of the most comparable activity must be used, or, failing that, its value calculated based on the existing materials. In any case, it is the responsibility of the planner to ensure that the q_{si} values used are correct and conform to each specific situation, and, where appropriate, increase these values or add the safety coefficients that are necessary to ensure that the calculation obtained will not be lower than the actual situation of the establishment.
- ii. In this expression, the weighting coefficient C_i is applied to each zone with a different activity, its value being obtained from Table 1.3.5.
- iii. For the surface value S_i of the activities, the extension of the different combustible materials, machinery, equipment, collections, furniture, etc. that the fire sector or area may contain, should be considered, under maximum production conditions. It must be accompanied by plans for the floor distribution of the areas and surface areas of the activities. On the other hand, no separate account will be taken of collections, deposits of materials or products assembled for the maintenance of production processes of assembly, processing or repair, or resulting from the same, the consumption or production of which is daily and constitute the so-called 'daily storage'. These materials or products shall be considered as incorporated into the activity to which they are to be applied or from where they come.
- iv. In total, considering all zones, the sum of surfaces in each zone ($\sum S_i$) should be equal to A . If there are large open areas (empty, no activity and no fire load), these areas may be viewed separately in the sum as areas without fire load ($q_{si}=0$). (Note: Picking areas, loading docks or similar areas where there may regularly be fire loads, should be considered as areas with activity).
- v. The Q_s value obtained must also be added to the fire load coming from the building elements and products, applying the expression in section 3.2.1 and the considerations cited therein. In the event that the construction element is separated from the interior of the sector by a fire-resistant layer of at least EI 30, it cannot be counted in the calculation. In addition, it may be chosen to rule out the fire load of the building elements in their entirety if it is justified that the Q_s obtained deviates by



less than 10% from the total of what would be obtained if these had been taken into consideration.

3.2.3. Calculation of Q_s from the fire load density data of the storage areas.

For fire sectors or areas dedicated to storage, the following expression can be used:

$$Q_s = \frac{\sum (q_{vi} h_i S_i C_i)}{A} R (\text{MJ/m}^2)$$

Where:

Q_s , C_i , R and A have the same meaning as in the previous section.

q_{vi} : fire load, provided by each cubic metre of each area with different type of material storage (i) existing in the fire sector or area, in MJ/m^3 .

h_i : height of each of the material storages (i), in metres.

S_i : built surface area of each material storage (i), in square metres.

Details to consider:

- i. The values of the fire load per cubic metre, q_{vi} , provided by each of the fuels, can be obtained by taking as a reference Table 1.3.5. When the q_{vi} value does not appear, or the value that appears does not fit the specific case, the most comparable value must be used, or, failing that, its value calculated based on the existing materials. In any case, it will be the responsibility of the planner to ensure that the values of q_{vi} used are correct and conform to each specific situation, and where appropriate, increase these values or add the safety coefficients that are necessary to ensure that the calculation obtained will not be lower than the actual situation of the establishment. In addition, the maximum number of intended storage units (e.g. pallets) shall be indicated and accompanied by plans of the floor distribution of storage zones and surface areas and the sections reflecting maximum storage heights.
- ii. In this expression, the weighting coefficient C_i shall be applied to each area with different types of storage, and its value is obtained from Table 1.3.5.
- iii. The surface area S_i corresponds to the surface area of the storage space, including the space where the stored products are physically (shelves, etc.). Depending on whether or not the surface area S_i includes the surface area of the adjacent corridors that may exist, necessary for the performance of the storage activity, the corresponding value of q_{vi} should be chosen from Table 1.3.5: q_{vi} of 'raw storage' if S_i includes adjacent corridors, or q_{vi} of 'net storage' if S_i does not include the adjacent corridors.

- iv. In total, considering all zones, the sum of surface areas in each zone ($\sum S_i$) should be equal to A. If there are large diaphanous areas (empty, no activity and no fire load), these zones may be considered separately in the sum as areas without a fire load ($q_{vi}=0$). (Note: It should be taken into account whether the S_i surface areas have been calculated with q_{vi} gross or net storage values. In the case of using the net storage values, the surfaces of the adjacent aisles should be added separately as areas without fire load).-
- v. The Q_s value obtained must also be added to the fire load coming from the building elements and products, applying the expression in section 3.2.1 and the considerations cited therein. In the event that the construction element is separated from the interior of the sector by a fire-resistant layer of at least EI 30, it cannot be counted in the calculation. In addition, it may be chosen to rule out the fire load of the building elements in their entirety if it is justified that the Q_s obtained deviates by less than 10% from the total of what would be obtained if these had been taken into consideration.

3.2.4. Calculation of Q_s combining several of the above methods.

3.2.4.1. For fire sectors or areas that have both manufacturing areas and storage areas: If production and storage areas coexist in the same sector or area, to calculate Q_s , a combination of the two expressions in sections 3.2.2 and 3.2.3 may be applied:

$$Q_s = \sum (q_{si} S_i C_i) + \frac{\sum (q_{vi} h_i S_i C_i)}{A} R (\text{MJ/m}^2)$$

Where the first sum covers the areas with manufacturing activities and the second sum the storage areas. The considerations to be taken into account are the same as those set out in sections 3.2.2 and 3.2.3. In total, considering all zones, the sum of surface areas ($\sum S_i$) should be equal to A.

3.2.4.2. If necessary, a combination of the three expressions in sections 3.2.1, 3.2.2 and 3.2.3 may also be used by zone:

$$Q_s = \sum (q_{si} S_i C_i) + \sum (q_{vi} h_i S_i C_i) + \frac{\sum (q_i G_i C_i)}{A} R (\text{MJ/m}^2)$$

Where the first sum includes areas with manufacturing activities, the second sum includes storage areas and the third covers the rest of the areas that have not been considered in the previous sums.



3.2.4.3. Alternatively to the above methods, the use of other reputable assessment methods can also be used for the calculation of intrinsic risk. In such cases, the method used must be justified in the project.

3.3. Calculation of the total fire load (Q_T).

When it is necessary to know the weighted and corrected total fire load (Q_T), it can be calculated by applying any of the expressions of Q_s (measured in MJ/m²) of the previous sections, omitting the division by surface area A (measured in m²), which produces the results in megajoules. Alternatively, the same result is obtained by multiplying Q_s by A .

For example, for section 3.2.1, the expression of Q_T would be as follows:

$$Q_T = \sum (q_i G_i C_i) R \text{ (MJ)}$$



Table 1.3.2.
DEGREE OF HAZARD OF COMBUSTIBLE MATERIALS:
VALUES OF THE COMBUSTIBILITY HAZARD COEFFICIENT (C_i)

Degree of hazard ^{(1) (2) (3)}	1	2	3	4	5
Value of C _i	C _i = 1.60 or, C _i = 1.92 if it produces smoke ⁽⁴⁾	C _i = 1.40 or, C _i = 1.68 if it produces smoke	C _i = 1.20 or, C _i = 1.44 if it produces smoke	C _i = 1.00 or, C _i = 1.20 if it produces smoke	C _i = 1.00 or, C _i = 1.20 if it produces smoke
Explosives	H200 [Examples: ethyl nitrate, hydroxylamine, nitroglycerin] H201 div.1.1 [Examples: trinitotoluene TNT]	H202 div.1.2 [Examples: cartridges, Bengal matches]	H203 div.1.3	H204 div.1.4	H205 div.1.5 H206 div.1.6
Solids	They ignite very easily and are consumed very quickly H228 cat.1 [Examples: red phosphorus, magnesium powder or chips, pentachlorobenzene] H250 pyrophoric solids [Examples: cadmium, aluminium powder, magnesium, zirconium or zinc]	They ignite and are consumed quickly H228 cat.2 [Examples: celluloid films, camphor]	Easily flammable [Examples: cotton, sulphur, benzole, coffee, carbon, cardboard (uncompacted), cellulose, cereals, coconut fibres, flour, wood in fibres or wood or cork in small pieces, paper in sheets, foamed polystyrene (EPS and XPS), epoxy resins, flax fabrics, textiles]	Moderately flammable [Examples: polyvinyl acetate (PVAC), starch, anthracite, anthracite, sugar, cardboard (compacted), rubber, leather, ebonite, vegetable fats, coal, wool, milk powder, wood or cork in large pieces, butter, compressed paper, polyamide (PA), polycarbonate (PC), polystyrene (PS), polyethylene (PE), polyurethane (PU), rayon, sisal, tobacco, tea, peat]	Not very combustible (only in contact with fire) [Examples: acetamide, polyvinyl chloride (PVC), phenolic resins (PF), urea-formol (UF) resins]
Liquids	Extremely flammable liquids and vapours H224 cat.1 [Examples: acetaldehyde, diethyl ether, furan, gasoline] H225 cat.2 [Examples: acrolein, ethyl alcohol (> 70%) or methyl, cyclohexane, cyclopentane, diethylamine, diethylacetone, hexane, octane, pentane, carbon sulphide, toluene]	Highly flammable liquids and vapours H226 cat.3 with flash point below 55°C [Examples: amyl acetate, acetic acid, turpentine, butyl alcohol, dipentene, xylene]	Flammable liquids and vapours Flash point between 55°C and 100°C [Examples: creosote oil, aniline, benzaldehyde, diesel fuel, tetraline]	Flash point exceeding 100°C [Examples: cotton, flax or olive oils, benzoic acid, glycerin]	Not very flammable (no flashpoint, only in contact with fire) [Examples: chloroform, dioxin, phosphamide]



	H250 pyrophoric liquids [Examples: dimethylzinc, trichlorosilane]				
Gases	Extremely flammable gas H220 cat.1 [Examples: acetylene, butane, vinyl chloride, hydrogen, methane, carbon monoxide, propane]	Flammable gas H221 cat.2 [Examples: anhydrous ammonia]			Not very flammable [Examples: bromomethane]
Aerosols	H222 cat.1	H223 cat.2			Not very flammable
Organic peroxides and Spontaneous reaction	H240 Type A	H241 Type B	H242 Type C H242 Type D	H242 Type E H242 Type F	H242 Type G
Spontaneous combustion	H251 cat.1 [Examples: Sodium hyposulfite, sodium ethanolate or methanolate of sodium or potassium]	H252 cat.2			

Table Notes:

Note 1: The boxes of the table indicate the H phrases according to Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (CLP Regulation).

Note 2: If a material presents different degrees of hazard depending on its characteristics (e.g. flammable and self-reactive) the characteristic that determines the highest degree of coefficient C_i shall be adopted.

Note 3: Alternatively, for classification in one of the five columns of the table, the '*Classification of Materials and Goods*' in the *CEA Catalogue* can also be used, where the 'GG' coefficient in the catalogue corresponds to the 'degree of hazard' of the table. Similar reputable tables may also be used where justified. In case of discrepancy with the classification according to H phrases, the CLP Regulation will be adopted.

Note 4: Materials 'that produce smoke' means materials that, in the event of a fire, give off a large amount of smoke so that evacuation and extinguishing work may be difficult. The existence of products that produce smoke makes it necessary to increase the coefficient C_i by 20%, as indicated in the table. The smoke-producing characteristic of the materials can be justified by using the '*Classification of Materials and Goods*' in the *CEA Catalogue* (complementary property 'Fu') or similar reputable tables. Some examples of elements that produce smoke are: lubricating oils, acetylene, aniline, asphalt, benzole, rubber, polyester fibres, petrol, pneumatics, petroleum, foamed plastics, resins or toluene.



Table 1.3.3.
HEAT VALUES OF VARIOUS SUBSTANCES (q)

Material	CAS No. ⁽¹⁾	Heat value (q)	C _i ⁽²⁾	CLP ⁽³⁾
Creosote oil	90640-84-9	37.62 MJ/kg	1.44 ⁽⁴⁾	
Cotton grain oil (seeds)		37.62 MJ/kg	1.00	
Linseed oil	8001-26-1	39.30 MJ/kg	1.00	
Flax oil		37.62 MJ/kg	1.00	
Olive oil	8001-25-0	39.60 MJ/kg	1.00	
Paraffin oil	8042-47-5	41.80 MJ/kg	1.00	
Lubricating oil		42.00 MJ/kg	1.20 ⁽⁴⁾	
Mineral oil		45.90 MJ/kg	1.44 ⁽⁴⁾	
Vegetable oil		41.80 MJ/kg	1.00	
Acetaldehyde	75-07-0	27.07 MJ/kg	1.60	H224
Acetamide	60-35-5	8.36 MJ/kg	1.00	
Amyl acetate	628-63-7	33.40 MJ/kg	1.40	H226
Ethyl acetate	141-78-6	20.80 MJ/kg	1.60	H225
Polyvinyl acetate (PVAC)	9003-20-7	23.04 MJ/kg	1.20 ⁽⁴⁾	
Acetylene	74-86-2	49.91 MJ/kg	1.92 ⁽⁴⁾	H220
Dissolved acetylene	74-86-2	16.72 MJ/kg	1.92 ⁽⁴⁾	H220
Acetone (0.8 kg/litre)	67-64-1	28.80 MJ/kg	1.60	H225
Acetic acid	64-19-7	14.56 MJ/kg	1.40	H226
Benzoic acid	65-85-0	26.43 MJ/kg	1.00	
Cyanacetic acid	372-09-8	16.92 MJ/kg	1.00	
Acrolein	107-02-8	29.08 MJ/kg	1.60	H225
Turpentine (essence or turpentine oil)	8006-64-2	41.80 MJ/kg	1.40	H226
Camphor	76-22-2	38.75 MJ/kg	1.68 ⁽⁴⁾	H228.2
Allyl alcohol or 2-propen-1-ol	107-18-6	33.44 MJ/kg	1.60	H225
Amyl alcohol or 1-pentanol	71-41-0	41.80 MJ/kg	1.40	H226
Butyl alcohol or 1-butanol	71-36-3	33.44 MJ/kg	1.40	H226
Ethyl alcohol (≥ 0.7 kg/litre) or ethanol	64-17-5	27.00 MJ/kg	1.60	H225
Methyl alcohol or methanol	67-56-1	22.68 MJ/kg	1.60	H225
Cotton in bales		15.48 MJ/kg	1.20	
Cotton (textile fibre)		17.40 MJ/kg	1.20	
Starch	9005-84-9	17.60 MJ/kg	1.00	
Aluminium (powder)	7429-90-5	31.04 MJ/kg	1.60	H250
Acetic anhydride	108-24-7	16.72 MJ/kg	1.40	H226
Aniline	62-53-3	36.44 MJ/kg	1.44 ⁽⁴⁾	
Anthracene	102-12-7	41.80 MJ/kg	1.20 ⁽⁴⁾	
Anthracite		32.75 MJ/kg	1.00	
Sugar	57-50-1	17.10 MJ/kg	1.00	
Cane sugar	57-50-1	16.80 MJ/kg	1.00	
Sulphur	7704-34-9	9.28 MJ/kg	1.20	
Benzine (petroleum ether)	64742-49-0	41.80 MJ/kg	1.92 ⁽⁴⁾	H225
Benzaldehyde	100-52-7	33.25 MJ/kg	1.44 ⁽⁴⁾	
Benzole or phenol	108-95-2	32.45 MJ/kg	1.44 ⁽⁴⁾	
Beryllium (powder)		66.43 MJ/kg	1.00	
Asphalt bitumen		35.28 MJ/kg	1.20 ⁽⁴⁾	
Butane (n-butane)	106-97-8	49.50 MJ/kg	1.60	H220
Coffee		16.72 MJ/kg	1.20	
Charcoal		34.20 MJ/kg	1.00	
Carbon	7440-44-0	32.80 MJ/kg	1.20	
Cardboard		16.50 MJ/kg	1.20 ⁽⁶⁾	
Rubber		39.06 MJ/kg	1.20 ⁽⁴⁾	
Nitrile rubber (NBR) or buna-N	9003-18-3	35.15 MJ/kg	1.20 ⁽⁴⁾	



Butyl rubber (IIR)	308063-42-5	45.80 MJ/kg	1.20 ⁽⁴⁾	
Celluloid (cellulose and camphor nitrate)		19.05 MJ/kg	1.40	
Cellulose	9004-34-6	16.30 MJ/kg	1.20	
Cellulose (derivatives)		29.30 MJ/kg	1.20	
Cereals		16.72 MJ/kg	1.20	
Cycloheptane	291-64-5	45.98 MJ/kg	1.60	H225
Cyclohexane or hexamethylene	110-82-7	46.58 MJ/kg	1.92 ⁽⁴⁾	H225
Cyclopentane	287-92-3	46.93 MJ/kg	1.92 ⁽⁴⁾	H225
Cyclopropane	75-19-4	49.70 MJ/kg	1.60	H220
Hard coke		29.50 MJ/kg	1.00	
Cork		26.10 MJ/kg	1.20 ⁽⁵⁾	
Leather		19.80 MJ/kg	1.00	
Diethylamine	109-89-7	41.80 MJ/kg	1.60	H225
Diethylketone or 3-pentanone	96-22-0	33.40 MJ/kg	1.60	H225
Diethylether or ethyl ether or ethoxyethane	60-29-7	36.75 MJ/kg	1.60	H224
Diphenyl or biphenyl or phenylbenzene	92-52-4	41.80 MJ/kg	1.20 ⁽⁴⁾	
Dynamite (75%) or nitrogelatin dynamite		5.40 MJ/kg	1.60	
Dipentene	138-86-3	44.31 MJ/kg	1.40	H226
Ebonite		33.44 MJ/kg	1.00	
Styrene	100-42-5	42.41 MJ/kg	1.68 ⁽⁴⁾	H226
Ethane	74-84-0	51.87 MJ/kg	1.60	H220
Amyl ether (d-n-amyl ether)	693-65-2	41.80 MJ/kg	1.20	H226
Ethylene glycol or ethanodiol	107-21-1	19.17 MJ/kg	1.00	
Coconut fibre		25.08 MJ/kg	1.20	
Phosphorus	7723-14-0	25.08 MJ/kg	1.60	H228.1
Furan	110-00-9	30.61 MJ/kg	1.60	H224
Diesel fuel		41.80 MJ/kg	1.44 ⁽⁴⁾	
Gasoline	8006-61-9	46.80 MJ/kg	1.92 ⁽⁴⁾	H224
Glycerin or glycerol	56-81-5	17.95 MJ/kg	1.00	
Edible fats		40.00 MJ/kg	1.00	
Gutta-percha		45.98 MJ/kg	1.00	
Rice flour		15.50 MJ/kg	1.20	
Rye flour		16.56 MJ/kg	1.20	
Maize flour		15.70 MJ/kg	1.40	
Wheat flour		15.90 MJ/kg	1.20	
Hay		16.72 MJ/kg	1.20	
Heptane (n-heptane)	142-82-5	48.07 MJ/kg	1.60	H225
Hexane (n-hexane)	110-54-3	48.31 MJ/kg	1.60	H225
Hydrogen	1333-74-0	141.79 MJ/kg	1.60	H220
Sodium hydride	7646-69-7	8.36 MJ/kg	1.60	
Wool (textile fibres)		23.20 MJ/kg	1.00	
Skimmed milk powder		15.50 MJ/kg	1.00	
Whole milk powder		21.00 MJ/kg	1.00	
Linseed		16.72 MJ/kg	1.20	
Linoleum		20.90 MJ/kg	1.20	
Sawn wood		12.60 MJ/kg	1.20 ⁽⁵⁾	
5 mm thick plywood		53.00 MJ/m ² ⁽⁷⁾	1.20	
Birch wood		18.70 MJ/kg	1.20 ⁽⁵⁾	
Fir wood		20.40 MJ/kg	1.20 ⁽⁵⁾	
Maple wood		17.80 MJ/kg	1.20 ⁽⁵⁾	
Beech wood		18.70 MJ/kg	1.20 ⁽⁵⁾	
Pine wood		17.80 MJ/kg	1.20 ⁽⁵⁾	
Oregon pine wood		19.60 MJ/kg	1.20 ⁽⁵⁾	
Oak wood		18.70 MJ/kg	1.20 ⁽⁵⁾	
Magnesium (powder)	7439-95-4	25.08 MJ/kg	1.60	H250
Malta		16.72 MJ/kg	1.20	
Pork lard		40.10 MJ/kg	1.00	
Butter		38.20 MJ/kg	1.00	



Margarine		32.40 MJ/kg	1.00	
Methyl methacrylate	80-62-6	27.37 MJ/kg	1.60	H225
Methane	74-82-8	55.50 MJ/kg	1.60	H220
Carbon monoxide	630-08-0	10.10 MJ/kg	1.60	H220
Naphthalene	91-20-3	40.21 MJ/kg	1.44 ⁽⁴⁾	
Tyres		27.70 MJ/kg	1.20 ⁽⁴⁾	
Nylon (average type 6, 6.6 and 11)	25038-54-5	29.88 MJ/kg	1.00	
Nitrocellulose	9004-70-0	8.36 MJ/kg	1.60	
Octane (n-octane)	111-65-9	47.90 MJ/kg	1.60	H225
Ethylene oxide or epoxyethane	75-21-8	29.65 MJ/kg	1.60	H220
Straw		15.60 MJ/kg	1.20	
Wooden pallets (standard dimensions 800 x 1 200 mm)		369.60 MJ/ud. ⁽⁷⁾	1.00	
Paper		16.50 MJ/kg	1.20 ⁽⁶⁾	
Uncompacted stacked paper		17.60 MJ/kg	1.20	
Toilet paper		17.60 MJ/kg	1.20	
Old paper		13.40 MJ/kg	1.20	
Old paper in bales		15.12 MJ/kg	1.00	
Paraffin		46.20 MJ/kg	1.00	
Pentane (n-pentane)	109-66-0	48.64 MJ/kg	1.60	H225
Petroleum (raw)	8002-05-9	43.50 MJ/kg	1.92 ⁽⁴⁾	H224
PET (polyethylene terephthalate)	25038-59-9	22.18 MJ/kg	1.00	
PMMA (polymethylmethacrylate)	9011-14-7	24.84 MJ/kg	1.00	
Polyamide (PA)	25038-54-5	28.44 MJ/kg	1.00	
Polycarbonate (PC)	25766-59-0	29.88 MJ/kg	1.20 ⁽⁴⁾	
Unsaturated polyester (UP)		27.36 MJ/kg	1.20 ⁽⁴⁾	
Mouldable polystyrene (PS)	9003-53-6	39.60 MJ/kg	1.20 ⁽⁴⁾	
Foamed polystyrene (EPS and XPS)	9003-53-6	38.00 MJ/kg	1.44 ⁽⁴⁾	
Polyethylene (PE), containers or parts	9002-88-4	43.92 MJ/kg	1.00	
Polyethylene (PE) in sheets	9002-88-4	44.50 MJ/kg	1.00	
Polyisobutylene (GDP) or poly-1-butene	9003-27-4	46.48 MJ/kg	1.20 ⁽⁴⁾	
Polyoxymethylene (POM), polyacetal	9002-81-7	15.48 MJ/kg	1.00	
Polypropylene (PP)	9003-07-0	45.36 MJ/kg	1.00	
Polyurethane (PU, PUR)	9009-54-5	28.85 MJ/kg	1.20 ⁽⁴⁾	
Mouldable polyurethane	9009-54-5	23.90 MJ/kg	1.00	
Propane	74-98-6	45.60 MJ/kg	1.60	H220
PTFE (Polytetrafluoroethylene, Teflon)	9002-84-0	5.00 MJ/kg	1.00	
PVC (rigid polyvinyl chloride)	9002-86-2	18.00 MJ/kg	1.00	
Kerosene (Jet Fuel A)	8008-20-6	46.40 MJ/kg	1.68 ⁽⁴⁾	H226
Rayon, fibres	61788-77-0	16.55 MJ/kg	1.00	
Pine resin		41.80 MJ/kg	1.20	
Polyester resin	100-42-5	19.08 MJ/kg	1.68 ⁽⁴⁾	H226
Epoxy resin (EP)	25068-38-6	29.16 MJ/kg	1.44 ⁽⁴⁾	
Phenolic resin (PF)		33.40 MJ/kg	1.20 ⁽⁴⁾	
Silk		20.90 MJ/kg	1.00	
Sisal		15.90 MJ/kg	1.00	
Sodium	7440-23-5	4.18 MJ/kg	1.60	
Carbon sulphide or carbon disulphide	75-15-0	6.34 MJ/kg	1.60	H225
Tobacco		16.50 MJ/kg	1.00	
Wood particleboard		19.20 MJ/kg	1.20	
19 mm-thick wood particleboard		295.20 MJ/m ² ⁽⁷⁾	1.20	
Tea		16.72 MJ/kg	1.00	
Tetraline (tetrahydronaphthalene)	119-64-2	42.60 MJ/kg	1.20	
Textiles		22.32 MJ/kg	1.20	
TNT (trinitrotoluene)	118-96-7	15.12 MJ/kg	1.60	H201
Toluene or toluol	108-88-3	42.43 MJ/kg	1.92 ⁽⁴⁾	H225
Peat		19.15 MJ/kg	1.00	
Urea-formaldehyde (UF), foam		14.80 MJ/kg	1.00	



Vaseline or white vaseline	8009-03-8	45.90 MJ/kg	1.00	
Viscose (items)		17.60 MJ/kg	1.20	
Viscose (fibres)		15.60 MJ/kg	1.20	
Whitespirit	64742-81-0	43.50 MJ/kg	1.68 ⁽⁴⁾	H226
Xylene	1330-20-7	40.00 MJ/kg	1.68 ⁽⁴⁾	H226

Table Notes:

Note 1: 'CAS No.' is the registration number of the Chemical Abstract Services of the American Chemical Society. It is included in the table for informational purposes only to assist in the identification of the material.

Note 2: As an alternative to the use of Table 1.3.2, this table includes the C_i values of various materials.

Note 3: The column 'CLP' includes the H phrases according to Regulation (EC) No 1272/2008. It is included in this table for information purposes only.

Note 4: Eminently smoke-producing materials.

Note 5: A value of 1 can be taken if it is justified that they are compact pieces of large dimensions.

Note 6: A value of 1 may be taken if it is justified that it is compacted paper or cardboard (e.g.: books, coils, stacks, etc.).

Note 7: In these cases the heat value is given in units other than MJ/kg to facilitate the calculation. This must be taken into consideration in order to be able to apply the expressions. Thus, to obtain the value of the fire load, it must be multiplied by the corresponding unit (product units or dimensions in m²) instead of by mass (kg).

Table 1.3.4.
CRITERIA FOR DETERMINING THE VALUE OF THE 'R' COEFFICIENT
OF A FIRE SECTOR OR AREA

R	Circumstances
0.8	R will be 0.8 in fire sectors or areas dedicated exclusively to low-height storage (maximum 2.50 m) and limited floor area (less than 50 m ²). For the purpose of determining this area, it is not necessary to take into account storage of smaller surface areas, separated from each other by means of a free space around them of not less than 2.5 m or with compartmentalising elements of resistance EI 30 or greater. Notwithstanding the above, a value of 0.8 for R cannot be used when there are activities where Table 1.3.5 (column R _{min}) specifies a higher value.
1	R shall be 1 by default, provided that the circumstances to be a different value do not apply, which must be duly justified.
1.4	R shall be 1.4 when in the fire sector or area one of the following situations is met:

	<p>a) When the activities carried out in the fire sector or area, or the conditions thereof, entail a significant increase in the probability of a fire starting, due to sources of a thermal, chemical or equivalent nature. For example: regular jobs involving sparks or open flames. Also R will be at least 1.4 in the event that it develops in any of the activities marked in Table 1.3.5 as such (column R_{min}).</p> <p>b) When there are areas where the distribution of materials means that, in the event of a possible fire, it can spread quickly. For example: storage of combustible materials of a height of more than 5 m, that occupy a significant surface area (equal to or greater than 100 m²). For the purpose of determining this area, it is not necessary to take into account storage of smaller surface areas, separated from each other by means of a free space around them of not less than 5 m or with compartmentalising elements of resistance EI 30 or greater.</p>
1.8	R shall be 1.8 when in the fire sector or area the two situations (a) and (b) mentioned in the upper row are met simultaneously. For example, because you have a work area with flames and a storage area where the fire can spread quickly.

Table 1.3.5.

VALUES OF THE MEDIUM FIRE LOAD DENSITY OF MANUFACTURING ACTIVITIES (q_s), STORAGE ACTIVITIES (q_v) AND THEIR ASSOCIATED COEFFICIENTS (C_i , R_{min})

ACTIVITY	Production	Raw Storage ⁽¹⁾	Net Storage ⁽²⁾	C_i	R_{min} ⁽³⁾
	q_s (MJ/m ²)	q_v (MJ/m ³)	q_v (MJ/m ³)		
A. OFFICES					
Offices	700			1.44	1
Meeting rooms, conference rooms	300			1.44	1
Archives		1 600	2 100	1.20	
B. CARDBOARD, PAPER					
Cardboard/ corrugated cardboard factory:					
Storage of raw materials		1 700	2 200	1.20	
Storage in reels		3 700	14 700	1.20	
Production, processing	1 500			1.20	1
Paper factory:					
Storage of raw materials (cellulose)		20 000	22 000	1.00	
Bulk storage (old paper, pressed paper)		6 900	8 600	1.20	
Bulk storage (old paper, loose paper)		2 800	4 000	1.40	
Production, processing	from 200 to 1 200 (700) ⁽⁶⁾			1.20	1
Storage of finished product		2 800	5 100	1.20	
Printing press:					
Paper storage in rolls		4 200	6 200	1.20	



Production	500			1.68	1.4
Production with premises for unwinding paper	2 100			1.68	1.4
Dispatch, packing		from 200 to 2 400 (1 800) ⁽⁶⁾	from 300 to 3 000 (2 500) ⁽⁶⁾	1.20	1
Binding	2 400			1.20	1
C. FOOD INDUSTRY					
Non-alcoholic (or low alcohol content) drinks:					
Filling	350			1.20	1
Storage		600	900	1.20	
Other specific drinks:					
Wineries (wines)	80			1.00	1
Alcoholic beverages (liqueurs)	700			from 1.20 to 1.40	1
Alcoholic beverages, storage		800	-	from 1.00 to 1.40	
Chocolate:					
Storage of raw materials (including packaging)		5 200	8 200	1.44	
Production, conching	1 200			1.20	1
Storage of finished product, dispatch		1 800	2 900	1.44	
Food trade:					
Storage of fresh products, dispatch		900	1 800	1.20	
Packaging storage		1 800	2 400	1.20	
Packaging, cutting of meat	1 900			1.20	1
Manufacture of dairy products:					
Cheese production	300			1.00	1
Cheese storage		1 100	1 600	1.00	
Grains (flour mill):					
Flour storage		3 900	5 300	1.20	
Flour production	1 100			1.20	1.4
Fats, oils, butter:					
Production of fats, oils	8 500			1.68	1.4
Storage of fats, oils, butter		5 300	7 900	1.68	
Pasta products:					
Production of pasta products	700			1.20	1.4
Storage of pasta products		1 800	2 700	1.20	
Bakery and pastry products:					
Storage of raw materials		1 500	2 800	1.20	
Production	500			1.44	1.4
Storage of finished product, dispatch		2 000	2 200	1.44	
Sugar:					
Production, packaging	200			1.20	1
Storage		4 600	6 300	1.20	



Frozen:					
Production	800			1.00	1.4
Warehouse		375	-	1.00	
D. CHEMICAL INDUSTRY					
General chemical industry:					
Production	from 500 to 7 800 ⁽⁵⁾			1.68	1.4
Storage, solvents		from 1 800 to 6 800 ⁽⁵⁾	-	1.92	1
Storage, epoxy resin		3 800	5 000	1.44	
Pharmaceuticals:					
Production	900			1.68	1.4
Storage		1 800	2 500	1.68	
E. LOGISTICS					
Distribution centres:					
Multi-product storage (generic)		from 300 to 8 100 ⁽⁷⁾	from 400 to 16 200 ⁽⁷⁾	1.44	
Storage of garden products		1 500	3 100	1.44	
Storage of electrical appliances		1 000	1 600	1.44	
Storage of furniture (excluding metal)		1 800	2 800	1.44	
F. MISCELLANEOUS MATERIALS AND GOODS					
Car accessories:					
Spare parts warehouse		800	1 300	1.44	
Liquid storage (oils, cleaners, solvents)		1 200	3 000	1.68	1
Tyre warehouse		1 000	1 500	1.44	
Fodder:					
Compound food production	1 400			1.20	1.4
Storage of compound foods		1 300	2 000	1.20	
Household appliances:					
Production and packaging	150			1.44	1
Storage		1 000	1 600	1.44	
Waste recycling:					
Special waste (paints, solvents)		2 500	6 100	1.68	1
Special waste (acids)		1 300	2 800	1.20	
Plastics recycling, warehouse		3 800	6 000	1.44	
Plastic recycling, production	1 200			1.44	1
Wood chips and cuttings		1 500	2 100	1.20	
Building materials:					
Silicocalcarous bricks	350			1.00	1
Concrete	300			1.00	1
Wood		1 600	3 200	1.20	



Synthetic insulation materials: foamed polystyrene (EPS and XPS)		600	700	1.44	
Sale of construction items		900	1 500	1.44	1
Glass production:					
Packing	350			1.20	1
Storage		150	200	1.20	
Tobacco products:					
Production	500			1.44	1
Storage (tobacco, cigarette factory)		1 400	1 900	1.44	
G. TEXTILES					
Fabrics for dressmaking and upholstery, apparel:					
Storage		400	800	1.44	
Carpet factory:					
Production	2 500			1.44	1
Production, dyed	300			1.20	1
Storage		1 100	1 800	1.44	
Yarn:					
Production	600			1.44	1
Storage		3 200	4 300	1.44	
Fabrics:					
Production	250			1.20	1
Storage		1 100	1 400	1.20	
H. METAL PROCESSING					
Car construction:					
Production: Cars, garrison	700			1.44	1
Production: Cars, assembly	300			1.44	1
Production: Cars, paint	500			1.44	1
Production of special vehicles (cleaning, armoured, etc.)	400			1.44	1
Storage		600	900	1.44	
Metal construction:					
Storage of paints, powder coatings		1 800	3 300	1.68	1
Painting using a spray gun	100			1.92	1.4
Production, galvanised	250			1.00	1
Storage		150	200	1.00	
Manufacture of machines:					
Metal work	250			1.00	1
Storage, dispatch		100	150	1.20	
Watches:					
Production	300			1.00	1
I. PROCESSING OF PLASTICS					
Cable factory:					
Production	1 000			1.44	1



Storage of finished product		3 000	6 200	1.44	
Sheet and tarpaulin factory:					
Production	1 300			1.44	1
Storage of finished product		1 600	2 400	1.44	
Synthetic materials:					
Storage of raw materials (granules)		4 700	8 000	1.44	
PET bottles, injection moulding	800			1.44	1
PET bottles, storage		700	1 300	1.44	
Polystyrene, cut	300			1.44	1
Polystyrene, storage		300	450	1.44	
Foam storage (padded, mattresses)		400	700	1.44	
Injection moulding:					
Production	1 000			1.44	1
Storage of finished product		1 700	2 100	1.44	
Rigid foam panels:					
Production	1 600			1.44	1
Storage of finished product		1 700	3 100	1.44	
Pipes, ducts:					
Production	1 000			1.44	1
Storage of finished product		2 200	3 500	1.44	
J. WOODEN GOODS					
Carpentry:					
Pure production ⁽⁴⁾	900			1.20	1
Production room with temporary storage	1 700			1.20	1
Storage		2 200	3 200	1.20	
Sale of wooden goods:					
Waste	5 000			1.20	1
Storage		1 900	5 300	1.20	
Briquettes (pellet):					
Storage		11 600	16 600	1.20	
Particle board:					
Production of particulate panels	1 200			1.20	1
Storage		5 600	9 000	1.20	
Construction and interior carpentry:					
Pure production ⁽⁴⁾	900			1.20	1
Production with temporary storage	1 800			1.20	1
Storage		1 800	2 800	1.20	
Manufacture of upholstered furniture	550			1.44	1.4
Lacquering of furniture	550			1.92	1.4



Sawmill:					
Sawmill	1 500			1.20	1
Sawn wood warehouse		2 400	4 900	1.20	
K. OTHERS ⁽⁸⁾					
Repairers	400			1.44	1
Cinema	300			1.00	1
Pharmacy (including warehouse)	800			1.40	1
Jewellery (sale)	300			1.20	1
Toy shop (sale)	500			1.44	1
Laundry	200			1.20	1
Bookstore (sale)	1 000			1.20	1
Bakery (sale)	300			1.20	1
Stationery shop (sale)	700			1.20	1
Perfumery (sale)	400			1.20	1
Restaurant	300			1.20	1
Dry cleaner	500			1.44	1
Electrical or electronic equipment (sale)	400			1.20	1
Sporting goods (sale)	800			1.44	1
Baby strollers (sale)	300			1.20	1
Candy and sweets (sale)	400			1.00	1
Household appliances (sale)	300			1.44	1
Furniture (exhibition and sale)	400 to 600			1.44	1
Clothing (sale)	600			1.20	1
Shoe store (sale)	500			1.44	1
Stationery items		1 100	-	1.20	
Perfume items		500	-	1.20	
Articles of rubber		5 000	-	1.44	
Library (book storage)		2 000	-	1	
Footwear		400	-	1.44	
Candy and sweets		1 500	-	1.20	
Cardboard packaging		2 500	-	1.20	
Preserved products		375	-	1.00	
Cosmetics		500	-	1.20	
Compact discs and the like		3 400	-	1.20	
Artificial flowers		200	-	1.44	
Toys		800	-	1.44	
Office supplies		1 300	-	1.44	

Table Notes:

Note 1: When using the q_v value of 'raw storage' the surface area S_i to be applied should correspond to the warehouse surface area, including the space where the stored products are



physically (shelves, etc.) and also including adjacent aisles necessary for the performance of the storage activity.

Note 2: When using the q_v value of 'net storage', the surface area S_i should correspond to the area strictly occupied by the stored products (shelves, etc.) without including the adjacent aisles necessary for the performance of the storage activity.

Note 3: The value of R_{min} in this table should be read in conjunction with Table 1.3.4. This means that the value of R to be applied will at least be marked as R_{min} and that it may have to be increased when applying the criteria in Table 1.3.4.

Note 4: Areas of 'pure production' do not include stockpiles or intermediate deposits.

Note 5: In the chemical industry, fire loads differ greatly from one industry to another, so each specific case must be studied and the value chosen must be justified.

Note 6: In these activities the fire loads differ greatly from case to case, so each specific case must be studied. The proposed value is indicated in parentheses and, if another value is chosen, it must be justified.

Note 7: In logistics, multi-product storage (generic), fire loads differ greatly from case to case, so each case should be studied and the value chosen should be justified. In any case, it is understood that values below 700 MJ/m^3 (raw) or $1\,300 \text{ MJ/m}^3$ (net) are rare for this activity, and may be used only in storage where the products expected to be stored, even temporarily, are mostly not very flammable, it must be justified that these products are assimilated to activities that individually have values below 700 MJ/m^3 (raw) or $1\,300 \text{ MJ/m}^3$ (net) according to the table.

Note 8: The activities included in this section do not necessarily have to be industrial activities, but are included for information purposes.



ANNEX II CONSTRUCTION REQUIREMENTS FOR INDUSTRIAL ESTABLISHMENTS

The construction requirements to be met by industrial establishments in relation to their fire safety are described below. These requirements shall depend on the characterisation carried out previously in accordance with Annex I.

I. TERMS AND DEFINITIONS

The following definitions are established:

- a) **Accessible façade:** Accessible façades of a building or industrial establishment are considered to be those that have gaps allowing access from the outside to personnel of the Firefighting and Rescue Services, with said gaps having to comply with the conditions set out in Part 4, section 2 of this Annex.
- b) **Load-bearing structure:** The load-bearing structure of a building shall be understood to mean a structure consisting of the following elements: top slab, beams, supports and main and secondary roof structure.
- c) **Light cover:** A light cover is a cover as defined in Table 3.1 of section 3.1.1 of the Basic Document 'Structural Security Actions in Building' (DB-SE-EA) of the CTE.

Additionally, the following definitions from the CTE DB-SI, in annex SI A thereto, 'Terminology' will be adopted:

- i. Evacuation height.
- ii. Staircase open to the outside.
- iii. Specially protected staircase.
- iv. Protected staircase.
- v. Safe outdoor space.
- vi. Origin of evacuation.
- vii. Protected corridor.
- viii. Response to fire.
- ix. Evacuation route.
- x. Alternative evacuation routes.
- xi. Fire resistance.
- xii. Building exit.
- xiii. Emergency exit.
- xiv. Floor exit.
- xv. Underground sector.
- xvi. Fire lobby.
- xvii. Zero occupancy zone.
- xviii. Shelter area.



II. Conditions of fire behaviour of construction products and building elements

This annex sets out the fire-behaviour requirements (fire resistance and response to fire) to be met by construction products and building elements.

Those requirements are based on the European classifications of resistance or reaction to fire (Euroclasses) and are defined by establishing the minimum performance that products must achieve for the relevant essential characteristics, as provided for in the European Construction Products Regulation (EU) No 305/2011, for CE marked products.

In the absence of a CE marking, this classification will be obtained in accordance with Royal Decree 842/2013 of 31 October adopting the classification of construction products and building elements according to their fire reaction and fire resistance properties.

Alternatively, in order to determine the fire resistance characteristic of the structures and elements, the provisions of section 1 'Generalities' and section 6 'Determination of fire resistance' of Part SI 6 of CTE DB-SI and annexes C to F cited there may also be followed.

III. Non-permitted locations

The location of fire sectors in the buildings of industrial establishments is not allowed in the following situations:

- a) **High** intrinsic risk, in configurations of type A_v , except in the cases listed in Table 2.1.1.
- b) **High level 8** intrinsic risk, in configurations of type A_H or Type B, except in the cases listed in Table 2.1.1.
- c) Medium intrinsic risk, in sectors on **underground floors**, in configurations of type A_v . In addition, in the case where the same sector has parts above and below ground, the part that is below ground cannot be of a medium intrinsic risk, the risk of that part being calculated in accordance with Annex I and taking into account the fire load and the surface area of that part below ground.
- d) High intrinsic risk, in sectors on **underground floors**, in configurations of type A_H . In addition, where the same sector has parts above and below ground, the part that is below ground cannot be of a high intrinsic risk, the risk of that part being calculated in accordance with Annex I and taking into account the fire load and the surface area of that part below ground.
- e) Any risk level, on **the second underground floor**, or floors below this.
- f) Medium intrinsic risk, in configurations of type A_v , when the length of the **accessible façade** is less than 5 m.
- g) Medium or high intrinsic risk, in type A_H or Type-B configurations, when the length of **accessible façade** is less than 5 m.



- h) Of medium or low intrinsic risk, on a ground level whose **evacuation height** is greater than 15 m, in configurations of type A_v.
- i) High intrinsic risk, on an above-ground floor whose **evacuation height** is greater than 15 m, in configurations of type A_H or Type B.

Part 1. Internal spreading

1. Compartmentalisation of industrial establishments

1.1. Industrial establishments must be compartmentalised in fire sectors (when located in buildings) or in fire areas (when located in open spaces) as indicated in this section.

1.2. Any industrial establishment must constitute at least one fire sector or, where applicable, a fire area.

1.3. The maximum permissible built surface area of each fire area shall be as shown in the table below. This maximum surface area will depend on the level of intrinsic risk of the sector and the type of configuration to which it belongs.

Table 2.1.1.
MAXIMUM PERMISSIBLE BUILT SURFACE AREA OF EACH FIRE SECTOR

Intrinsic risk level	Configuration			
	Type A _v (m ²)	Type A _H (m ²)	Type B (m ²)	Type C (m ²)
Low 1	2 000	6 000	12 000	NO LIMIT
Low 2 <i>(Notes)</i>	1 000 <i>(1.a) (2) (3)</i>	4 000 <i>(1.b) (2) (3)</i>	8 000 <i>(1.b) (2) (3)</i>	12 000 <i>(1.b) (2) (3) (4)</i>
Average 3	500	3 500	7 000	10 000
Average 4	400	3 000	6 000	8 000
Average 5 <i>(Notes)</i>	300 <i>(2) (3)</i>	2 500 <i>(1.b) (2) (3)</i>	5 000 <i>(1.b) (2) (3)</i>	7 000 <i>(1.b) (2) (3) (4)</i>
High 6	NOT ADMITTED <i>(5)</i>	2 000	4 000	6 000
High 7		1 500	3 000	5 000
High 8 <i>(Notes)</i>		NOT ADMITTED <i>(1.b) (3) (5)</i>	NOT ADMITTED <i>(1.b) (3) (5)</i>	4 000 <i>(1.b) (3) (4)</i>

Table Notes:

Note 1.a If the fire area is located below street level, the maximum permissible built surface area shall be 400 m², which can be increased by application of Notes 2 and 3. In the case where the



same sector has parts above and below ground, the built surface area limitation of this note shall apply only to the part below ground.

Note 1.b If the fire area is located at low street level, the maximum permissible constructed surfaces indicated in the table shall be divided by two and may be increased by application of Notes 2 and 3. In the case where the same sector has parts above and below ground, the built surface area limitation of this note shall apply only to the part below ground.

Note 2: If the accessible façade of the industrial establishment is equal to or greater than 50 percent of its perimeter, the maximum permissible built areas, indicated in the table, may be multiplied by 1.25.

Note 3: Where fixed automatic sprinkler firefighting systems are installed covering the entire sector, the maximum permissible built areas indicated in the table may be multiplied by 2. Alternatively, instead of sprinklers, the use of other fixed automatic firefighting systems will also be accepted when these systems are appropriate for the place and risk to be protected.

Notes 2 and 3 can be applied simultaneously. Thus, if these two situations were to coincide, the factor for increasing the maximum surface area of the fire area would be 2.5.

Note 4: In Type-C configurations, the fire area can have any surface area, provided that the entire sector has a fixed automatic extinguishing system and the distance to other establishments, as well as the limits of plots with the possibility of building on them, is greater than 10 m, free of combustible goods or intermediate elements capable of spreading fire.

In the case of two adjoining establishments, these 10 m can be divided between them provided that there is a binding and permanent agreement between them in order to keep that space free of buildings and combustible goods. On the other hand, in the 10 m there may be vegetation, parked vehicles and other specific elements provided that the approach roads and the manoeuvring spaces referred to in section 4 are not damaged. In addition, to determine the mentioned distance of 10 m, the space of the public road can also be counted.

Note 5: By way of derogation from the table, high intrinsic risk sectors may be implemented in buildings of type A_v and high intrinsic risk level 8 in buildings type of A_H or B if the following requirements are met:

- a) They are intended exclusively for storage, or do not co-exist with activities in the same sector that entail a significant increase in the probability of a fire starting.
- b) In buildings of type A_v or A_H , the structure, walls and upper enclosures (decks, etc.) delimiting the fire sector will be independent of those of the rest of the building.
- c) The sector cannot be below ground, its evacuation height should not exceed 15 m and the establishment must have an accessible façade of at least 5 m.
- d) The maximum surface area of the sector will be 300 m^2 in buildings of type A_v . On the other hand, in types A_H or B it will be 300 m^2 and can be extended to $1\,500 \text{ m}^2$ in type A_H and $3\,000 \text{ m}^2$ in type B if all of the following systems are available: fixed automatic extinguishing system, fire detection and alarm system with devices both for automatic activation as well as for manual activation (hand-held detectors and push-buttons) and smoke and heat control system according to section 8.3 of Annex III. (These surface values are maximum values, the rest of the notes in this table cannot be applied).



e) It must have at least an equipped fire hydrant (BIE) if its surface is greater than 25m², either placed inside it, or placed on the outside near the entrance (in small sectors), so that it can reach the interior.

f) For the other requirements set out in Annexes II to IV, the sector shall comply with the requirements for high intrinsic risk sectors in buildings of type A_H, except Note 4 to Table 2.1.2 and section 5 1.3.2 of Annex II which cannot be applied in sectors located in buildings of type A_V.

1.4. The fire resistance of building elements delimiting one fire sector from another, such as walls and roofs, shall not be less than that indicated in the following table:

Table 2.1.2.
FIRE RESISTANCE OF BUILDING ELEMENTS THAT DELIMIT FIRE SECTORS

Intrinsic risk level	Type A _V		Type A _H		Type B		Type C	
	Floor below ground (basement)	Floor above ground	Floor below ground (basement)	Floor above ground	Floor below ground (basement)	Floor above ground	Floor below ground (basement)	Floor above ground
Low risk	EI 120	EI 90	EI 120	EI 90	EI 90	EI 60	EI 60	EI 30
Medium risk	NOT ADMITTED	EI 120	EI 180	EI 120	EI 120	EI 90	EI 90	EI 60
High risk	NOT ADMITTED	NOT ADMITTED	NOT ADMITTED	EI 180	EI 180	EI 120	EI 120	EI 90

Table Notes:

Note 1: E = Integrity to the passage of flames and hot gases, I = Thermal insulation, R = Load-bearing capacity (values expressed in minutes).

Note 2: Where the separating elements also have a bearing function, they shall have at least the respective REI values, according to the values indicated in the table.-

Note 3: Doors or gates whose main objective is the passage of persons or vehicles and which share fire sectors, must have a fire resistance (EI₂), at least equal to half of that required for the element separating both fire sectors, or, a quarter of that when the passage is made through a previous lobby and two doors. Such reductions in fire resistance shall not apply to doors or gates that are not easily operable manually, or to doors whose dimensions are greater than 3 m wide or 4 m high, in which case it may be halved when the passage is made through a previous lobby and two doors. In the case of other types of mobile partitioning elements expressly installed for the effective sectoring of the sectors concerned (such as gates) they shall not be assimilated to passing doors for the purpose of reducing their fire resistance.

Usable pedestrian doors that share sectors must have a C5 automatic locking system or at least C3 when it is expected that the door will normally remain in an open position and have an electrically operated retaining device. The automatic locking systems of these doors must consist of a device



according to UNE-EN 1154. Two-leaf doors must also be equipped with a coordination device for these sheets in accordance with UNE-EN 1158. In the case of other door types that share sectors, as well as other types of mobile partitioning elements, they should also have an equivalent automatic locking system.

Usable pedestrian doors that share sectors intended to remain normally in an open position must have an electrically operated retaining device in accordance with standard UNE-EN 1155. In addition, other types of doors or mobile partitioning elements intended to remain normally in an open position should also have an equivalent retainer system that allows automatic closing in the event of fire.

Note 4: In buildings on a single floor and with a light roof covering, where the total surface area of the fire area is protected by a fixed automatic extinguishing system and a smoke and heat control system according to section 8.3 of Annex III, the values in Table 2.1.2 may be reduced to the following values:

Table 2.1.3.

Intrinsic risk level	Type A _H	Type B	Type C
Low risk	EI 60	EI 30	EI 30
Medium risk	EI 90	EI 30	EI 30
High risk	EI 120	EI 30	EI 30

Note 5: Lifts that connect different fire sectors will be compartmentalised. The lifts will have at each access, either E 30 doors or fire lobby with an EI₂ 30-C5 door. When, considering two sectors, the lowest is a low-risk sector level 1, or if it is not, it is chosen to have both a door EI₂ 30-C5 access to the elevator's fire lobby and an E 30 door for access to the lift, in the higher sector none of these measures are required.

1.5. Fire areas in open spaces of type D configuration (except those with low risk level 1), shall be separated from other areas of the same establishment by means of one of the following options:

- a) By means of a minimum separation of 5 m between the perimeter of the area and the combustible materials stored in it that can spread a fire. In the case of a storage space of combustible materials of a height greater than 5 m, the separation between them and the perimeter of the area shall be extended to the same distance as that height. In the event that the mentioned separation is between two areas of the same establishment, such separation shall be allowed to be divided between the two areas.

The indicated perimeter separation shall be uncovered to allow rapid dissipation of heat and smoke, unless it is documented that the cover does not harm this objective and that the criteria for openings set out in Annex I for Type D configuration are met.

- b) Where the separation indicated in the preceding paragraph does not exist between the perimeter of the area and the combustible materials stored therein, compartmentalising elements must exist to ensure a minimum fire resistance of 60, 90 or 120 in areas of low, medium or high risk respectively (or REI 60, 90 or 120 if they have a bearing function) in such a way as to ensure the non-spreading of the fire in the area concerned. Where such compartmentalisation is carried out by means of vertical separators located within the perimeter of the area, such as walls, they shall have a height of at least 1 metre higher than the height of



the stored combustible materials and shall be extended by 1 metre in horizontal projection at their lateral ends.

In the event that a part of the perimeter of the area is adjacent to a part of a façade of a building and there is no separation to the combustible materials, that part of the façade must also have the aforementioned fire resistance (EI or REI) and the dimensions indicated above. In addition, in the case of having a height higher than that indicated, it cannot have areas whose fire resistance is less than the IS or REI requested up to at least 5 m above the height of the stored combustible materials, and this height may justifiably be reduced to a minimum of 1 metre above the height of the materials, provided that it is justified that, due to the characteristics of the stored material (due to its small quantity, low combustibility, arrangement, etc.), such separation is sufficient to prevent the propagation.

In the case of doors on the façade that require fire resistance, the same considerations as in note 3 to Table 2.1.2 may be applied.

- c) In the case of fire areas with areas with loading docks, car parks, small porches, regular movements of materials in transit located at the exit of a building, as well as other similar activities, if it is not possible to make the separation indicated in the previous headings with respect to the buildings of the industrial establishment concerned, actions will be taken to consider the possible risk that these activities may generate, in this case the equipped fire hydrants, hydrants or extinguishers that may be required according to Annex III (both inside and outside the buildings), must be located in such a way that they can act in the event of fire in these areas.

1.6. In fire areas in open spaces (type-D configuration), the distribution of combustible materials shall meet the following requirements:

- a) For solid materials, or packaged materials, stored by stacking them on top of each other (or grouped, stacked, bulked or otherwise equivalent):
- i. Maximum surface area of each stack: 500 m².
 - ii. Maximum volume of each stack: 3 500 m³.
 - iii. Maximum height of each stack: 15 m.
 - iv. Maximum length of each stack: 20 m. If the width of the corridor between stacks is greater than or equal to 2.5 m, the maximum length shall be 45 m.
 - v. Minimum stack spacing: 1.5 m.
 - vi. Every 65 m of storage there shall be a stack spacing of at least 5 m wide. If the height of the stack is greater than 5 m, this separation shall be extended to the same distance as that height.
- b) In other cases, the materials must be fitted ensuring that the spread of the fire is limited and to facilitate extinguishing, so that a result equivalent to that referred to in point (a) is achieved. This particularity must be justified.

2. Concealed spaces. Passage of installations through fire compartmentalisation elements

2.1. The fire compartmentalisation of the sectors must have continuity in the concealed spaces, such as brackets, chambers, false ceilings, raised floors, underground galleries (channels or ducts) of all types of installations etc., except when these are compartmentalised from the former with at least the same resistance to fire, this can be reduced by half in the records for maintenance and in the sealing of pipe passage holes of non-flammable and combustible liquids.

2.2. The fire resistance required for fire compartmentalisation elements must be maintained at the points where these elements are crossed by elements of the installations, such as cables, tubes, pipes, ventilation ducts, etc., excluding penetrations whose passage section does not exceed 50 cm². To do this, one of the following alternatives can be chosen:

a) To have an element that, in the event of fire, automatically obstructs the passage section and guarantees at that point a fire resistance at least equal to that of the traversed element, such as an automatic fire gate EI t (i↔o) t being the fire resistance time required for the traversed compartmentalisation element, or an intumescent shutter device, for example, in the case of pipes that cross a fire area and are made of combustible material or fuse, where the sealing system must ensure that the internal space that leaves the pipe when melting or burning is also sealed.

b) Bushing elements that provide a resistance at least equal to that of the traversed element. For example, ventilation ducts EI t (i↔o) t being the fire resistance time required for the compartmentalised element. In this way, systems that include ducts, both vertical and horizontal, that pass through compartmentalisation elements and whose function does not allow the use of gates (smoke extraction, ventilation of escape routes, etc.), must be resistant to fire or be adequately protected throughout their journey with the same degree of fire resistance as traversed elements.

In the case of brackets, these can be considered as sufficiently watertight (and therefore whose downsides would not be required to qualify for a reaction to fire) if they are delimited by an enclosure that, at least, has the required resistance to fire for the elements (sectors) it passes through, even at the points where such enclosure is crossed by installations whose passage section exceeds 50 cm², and whose records, if any, have at least 50% of that resistance to fire.

With regard to fire-resistant records that may exist in brackets or ducts of installations, it is not mandatory that they have an automatic locking system, since these must always remain closed and their use is limited only to maintenance tasks.

3. Fire response of those of the constructive elements

3.1. Products used as coating or surface finish must have at least the following performances:

Table 2.1.4.
CLASSES OF FIRE RESPONSE OF CONSTRUCTIVE ELEMENTS

Status of the element	Coatings ⁽¹⁾
-----------------------	-------------------------



	Ceilings and walls ^{(2) (3) (7)}	Flooring ⁽²⁾
Occupancy areas, in general ⁽⁴⁾	C-s2,d0	C _{FL} -s1
Protected corridors and stairs	B-s1,d0	C _{FL} -s1
Parking areas and high intrinsic risk level sectors ⁽⁵⁾	B-s1,d0	B _{FL} -s1
Concealed non-tight spaces, such as brackets, false ceilings and elevated floors, etc., or which are watertight, contain installations likely to start or spread a fire	B-s3,d0	B _{FL} -s2 ⁽⁶⁾

Table Notes:

Note 1: Provided that they exceed 5% of the total surfaces of the walls, of all the ceilings or of all the floors of the site concerned.

Note 2: Includes pipes and ducts that run through the indicated areas without fire-resistant coating. In the case of pipes with linear thermal insulation, the class of reaction to fire shall be as indicated, but incorporating sub-index L.

Note 3: Includes those materials that constitute a layer contained inside the ceiling or wall and which is not protected by a layer that is at least EI 30. (This applies to the multilayer elements formed in the work itself by superimposing one material, or layer, to another. In the case of multilayer construction products that are tested and manufactured as such, the same requirement also applies to them, considering that these products already have the classification of their reaction to fire as an integrated product, so it will be this classification that must be taken into account).

Note 4: It includes, both those of permanence of persons, as well as those of circulation that are not protected.

Note 5: Note that Article 4 of the Regulation, 'Regulatory Compatibility', stipulates that, for car parks, from a certain area the technical requirements of CTE DB-SI shall apply.

Note 6: It refers to the lower part of the cavity. For example, in the chamber of the false ceilings refers to the material located on the upper face of the membrane. In spaces with clear vertical configuration (e.g. brackets) as well as when the false ceiling is constituted by an open lattice, grid or frame, with an acoustic, decorative function, etc., this condition is not applicable.

Note 7: For skylights in general and natural smoke and heat extraction aerators installed on decks, the same requirements as ceilings and walls shall apply. However, large dimension skylights in covers will always be class B-s1,d0 or more favourable. For the purposes of the provisions herein, they are to be understood as skylights to those elements isolated or integrated in the roof, formed by transparent or translucent materials that allow light to enter the building. Skylights which are more than 10 m in length are to be deemed as large skylights or, where there are several clustered skylights which are less than 2 m apart and occupy more than 10 m in length.

3.2. Products inside false ceilings or high floors, whether used for thermal insulation and for acoustic conditioning and those constituting or carrying air conditioning or ventilation ducts, etc., must be of Class B-s3,d0 or more favourable.

For products included in walls and enclosures constituting a layer contained in a floor, wall or ceiling, the provisions of note 3 to the table above shall apply.



3.3. Cables located inside false ceilings or raised floors shall be at least of class C_{ca}-s1b,d1,a1. In the case of underground galleries, the cables located in them must also comply with these features, unless such galleries are compartmentalised.

The rest of the cables must comply with the performance that for them is established in the specific regulation that is applicable to them.

3.4. The fire-response requirements for other components of electrical installations (wire conduction systems such as tubes, trays, protective channels or closed non-circular section ducts) are regulated in their specific regulations.

4. Technical service facilities

4.1. Installations of electrical services (including own generation, distribution, taking, transfer and consumption of electrical energy), thermal energy installations from solid fuels, liquid or gaseous (including storage and distribution of fuel, appliances or equipment for consumption and thermal conditioning), refrigeration facilities, mechanical energy use facilities (including generation, storage, distribution and apparatus or equipment for compressed air consumption) and materials, maintenance and elevators of industrial establishments shall comply with the requirements established by the current regulations that specifically affect them.

4.2. In the case of electrical cables feeding non-autonomous service equipment or circuits, which are to remain in operation during a fire, they shall be protected to maintain the electrical current for at least the time for which the equipment is intended to operate. This protection can be achieved through different technical solutions, such as the use of fire resistant ducts or building elements, or by the use of cables with intrinsic fire resistance.

In the latter case (unprotected cables that must have intrinsic resistance to fire), cables tested in accordance with UNE-EN IEC 60331-1 or UNE-EN 50200 may be used, taking as a reference those that are at least class P90 or PH90, or otherwise, if it is justified that a different operating time is required, and unless the specific legislation indicates otherwise.

Particular attention should be paid to the installation conditions and systems to be used, so that in the event of fire and during the time the cable is to ensure continuity of supply, it provides reliable and safe support.

Part 2. External spreading

1. Dividing walls, walls, top slabs and façades of buildings

1.1. In order to limit the risk of fire spreading in buildings to other establishments, the minimum fire resistance of the separating elements of the fire sectors of the establishment concerned with the other establishments, such as dividing walls, walls, enclosures or top slabs, shall be as follows:

Table 2.2.1

FIRE RESISTANCE OF SEPARATING ELEMENTS WITH OTHER ESTABLISHMENTS



Intrinsic risk level	
Low risk	EI 120
Medium risk	EI 180
High risk	EI 240

Table Notes:

Note 1: E = Integrity to the passage of flames and hot gases, I = thermal insulation, R = load-bearing capacity (values expressed in minutes).

Note 2: Where the separating elements also have a bearing function, they shall have at least the respective REI values, according to the values indicated in the table.-

Note 3: Doors acting as separators shall be subject to the same considerations as in note 3 to Table 2.1.2.

Note 4: In the case of two adjoining establishments (typically in adjacent or nearby buildings, in type B configurations) where there are two walls or enclosures together, or at a distance of up to 3 m between them, the fire resistance of the wall or enclosure of the industrial establishment concerned shall be allowed to be reduced to the values indicated in Table 2.1.2, and must in any case have a value of at least 120 IA regardless of their intrinsic risk level. On the other hand, this requirement shall not apply where the separation distance exceeds 3 m, free of combustible goods or intermediate elements capable of spreading the fire, in which case a minimum resistance will not be required.

1.2. Where two buildings in the same industrial establishment are at a separation distance equal to or less than 3 m, they shall be considered as the same fire area unless there are separating elements between the two that comply with the requirements of separating walls between fire sectors, as set out in Table 2.1.2 (or in Table 2.1.3 when applying Note 4 to Table 2.1.2 in both buildings).

1.3. In order to limit the risk of horizontal external spreading of the fire through the façade between fire sectors of the same industrial establishment, or to another establishment, or to a protected staircase or a protected corridor, the following considerations will apply:

a) When a construction element enters on a façade **in the same industrial establishment**, the fire resistance (EI, or REI in the elements having a load-bearing function) of that façade shall be at least 50% of that required of that construction element, in a strip whose width will be such that the points on the façade that do not reach the indicated fire resistance values, must be separated at least a distance 'd' in horizontal projection, depending on the angle 'α' formed by the exterior planes of that façade, as follows:

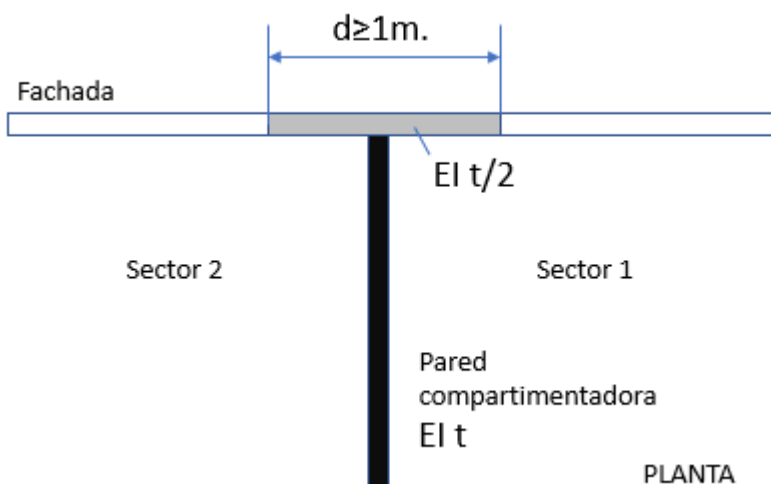
$$d = 3 - i$$

Where 'd' is the distance of separation (in m) and 'α' the angle formed by the exterior planes of the façade (between 90° and 180°).

Table 2.2.2.
VALUES OF 'd' FOR VARIOUS ANGLES 'α'.

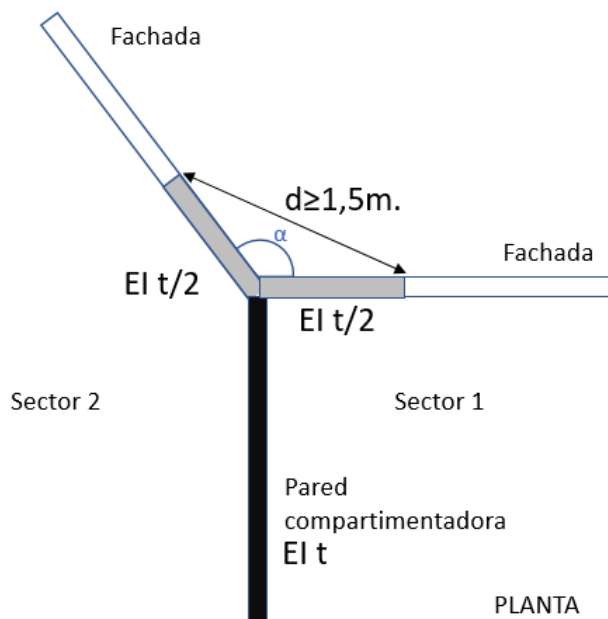
α	90° (perpendicular façades)	135°	180° (flat façade)
d (m)	2.00	1.50	1.00

Note: For façades with an angle $\alpha > 180^\circ$, the same distances as those set out for flat façades may be applied. For façades with an angle $\alpha < 90^\circ$, see conditions in letter c).



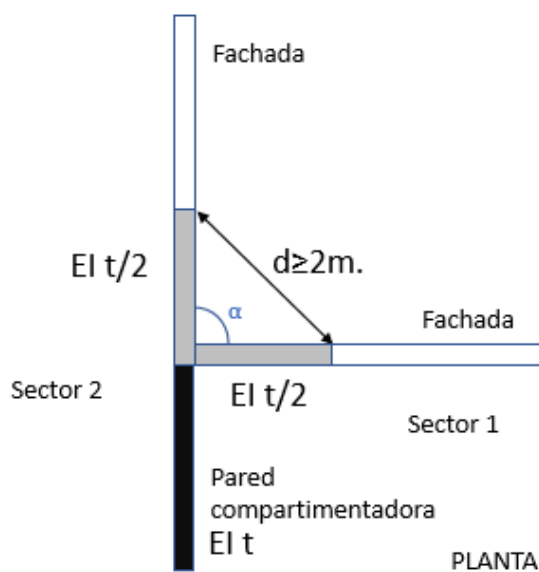
Fachada	Façade
EI t/2	EI t/2
Sector 1	Sector 1
Sector 2	Sector 2
Pared compartimentadora	Partitioning wall
EI t	EI t
PLANTA	FLOOR

Figure 2.1: Partitioning between two sectors with flat façade ($\alpha=180^\circ$).



Fachada	Façade
El t/2	El t/2
Sector 1	Sector 1
Sector 2	Sector 2
Pared compartimentadora	Partitioning wall
El t	El t
PLANTA	FLOOR

Figure 2.2: Comparison between two sectors with angle $\alpha=135^\circ$ façades.

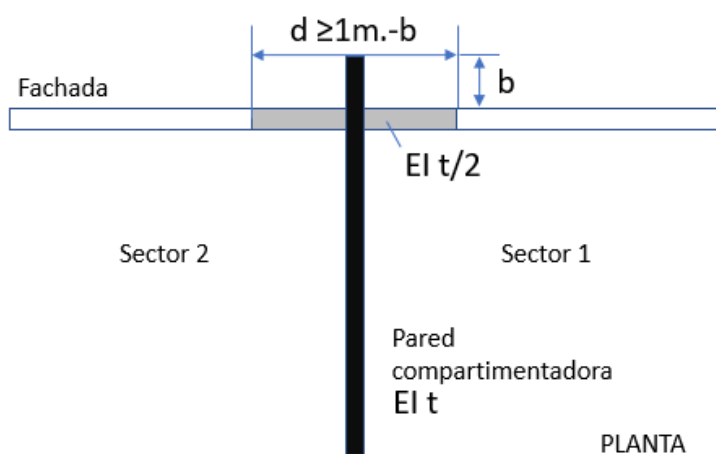


Fachada	Façade
El t/2	El t/2
Sector 1	Sector 1
Sector 2	Sector 2
Pared compartimentadora	Partitioning wall

EI t	EI t
PLANTA	FLOOR

Figure 2.3: Compartmentalisation between two sectors with perpendicular façades ($\alpha=90^\circ$).

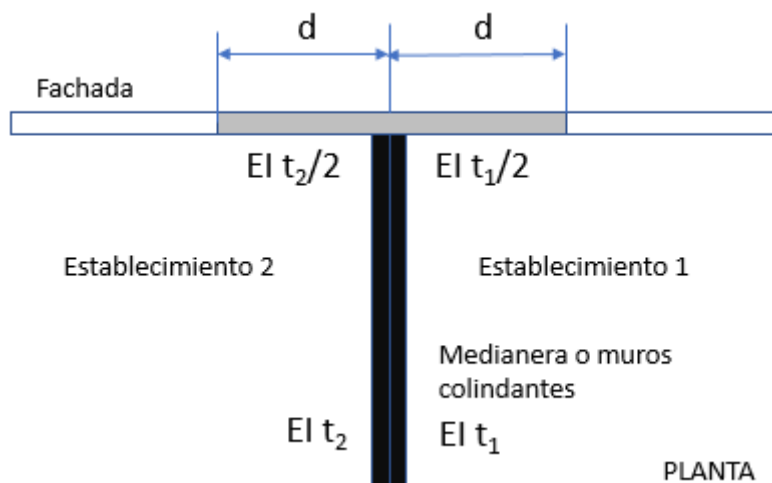
On flat façades, the distance 'd' may be reduced if there are salient vertical elements suitable to prevent the passage of flames that ensure a correct compartmentalisation. In this case, the distance 'd' may be reduced in the dimension of the said projection.



Fachada	Façade
EI t/2	EI t/2
Sector 1	Sector 1
Sector 2	Sector 2
Pared compartimentadora	Partitioning wall
EI t	EI t
PLANTA	FLOOR

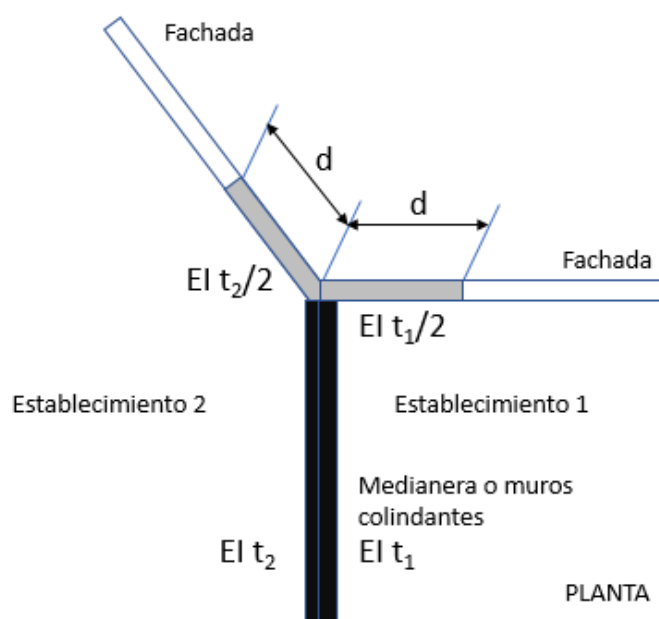
Figure 2.4: Compartmentalisation with a flat façade ($\alpha=180^\circ$) and vertical outgoing.

b) In the case of **different establishments**, the points of the façade of the establishment considered that do not reach the indicated fire resistance values, shall meet the minimum distance of 'd' in horizontal projection to the point of intersection between the two façades.



Fachada	Façade
El $t_1/2$	El $t_1/2$
El $t_2/2$	El $t_2/2$
Establecimiento 1	Establishment 1
Establecimiento 2	Establishment 2
Medianera o muros colindantes	Dividing or adjoining walls
El t_1	El t_1
El t_2	El t_2
PLANTA	FLOOR

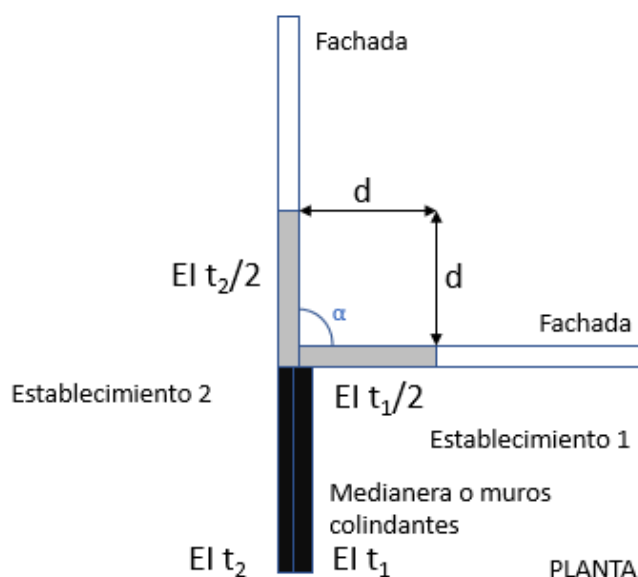
Figure 2.5: Compartmentalisation between two establishments with a smooth façade ($\alpha=180^\circ$).



Fachada	Façade
El $t_1/2$	El $t_1/2$
El $t_2/2$	El $t_2/2$
Establecimiento 1	Establishment 1
Establecimiento 2	Establishment 2
Medianera o muros colindantes	Dividing or adjoining walls

El t ₁	El t ₁
El t ₂	El t ₂
PLANTA	FLOOR

Figure 2.6: Compartmentalisation between two establishments with façades at angle $\alpha=135^\circ$.



Fachada	Façade
El t ₁ /2	El t ₁ /2
El t ₂ /2	El t ₂ /2
Establecimiento 1	Establishment 1
Establecimiento 2	Establishment 2
Medianera o muros colindantes	Dividing or adjoining walls
El t ₁	El t ₁
El t ₂	El t ₂
PLANTA	FLOOR

Figure 2.7: Compartmentalisation between two establishments with perpendicular façades ($\alpha=90^\circ$).

Alternatively, it may be accepted to reduce the distance to that indicated in point (a) above, provided that there is a binding and permanent agreement between the two establishments in order to maintain fire resistance at these distances (which must be at least EI t/2 of the sector of the establishment with greater requirements).

c) Where **façades between two different establishments forming an angle of less than 90°**, or façades facing at a distance of up to 3 m apart, those parts of the façades separated at a distance of 3 m or less shall be considered as adjoining walls and the provisions of note 4 to Table 2.2.1 shall apply.



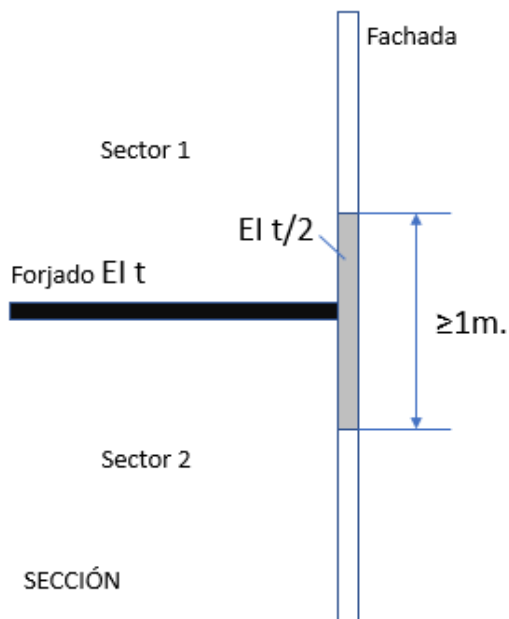
Fachada	Façade
$EI t_1$	$EI t_1$
$EI t_2$	$EI t_2$
Establecimiento 1	Establishment 1
Establecimiento 2	Establishment 2
Medianera o muros colindantes	Dividing or adjoining walls
$EI t_1$	$EI t_1$
$EI t_2$	$EI t_2$
PLANTA	FLOOR

Figure 2.8: Compartmentalisation between two establishments with façades at angle $\alpha < 90^\circ$.

In the event that these façades belong to the same industrial establishment, the provisions of section 1.2 shall apply.

1.4. In order to limit the risk of vertical external spreading of the fire through the façade between fire sectors of the same industrial establishment, or to another establishment, or to a protected staircase or a protected corridor, the following considerations shall apply:

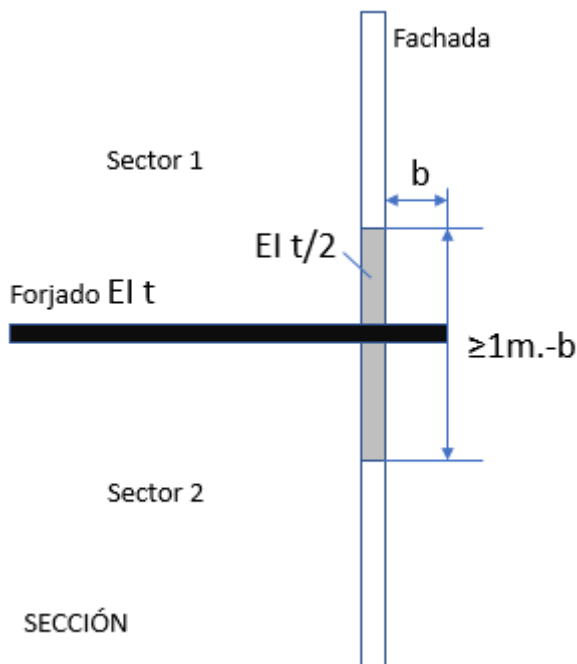
When a top slab subdividing fire sectors meets a façade, the fire resistance (EI , or REI in the elements having a bearing function) of it shall be at least 50% of that required for that construction element, in a strip whose height shall be at least 1 m, measured on the plane of the façade.



Fachada	Façade
Sector 1	Sector 1
EI t/2	EI t/2
Forjado EI t	Top slab EI t
Sector 2	Sector 2
SECCIÓN	PART

Figure 2.9: Compartmentalisation.

In case of outgoing elements suitable to prevent the passage of flames, the height of that strip may be reduced by the dimension of the said projection.



Fachada	Façade
Sector 1	Sector 1
EI t/2	EI t/2
Forjado EI t	Top slab EI t
Sector 2	Sector 2
SECCIÓN	PART

Figure 2.10: Compartmentalisation with horizontal projection on the façade.

1.5. The fire reaction class of façade building systems occupying more than 10% of their surface area shall be at least and depending on the overall height of the façade:

- a) D-s3,d0 on façades up to 10 m high;
- b) C-s3,d0 on façades up to 18 m high;
- c) B-s3,d0 on façades of height greater than 18 m.

This classification must be considered as the final used condition of the construction system, including all materials that make up layers contained in the interior of the façade solution and which are not protected by a layer that is at least EI30.

1.6. Insulation systems situated inside ventilated chambers must have at least the following fire reaction class, based on the total height of the façade:

- a) D-s3,d0 on façades up to 10 m high;
- b) B-s3,d0 on façades up to 28 m high;

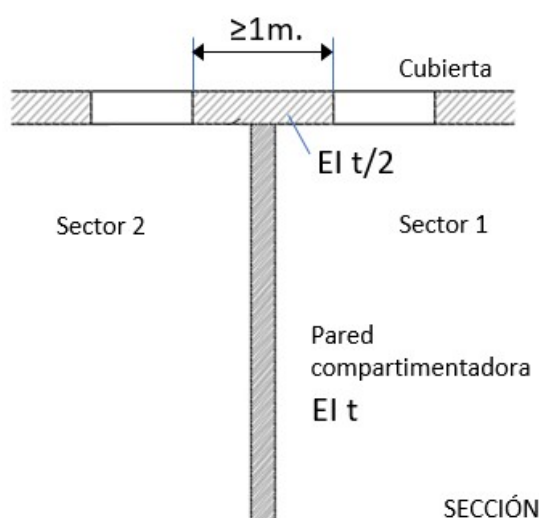
c) A2-s3,d0 on façades with a height of more than 28 m.

The vertical development of ventilated façade chambers in continuity with fire resistant slabs that separate fire sectors must be limited. The inclusion of E 30 barriers can be considered a valid procedure to limit such vertical development.

1.7. For façades 18 m high or less whose lower level is accessible to the public from the exterior grade or from a roof, the fire reaction class of the construction systems mentioned in section 1.4 and of those situated inside the ventilated chambers, where applicable, must be at least B-s3,d0 up to a height of at least 3.5 m.

2. Roofs of buildings

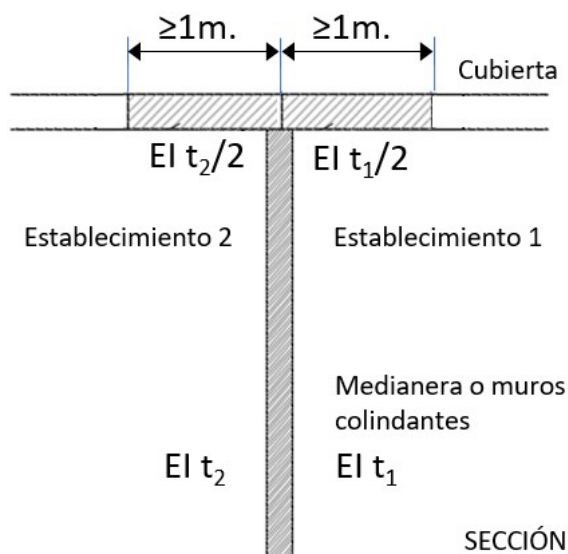
2.1. In order to limit the risk of external propagation of the fire on the deck, where a constructive element of compartmentalisation of fire sectors of an establishment commits to the deck, the fire resistance (EI, or REI in the elements having a load-bearing function) of the fire shall be at least half that required of that construction element, in a strip whose width is equal to 1 metre divided between the two sectors.



Cubierta	Cover
EI t/2	EI t/2
Sector 1	Sector 1
Sector 2	Sector 2
Pared compartimentadora	Partitioning wall
EI t	EI t
SECCIÓN	PART

Figure 2.11: Compartmentalisation on covering.

2.2. Where a dividing wall or adjoining walls between two different establishments meet the cover, the fire resistance (EI, or REI in the elements having a bearing function) of the roof shall be at least half that required of those building elements, in a strip whose width is equal to 1 metre in each of the establishments.

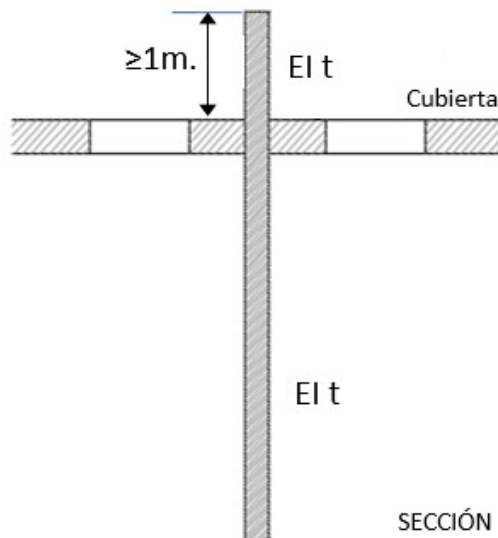


Cubierta	Cover
EI t ₁ /2	EI t ₁ /2
EI t ₂ /2	EI t ₂ /2
Establecimiento 1	Establishment 1
Establecimiento 2	Establishment 2
Medianera o muros colindantes	Dividing or adjoining walls
EI t ₁	EI t ₁
EI t ₂	EI t ₂
SECCIÓN	PART

Figure 2.12: Compartmentalisation between two establishments.

Alternatively, it may be accepted to reduce the distance to the one indicated in section 2.1 above, provided that there is a binding and permanent agreement between the two establishments to maintain fire resistance at these distances (which must be at least EI t₂/2 of the sector of the establishment with higher requirements).

2.3. As an alternative to the above conditions, you can choose to extend the dividing wall or the compartmentalising element by one metre above the finish of the cover.



Cubierta	Cover
Ei t	Ei t
SECCIÓN	PART

Figure 2.13: Compartmentalisation on covers by means of vertical compartmentalising element.

2.4. Where the above options are not possible (in the case of renovations of existing buildings), the compartmentalisation may consist of a horizontal barrier one metre wide, located below the deck, fixed to the dividing wall and at least half of the fire resistance required of that building element. In such a case, the barrier shall in no case be installed at a distance greater than 40 cm from the bottom of the deck and its permanence should be ensured in case of collapse of parts of the cover not resistant to fire. Above this strip there can be no construction elements or materials capable of transmitting the fire.

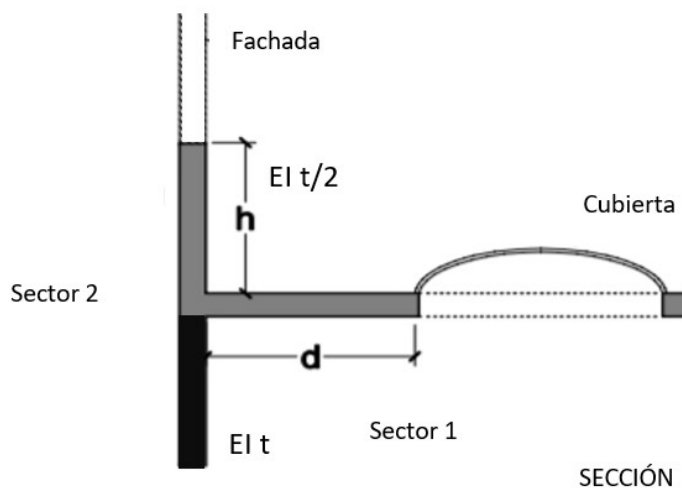


Figure 2.14: Compartmentalisation on deck by means of barrier under the cover.

2.5. In the encounter between a roof and a façade belonging to fire sectors or to different establishments, the height 'h' on the roof to which any area of the façade whose fire resistance is not at least 50% of the IS of the construction element must be that indicated below, depending on the distance 'd' of the façade, in horizontal projection, to which is any area of the roof whose resistance to fire does not reach that value either.

Table 2.2.3.
VALUES OF THE HEIGHT 'h' BASED ON DISTANCE 'd'.

d (m)	≥2,50	2.00	1.75	1.50	1.25	1.00	0.75	0.50	0
h (m)	0	1.00	1.50	2.00	2.50	3.00	3.50	4.00	5.00

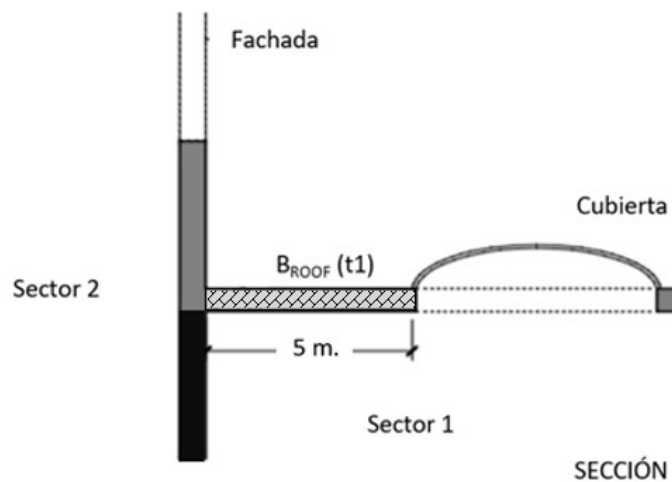


Fachada	Façade
Cubierta	Cover
EI t/2	EI t/2
Sector 1	Sector 1
Sector 2	Sector 2
EI t	EI t
SECCIÓN	PART

Figure 2.15: Meting point of the cover and façade.

2.6. In the meeting point between a roof and a façade belonging to fire sectors or to different establishments, where that façade has areas whose fire resistance is less than 50% of the IS of the construction element, materials that occupy more than 10% of the outer coating or finish of the cover areas located less than 5 m away from the vertical projection of any façade area above said roof, must belong to the class of reaction to fire $B_{ROOF} (t1)$, including possible skylights, skylights and any other element of lighting or ventilation.

This requirement will not apply where the roof and façade are part of different buildings, more than 3 m apart.



Fachada	Façade
Cubierta	Cover
Sector 1	Sector 1
Sector 2	Sector 2
SECCIÓN	PART

Figure 2.16: Fire reaction of the deck, in the cover-façade meeting point.

3. External spreading in industrial establishments located in open spaces

3.1. Fire areas located in open spaces of type D configuration (except those with low risk level 1) shall:

- a) Be separated from adjacent establishments by a distance between the stored combustible materials and the limit of the establishment as set out in Part 1, section 1.5.a, unless the applicable urban planning rules ensure such distance between the fire area and the boundary; or
- b) be separated from adjacent establishments by compartmentalising elements ensuring a minimum fire resistance of EI 120, 180 or 240 for low, medium or high risk areas respectively, with the same considerations as in Section 1.5(b) of Part 1.

3.2. In the case that they have some covered areas or areas with lateral enclosures assimilable to façades, the requirements of sections 1 and 2 above applicable to them shall be met.

Part 3. Evacuation of occupants

1. Compatibility of evacuation elements

1.1. Where industrial and non-industrial establishments coexist in a building of type A_v or A_H, the evacuation through the common areas of the building shall satisfy the conditions laid down in the CTE



DB-SI, while the evacuation within the industrial establishments shall satisfy the conditions set out in section 3 of this Part.

The evacuation of the industrial establishment may be carried out by the common areas of the building provided that access to them is made through a fire lobby.

If the number of occupants of the industrial establishment (P , calculated according to section (2)) is greater than 50 persons, it must have an exit independent of the rest of the building.

1.2. For industrial establishments in buildings with areas of non-industrial use under the same ownership that must constitute independent fire sectors in accordance with Article 4 of the Regulation, 'Regulatory compatibility', the evacuation of such sectors of non-industrial use shall satisfy the conditions laid down in the CTE DB-SI.

1.3. The evacuation of industrial establishments located in buildings of type A_V or A_H where all establishments are for industrial use, or where industrial and non-industrial establishments coexist that do not share evacuation routes through common areas, as well as in buildings of type B or C, shall satisfy the conditions set out in section 3.

1.4. The evacuation of industrial establishments located in open spaces (type D configuration) shall satisfy the conditions set out in section 4.

2. Calculation of occupation

For the application of the requirements relating to the evacuation of industrial establishments, their occupation, ' P ', shall be determined for each of their sectors, deduced from the following expressions:

- a) $P = 1.10 p$, when $p < 100$.
- b) $P = 110 + 1.05 (p - 100)$, when $100 < p < 200$.
- c) $P = 215 + 1.03 (p - 200)$, when $200 < p < 500$.
- d) $P = 524 + 1.01 (p - 500)$, when $500 < p$.

Where ' p ' represents the number of people who occupy the fire area, according to the labour documentation that regulates the operation of the activity.

The values obtained for ' P ', according to the above expressions, shall be rounded to the immediately superior integer.

3. Evacuation of industrial establishments located in buildings

3.1. Number of exits and length of evacuation routes

3.1.1. Number of exits: It shall be based on section 3 of Part SI 3 of the CTE DB-SI, on the basis of the occupancy calculated in accordance with this Regulation and adding the following considerations:

- a) At least two alternative exits shall be available to the high intrinsic fire sectors with a constructed surface area exceeding 50 m².
- b) Medium or low Intrinsic risk fire sectors with a built surface area greater than 50 m² shall have at least two alternative exits, where their number of occupants (P) exceeds 50 persons, or when intended to be used for the evacuation of more than 50 persons (including possible occupants from other areas of the establishment who must use the passage through that sector to reach the exit).

3.1.2. The length of the escape routes of the fire sectors to the exit from the floor or building shall not exceed the values indicated in the following table and shall prevail over those set out in Table 3.1 of Part SI 3 of CTE DB-SI:

Table 2.3.1.
ESCAPE ROUTE LENGTH ACCORDING TO THE NUMBER OF EXITS AND THE LEVEL OF
INTRINSIC RISK OF THE FIRE SECTOR

Intrinsic risk level	One exit	Two or more alternative exits	
	Distance to exit ⁽¹⁾ _{(3) (4)}	Travel distance without alternative _{(2) (4)}	Distance to nearest exit ⁽¹⁾ ₍₄₎
Low risk ⁽⁵⁾	50 m	50 m	65 m
Medium risk	35 m	35 m	50 m
High risk	20 m	20 m	35 m

Table Notes:

Note 1: It refers to the total distance from any origin of evacuation to the floor exit or building exit.

Note 2: It refers to the length of evacuation routes from their origin to some point from which there are at least two alternative routes.

Note 3: Where a sector has only one exit and its evacuation route passes through other intermediate sectors to the exit of the floor or building, the maximum length of that route shall be that applicable to the sector with a higher level of risk.

Note 4: The lengths of the escape routes included in Table 2.3.1 may be increased using the coefficients indicated according to the following conditions. (The coefficients are not cumulative, so only one of them can be applied):

- a) In fire sectors protected by a fixed automatic water-based extinguishing system, or other types of fixed automatic firefighting systems that are compatible to operate during the evacuation phase, routes may be increased by 25%.
- b) In fire sectors equipped with a smoke and heat control system in accordance with section 8.3 of Annex III, designed with the objectives of protecting the means of evacuation and facilitating fire-fighting operations, the routes may be increased by 25 %.



- c) In sectors located on the exit floor of the building, with two or more direct exits to the outside, with a ceiling height equal to or greater than 8 m and protected by a fixed automatic extinguishing system compatible to be able to operate during the evacuation phase: The routes may be increased by up to 100 % compared to the values indicated in the table, without being able to exceed a maximum of 90 m. Where the sector has several floors or sub-floors, only the above may be applied to evacuation from evacuation origins located on the exit floor of the building.

Note 5: For sectors classified as low risk level 1 where it is justified that existing materials (including both stored content, construction products and coatings) are non-combustible or very low combustibility and smoke emission (class A1 or A2, or equivalent behaviour) by 95 % mass, the maximum distance of evacuation routes to 100 m may be increased in the case of an exit; or, up to 150 m to the nearest exit in cases of two or more exits and with a route distance without an alternative of maximum 100 m. (When applying this note, the coefficients in note 4 cannot be applied).

3.1.3. Other considerations:

- a) The exit of the floor from one sector to another alternative fire area will not require a fire lobby provided that the sector of origin has an occupation (P) of up to 25 people (if applicable, including also those occupants from other areas that must use the passage through that sector to reach the exit), or, when the free height of the floor in both sectors is equal to or greater than 5 m.
- b) In areas of sectors whose activity prevents the presence of personnel (e.g. in warehouses operated automatically), evacuation requirements shall apply only to areas where there may habitually be people. This particularity must be justified.
- c) The requirements of this section do not apply to the conditions of evacuation of areas for exclusive use by personnel specialised in maintenance, repairs, controls, etc., whose access and evacuation are particular, such as a lift shaft, a catwalk, a deck for restricted use, etc., or to items intended for such personnel, such as ladders or accesses. The regulation of the conditions of evacuation of these areas and elements corresponds to the regulations on safety at work or to the specific regulations of the installations and equipment concerned.

3.2. Dimensions of evacuation means

The dimensions of the means of evacuation shall be made in accordance with section 4 of Part SI 3 of the CTE DB-SI, adding the following consideration:

- a) The width of the corridors must not be less than 1 metre. The width of doors and steps must be at least 80 cm.

3.3. Protection of stairs and corridors

3.3.1. Ladders intended for descending evacuation shall be protected when they exceed the evacuation height of 14 m.



The stairs for upward evacuation shall be protected when saving evacuation heights greater than 1.50 m and are intended for more than 25 persons, except in the case of evacuation heights greater than 2.8 m.

3.3.2. Protected corridors shall comply with the definitions of CTE DB-SI, with the following additional considerations:

- a) Ventilation for smoke protection of protected aisles, where provided by differential pressure systems, shall include air drive points at least every 10 m of aisle length.
- b) Exceptionally, protected corridors whose accesses are always from upper floors may have a number of accesses greater than two.

3.4. Doors located on evacuation routes

The doors located on evacuation routes shall be in accordance with section 6 of Part SI 3 of the CTE DB-SI for cases where they are located or are envisaged for the number of persons indicated there, with the following considerations:

- a) Such conditions shall not apply to the doors of refrigeration rooms.
- b) In any case, all doors located on evacuation routes must be easily operable manually.

3.5. Signalling of means of evacuation

3.5.1. The signalling of exits and evacuation directions shall comply with section 7 of Part SI 3 of the CTE DB-SI.

3.5.2. The safety signage must comply with Royal Decree 485/1997 of 14 April establishing the minimum requirements for safety and health signs at work.

4. Evacuation of industrial establishments located in open spaces

4.1. The provisions on evacuation and signalling in industrial establishments located in type D configurations shall be in accordance with the provisions of Royal Decree 485/1997 of 14 April on minimum requirements for safety and health signs at work and Royal Decree 486/1997 of 14 April laying down minimum safety and health requirements at workplaces.

4.2. The 5-metre wide separations referred to in Part 1, sections 1.5 and 1.6, must be capable of serving as emergency evacuation paths.

In addition, in Type D configurations that have covered areas, such areas shall also comply with the evacuation requirements required of buildings in section 3 of this Part which apply to them, with lengths equivalent to those of the evacuation routes in Table 2.3.1 being applied from any indoor covered point (origin of evacuation) to the exit point of the covered area.



Part 4. Intervention of fire-fighters

Both urban planning and the conditions of design and construction of the industrial establishments, in particular the immediate environment, their accesses, their façade gaps, etc. must enable and facilitate the intervention of the Firefighting and Rescue Services (hereinafter, SEIS), in accordance with the provisions of this section.

Given the scope of this regulation, the elements of the establishment environment for which this regulation is mandatory are only those that are part of the industrial establishment project, including the elements of urbanisation that remain attached to it. As regards that part of the environment of establishments where this regulation is not mandatory, local authorities may regulate the conditions they deem necessary to comply with the above. For such cases and in the absence of regulatory regulation by local authorities, the following can be adopted as recommendations.

1. Approach and environment conditions

1.1. Approach and environment of buildings where industrial establishments and establishments coexist with other uses.

1.1.1. When industrial and non-industrial establishments coexist in a building of type A_v or A_H , the approach and environment conditions must meet the requirements of CTE DB-SI, Part 5, section 1, 'Environment and environment conditions'.

1.1.2. When in a building of type A_v or A_H industrial and non-industrial establishments coexist, with most of the building being for industrial use, as well as in buildings of type B or C, the conditions of approach and environment must meet the requirements of sections 1.2 and 1.3 below.

1.2. Approaching buildings for industrial use.

1.2.1. The **ways for SEIS vehicles to approach** the handling spaces as referred to in section 1.3.1, must meet the following conditions:

- a) Minimum free width in straight sections: 5 m.
- b) Minimum free height or gauge: 4.5 m.
- c) Bearing capacity of the road: 20 kN/m².

1.2.2. In curved sections the running rail must be delimited by the trace of a circular crown whose minimum radii must be 5.3 m and 12.5 m, with a free width for circulation of 7.2 m.

1.3. Environment of buildings for industrial use.

1.3.1. Buildings with a floor area above 1 000 m² or with a descending evacuation height greater than 9 m, must have a **manoeuvre space** suitable for the passage and placement of SEIS vehicles that meets the following conditions along the façades on which the accesses are located:

- a) Free minimum width: 6 m.
- b) Free height: the height of the building.
- c) Maximum separation of the SEIS vehicle to the façade of the building: 15 m.
- d) Maximum distance to the accesses to the building necessary for reaching all its areas: 30 m.
- e) Maximum slope: 10%.
- f) Resistance to shear reinforcement: 100 kN over 20 cm Ø.

1.3.2. The condition relating to the shear effect must be met on the registration covers of utility pipelines located in that space when their dimensions are greater than 0.15 m x 0.15 m, and must comply with the specifications of the UNE-EN 124 series of standards.

1.3.3. The manoeuvring space should be kept free of street furniture, trees, gardens, poles or other obstacles. Similarly, where access to a façade with stairs or hydraulic platform is provided, elements such as aerial electrical cables or tree branches that may interfere with stairs, etc.

1.3.4. If the building is equipped with a dry riser, there must be access for a self-pumped firefighting vehicle less than 18 m from each connection point to it. The connection point shall be visible from that vehicle.

1.3.5. A sufficient space for manoeuvring a SEIS vehicle to allow the change of direction of the vehicle shall be provided on a non-exit access track of more than 20 m long. This manoeuvring space may consist of a circular area of radius equal to or greater than 9 m, or other similar solutions.

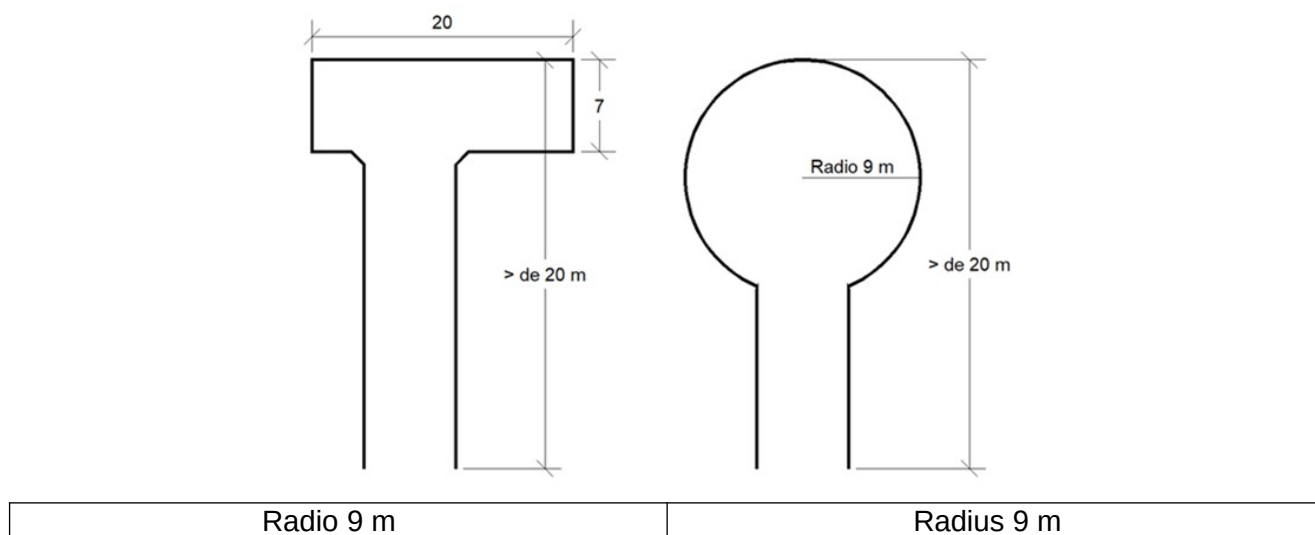


Figure 2.17: Examples of different forms of manoeuvring spaces on access roads without exits.

1.3.6. The provisions of Royal Decree 893/2013 of 15 November approving the basic planning guideline for civil emergency protection due to forest fires, as well as territorial plans developed in the application of the same and the other specific legislation that may exist, will be complied with in areas built bordering or interior to forest areas.

2. Accessibility to the façade and interior

2.1. The façades referred to in section 1.3.1 must have the condition of **accessible front** and must allow SEIS staff both access to and access through the interior of the building.

For this purpose, in order for a façade to be considered accessible, it must have gaps that allow access from the outside to SEIS staff. These gaps must comply with the following conditions:

- Facilitate access to each of the floors of the building, so that the height of the sill with respect to the level of the floor to which it provides access is not greater than 1.20 m.
- Its horizontal and vertical dimensions must be at least 0.80 m and 1.20 m respectively. The maximum distance between the vertical axes of two consecutive gaps must not exceed 25 m, measured on the façade.
- On the exit floor of the building (ground floor), at least one of the aforementioned accesses must allow pedestrian access at ground level and having a vertical dimension of at least 2 m.
- No elements that prevent or hinder accessibility to the interior of the building through these gaps should be installed on the façade, except for the safety features located in the gaps of floors whose evacuation height does not exceed 9 m.

2.2. The **location and the dimensions** accessible façades should be designed with the aim of enabling an agile and safe intervention of SEIS staff in the entire building.

The length of the accessible façade should not be less than 15 % of the perimeter of the building floor. In the case of rectangular buildings, when this condition of 15 % is not met with the length of the façade of one of its sides, another additional accessible façade area with its corresponding manoeuvring space, preferably on the opposite side of the first, should be available until it reaches the indicated percentage. In other cases, similar solutions must be available depending on the shape of the building, designed according to the objective of enabling intervention in the whole of the building.

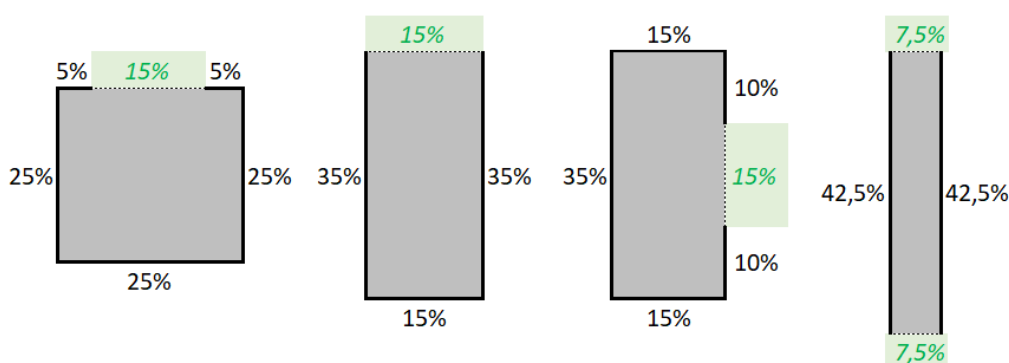


Figure 2.18: Examples of location and minimum dimensions (in %) of accessible façades in square and rectangular buildings



In the case of small buildings (less than 500 m² of floor area) or with low fire load density (low risk sectors), the characteristics of these and the specific intervention needs in fire situations should be assessed, and the percentage of accessible façade length may be reduced where appropriate. This particularity must be justified.

In the case of particularly large buildings (over 10 000 m² of floor area), or buildings with complex designs (due to their shape, layout, etc.), or with large areas with very high fire load density (such as high risk level 8 sectors of a surface area greater than 2 000 m²), the characteristics of these and the specific needs for intervention in fire situations should be assessed, and if necessary, the number of accesses or the percentage of accessible façade length increased or other additional measures taken in order to achieve the above-mentioned objective.

2.3. In cases where the manoeuvring space referred to in section 1.3.1 is not mandatory, the accessible façade shall be located on the access roads that exist in each case, with characteristics similar to those indicated in sections 2.1 and 2.2. In this case, there should be no more than 50 m from the access roads to the pedestrian accesses to the building, with a minimum passage width of 1.80 m.

2.4. In the case of buildings with several establishments (type A_V or A_H) the requirements of the accessible façade indicated in sections 2.1 and 2.2 should apply to each establishment separately, taking into account the accesses, the façade areas and the characteristics of the establishment concerned, and may also consider the common façade areas of the building as part of the accessible façade of the establishment concerned, provided that it allows access to it directly or through common elements of the building.

2.5. In the case of industries where, due to their specific activity, it is not possible to have accessible façades that fully or partially comply with the conditions of sections 2.1 and 2.2, similar solutions must be applied that achieve the same objectives, such as the existence of compartmentalised routes with EI 120 elements and EI₂ 60-C5 doors that provide access to SEIS personnel and that have smoke protection through some of the options set out in the DB-SI CTE for the protection of stairs and corridors, or smoke and heat control system.

2.6. In the case of open space fire areas (type D configuration), the characteristics and distribution of these areas and their accesses should be designed with the aim of allowing an agile and safe intervention of SEIS staff throughout all of them. In addition, the 5-m wide separations referred to in Part 1, sections 1.5 and 1.6, should be capable of serving as emergency access and intervention routes for SEIS staff.

Part 5. Structural resistance to fire

1. Fire resistance of bearing construction elements

1.1. The fire resistance of main structural elements with a bearing function of buildings shall not be less than that indicated in the following table:



Table 2.5.1.
MINIMUM FIRE RESISTANCE OF MAIN STRUCTURAL ELEMENTS WITH BEARING FUNCTION

Intrinsic risk level	Type A _v		Type A _h		Type B		Type C	
	Floor below ground (basement)	Floor above ground	Floor below ground (basement)	Floor above ground	Floor below ground (basement)	Floor above ground	Floor below ground (basement)	Floor above ground
Low risk	R 120	R 90	R 120	R 90	R 90	R 60	R 60	R 30
Medium risk	NOT ADMITTED	R 120	R 180	R 120	R 120	R 90	R 90	R 60
High risk	NOT ADMITTED	NOT ADMITTED	NOT ADMITTED	R 180	R 180	R 120	R 120	R 90

Table Notes:

Note 1: R = Load-bearing capacity (expressed in minutes).

Note 2: This table does not apply to secondary elements, which would not require protection. For these purposes, secondary elements are understood to be those whose collapse due to the direct action of the fire cannot cause damage to the occupants, or compromise the overall stability of the structure, evacuation or compartmentalisation of the fire sectors of the building.

With regard to the fire resistance of the stairs, where the steps of a staircase requiring fire resistance are separate elements to those bearing the ladder, such resistance is only required of the latter elements, not the steps.

Note 3: In the case of structural elements of a protected staircase or a protected corridor contained in their enclosure, they shall be at least R 30. In the case of specially protected stairs, no fire resistance to structural elements is required.

1.2. For industrial establishments in buildings with areas of non-industrial use under the same ownership that must constitute independent fire sectors in accordance with Article 4, 'Regulatory compatibility', the fire resistance required for the load-bearing structure of these fire sectors will be determined in accordance with the applicable regulations.

1.3. Particular cases for the application of section 1.1.

1.3.1. For the main structure of the light roofs not intended to be used in the evacuation of the occupants, as long as the evacuation of the establishment is guaranteed and it is justified that their failure cannot cause serious damage to nearby buildings or establishments and that the stability of other lower floors or the implanted fire partitioning is not compromised and, if the intrinsic risk of the sector is medium or high, as long as it has a smoke and heat control system in accordance with section 8.3 of Annex III, the following values can be adopted:



Table 2.5.2.

Risk level intrinsic	Type B	Type C
Low risk	R 15	No justification for resistance is required
Medium risk	R 30	R 15
High risk	R 60	R 30

Note: This table applies only to the main structure of the light roofs, without considering the pillars or any other support of the same. For this purpose, the table will be applied to lintels, trusses or equivalent elements. On the contrary, this table does not apply to secondary elements of the cover, which would not require protection, such as cover straps that have no main load-bearing function.

1.3.2. In buildings on a single floor and with a light roof, where the total area of the fire area is protected by a fixed automatic extinguishing system and a smoke and heat control system in accordance with section 8.3 of Annex III, the fire resistance of the bearing structures may take the following values:

Table 2.5.3.

Intrinsic risk level	Type A _H	Type B	Type C
Low risk	R 60	R 30	R 30
Medium risk	R 90	R 30	R 30
High risk	R 120	R 30	R 30

Note: In order to apply this table in A_H buildings, the deck structure considered must be independent from the other establishments.

1.3.3. In buildings of single-storey industrial establishments constituting a single fire area, or with administrative areas on more than one floor but compartmentalised from industrial use according to their specific regulations and with an independent structure, located in buildings of type C separated by at least 10 m from other establishments as well as plot limits with the possibility of building in them and free of combustible goods or intermediate elements capable of spreading fire, and protected by a fixed automatic extinguishing system and a system for the control of smoke and heat according to section 8.3 of Annex III, it is not necessary to justify the fire resistance of the structure.

In the case of two adjoining establishments, these 10 m can be divided between them provided that there is a binding and permanent agreement between them in order to keep that space free of buildings and combustible goods. On the other hand, in the 10 m there may be vegetation, parked vehicles and other specific elements provided that the approach roads and the manoeuvring spaces referred to in section 4 are not damaged. In addition, to determine the mentioned distance of 10 m, the space of the public road can also be counted.

1.3.4. When, according to Table 2.5.2 or 1.3.3, it is permissible not to justify fire resistance, this particularity must be marked at the entrances of the building so that the personnel of the Firefighting and Rescue Services are aware of this.



1.4. In fire areas located in open spaces (type D configuration), in the case of structures, these must be independent of the adjacent buildings, or have sufficient fire resistance so that, in both cases, potential collapses that may drag or affect the structure of the buildings or adjacent establishments are avoided.



ANNEX III EQUIPMENT REQUIREMENTS FOR ACTIVE FIRE PROTECTION INSTALLATIONS IN INDUSTRIAL ESTABLISHMENTS

This Annex sets out the requirements for the provision of active fire protection facilities (equipment, systems and components) for industrial establishments.

The necessary facilities in each establishment shall depend on the characterisation carried out in advance in accordance with Annex I. The design, installation, entry into service and maintenance of such facilities must also comply with the Fire Protection Facilities Regulation (RIPCI) and any other specific regulations applicable to them.

I. TERMS AND DEFINITIONS

The following definitions are established:

- a) Fixed automatic firefighting systems: Fixed automatic firefighting systems (or automatic firefighting systems) are firefighting systems whose discharge of the agent starts by itself, without human intervention. These include the following systems defined in Annex I to the RIPCI:
- i. Fixed firefighting systems using automatic sprinklers and water spray,
 - ii. fixed firefighting systems using mist water,
 - iii. fixed foam firefighting systems,
 - iv. fixed firefighting systems using powder,
 - v. fixed firefighting systems using gaseous extinguishing agents,
 - vi. fixed condensed aerosol firefighting systems,
 - vii. as well as other fixed automatic firefighting systems that may appear in the future, and that comply with the provisions of the RIPCI.

Note: Since each of these systems may have their specific characteristics and uses, when choosing a certain automatic fixed extinguishing system, this should be considered appropriate for the place and risk to be protected.

1. Fire-detection and alarm systems

1.1. Fire-detection and alarm systems shall consist of devices for automatic activation (detectors) or devices for manual activation (manual alarm buttons), connected to control and indication equipment and alarm devices.



1.2. Detection and alarm systems shall be installed with devices for both automatic activation and manual activation (detectors and manual pushers) in the fire sectors of industrial establishments when the following is carried out in them:

1º. Manufacturing activities and other similar processes, such as production, processing, repair or others other than storage, in the following cases:

- a) In configurations of type A_v or A_H: Sectors with built surface area of 300 m² or higher.
- b) In Type-B configurations:
 - i. Sectors with low intrinsic risk level (except those with low risk level 1) and built surface area of 3 000 m² or higher.
 - ii. Sectors with average intrinsic risk level and built surface area of 2 000 m² or greater.
 - iii. Sectors with high intrinsic risk level and built surface area of 1 000 m² or greater.
- c) In Type-C configurations:
 - i. Sectors with low intrinsic risk level (except those with low risk level 1) and built surface area of 4 000 m² or higher.
 - ii. Sectors with average intrinsic risk level and built surface area of 3 000 m² or greater.
 - iii. Sectors with high intrinsic risk level and built surface area of 2 000 m² or greater.

2º. Storage activities, in the following cases:

- a) In configurations of type A_v or A_H: Sectors with built surface area of 150 m² or higher.
- b) In Type-B configurations:
 - i. Sectors with low intrinsic risk level (except those with low risk level 1) and built surface area of 1 500 m² or higher.
 - ii. Sectors with average intrinsic risk level and built surface area of 1 000 m² or greater.
 - iii. Sectors with high intrinsic risk level and built surface area of 500 m² or greater.
- c) In Type-C configurations:
 - i. Sectors with low intrinsic risk level (except those with low risk level 1) and built surface area of 3 000 m² or higher.
 - ii. Sectors with average intrinsic risk level and built surface area of 1 500 m² or greater.
 - iii. Sectors with high intrinsic risk level and built surface area of 800 m² or greater.

Note: Where there are both manufacturing and permanent storage activities in a sector (without considering as such the 'day store'), the installation of these systems shall be necessary where the sum of the ratios between the area intended for manufacture and that intended for storage, between the area from which the installation is mandatory in each case, is equal to or greater than 1, as follows:

$$\left[\left(\frac{\text{Surface}_{\text{manufacture}}}{\text{Surface}_{\text{on the basis of what is mandatory for manufacturing}}} \right) + \left(\frac{\text{Surface}_{\text{storage}}}{\text{Surface}_{\text{on the basis of what is mandatory for storage}}} \right) \right] \geq 1$$
, and must be the sum of both areas equal to the area of the sector.

1.3. Where the aforementioned systems are not required in accordance with section 1.2, detection and alarm systems with at least devices for manual activation (manual buttons) shall be installed in fire sectors having a constructed surface area of 400 m² or greater.



1.4. In all cases, the systems referred to in sections 1.2 and 1.3 must have their corresponding alarm devices.

1.5. In addition, in cases where the following two situations are met simultaneously: the sum of the constructed surface of all fire sectors of an industrial establishment building is 10 000 m² or greater, and in addition, the occupancy density of the building is greater than 3 persons per 100 m²; alarm-communication systems shall be installed to allow the transmission of local alarms, general alarm and verbal instructions by means of a voice alarm system in that building of the industrial establishment, as well as in the buildings or open spaces adjacent to the same establishment if the evacuation of them is expected to be carried out in conjunction with the building concerned.

2. Water supply systems for firefighting purposes

2.1. A water supply systems for firefighting purposes shall be installed in the following cases:

a) Where necessary to provide service, under calculated flow, pressure and reserve conditions, to one or more fire protection systems, such as: equipped fire hydrant (BIE) systems, automatic sprinklers, water spray, foam, etc.

b) Or, if required by the existing provisions governing sectoral or specific industrial activities.

2.2. Water supply systems for firefighting purposes shall comply with the characteristics set out in Annex I to the RIPCI, together with the specific considerations set out in this regulation.

2.3. When several fire protection systems coexist in an industrial establishment, the flow rate (Q), pressure (P) and water reserve (R) shall be sized according to the following criteria:

a) The flow, pressure and reserve of water must be sufficient for all protection systems to operate simultaneously in the event of a localised fire. This implies that, in the event that co-existing protection systems will need to operate at the same time to act on a fire in a single location, the supply system must be calculated so that such systems can operate simultaneously.

For example, if in the same sector there are sprinklers and BIEs to protect that place, the supply system (flow, pressure and water reserve) must be calculated so that both operate simultaneously.

As particular cases, the following dimensions will be accepted in the following simultaneous situations:

- i. In cases of simultaneous use of BIE and sprinklers, or BIE and hydrants, or BIE and any other system using the water supply, only the least favourable BIE (instead of the two least favourable ones set out in the general rule) shall be considered for the calculation of the supply.
- ii. In cases of simultaneous use of hydrants together with sprinklers (or water spray or foam), as well as in the case of hydrants together with sprinklers (or water spray or foam) and together with BIE, the dimensions of the supply shall be sufficient if it meets at least the following requirements:



- Supply flow: It shall be the sum of the flow required for sprinklers (or water spray or foam), plus 50 percent of that required for hydrants. ($Q_{total} = Q_{sprinklers} + 0.5 Q_{hydrants}$).
- Supply water reserve: It will be the sum of the reserve required for sprinklers (or water spray or foam), plus 50 percent of that required for hydrants. ($R_{total} = R_{sprinklers} + 0.5 R_{hydrants}$).

b) For the calculation of the flow, pressure and water reserve it is not mandatory to provide for the overlap of more than one fire source in the establishment, since the protection systems are designed to control and extinguish a fire in a single location and see that it does not expand to other areas.

For example, if one sector is protected with sprinklers and another with water spray, the supply system can be calculated in such a way that it provides for the operation of these separately and not simultaneously, since in the case of a single fire source only one of them will be activated (the one located where the fire is).

- c) When there are several areas to be protected with several protection systems in each, it is generally sufficient to calculate the flow, pressure and reserve to satisfy the systems of the area with the most demanding demand, understanding that, in this way, this calculation will be sufficient to operate the protection systems of each of the areas to be protected, against a fire in those areas.
- d) The flow rates and water reserves calculated according to these criteria shall be considered as minimum values. However, flows and reserves may voluntarily have larger dimensions than those determined here if desired, in order to increase the level of security of the establishment or to deal with specific situations that are more demanding than those indicated here.
- e) Where several industrial establishments share the same supply system for their fire protection systems, it must comply with the provisions of the previous paragraphs and also be designed for the case of higher demand, so that it is possible to consider alternative and exclusionary fire scenarios. In addition, its proper maintenance and accessibility must be guaranteed at all times by the owners of the different establishments that share it.

3. Fire-hydrant systems

3.1. External fire hydrants will be installed if the circumstances set out in the following sections arise, or where appropriate, if required by the current provisions governing sectoral or specific industrial activities.

For these purposes, a distinction shall be made between two types of hydrants: Hydrants for filling trucks and direct flow hydrants.

3.2. Hydrants for filling trucks.

3.2.1. At least one hydrant shall be installed for filling trucks in the following cases:



Table 3.3.1.
HYDRANTS FOR FILLING TRUCKS DEPENDING ON THE CONFIGURATION, SURFACE AND LEVEL OF INTRINSIC RISK OF FIRE SECTORS OR AREAS

Configuration	Surface area of the fire sector or area (m ²)	Intrinsic risk level		
		Low risk	Medium risk	High risk
A _v	≥ 300	NO	YES	(Not applicable)
	≥ 1 000	YES ⁽¹⁾	YES	(Not applicable)
A _H	≥ 600	NO	YES	YES
	≥ 1 000	YES ⁽¹⁾	YES	YES
B	≥ 1 000	NO	NO	YES
	≥ 2 500	NO	YES	YES
	≥ 3 500	YES ⁽¹⁾	YES	YES
C	≥ 2 500	NO	NO	YES
	≥ 3 500	NO	YES	YES
	≥ 5 000	YES ⁽¹⁾	YES	YES
D	≥ 5 000	YES ⁽¹⁾	YES	YES

Table Notes:

Note 1: It is not necessary when the intrinsic risk is below 1.

3.2.2. In any case, at least one hydrant shall be installed for the filling of trucks if the total area of the industrial establishment (including the area built in buildings and that of the open spaces) is equal to or greater than 5 000 m², unless all its sectors and open spaces have an intrinsic risk level below 1.

3.2.3. The main function of these hydrants is the filling of the tankers of the Firefighting and Rescue Services.

When hydrants of this type are required, they must be located outside the building or open space to be protected, less than 100 m from the main entrances or accessible façades of the aforementioned buildings and areas, so that their accessibility to the Firefighting and Rescue Services is allowed.

3.2.4. This type of hydrants shall comply with the following conditions:

- a) If possible, in the case of hydrants not located on public roads, the distance between the location of each hydrant and the outer boundary of the protected building or area, measured perpendicular to the façade, must be at least 5 m.
- b) The minimum required pressure of the hydrant shall be 100 kPa (1 kg/cm²) at the outlet. The minimum flow rate shall be 500 l/min and the autonomy time shall be at least 60 minutes. (Note: The indicated flow rate and range time correspond to the total to be supplied to the hydrant network, regardless of the number of hydrants installed). The hydrants of this type that are installed may be connected to the public water supply network, without the need for a tank or pumping equipment, when it is able to provide the required pressure and flow rate.



- c) For the calculation of the equipment that is established can be considered the hydrants that are in the public road less than 100 m from the accessible façade or entrance of the aforementioned buildings and areas of the establishment.

3.3. Direct flow hydrants.

3.3.1. Direct flow hydrants shall be installed in the following cases:

Table 3.3.2.

DIRECT FLOW HYDRANTS DEPENDING ON THE CONFIGURATION, SURFACE AND LEVEL OF INTRINSIC RISK OF FIRE SECTORS OR AREAS

Configuration	Surface area of the fire sector or area (m ²)	Intrinsic risk level	
		Medium risk	High risk
A _H , B and C	≥ 2 500	NO	YES
	≥ 3 500	YES	YES
D ⁽¹⁾	≥ 10 000	YES	YES

Table Notes:

Note 1: If there are several adjacent areas, the joint surface of all of them must be computed, and those that are low risk may be excluded from the sum.

3.3.2. The main function of these hydrants is the direct flow of water to the areas to be protected by means of hoses or jet pipes, can also be used for the filling of trucks of the Firefighting and Rescue Services.

When according to the table above, a sector or area requires such a system of hydrants, these must be located in the outer perimeter of the buildings and open spaces, the installation must protect the perimeter of all buildings of the industrial establishment, as well as all fire areas. However, in the event that the industrial establishment consists of several separate buildings or open spaces, separated by more than 10 m (or a distance of at least the height of the stored combustible materials, if this is more than 10 m in open spaces) free of combustible goods, these may be considered separately for the purpose of assessing the need to place such hydrants in each building or open space.

3.3.3. The number of hydrants of this type to be installed and their characteristics shall be determined according to the following conditions:

- a) The protected area for each of them is covered by a radius of 40 m, measured horizontally from the site of the hydrant to the perimeter (façade) of the building, or to the open space to be protected. In open spaces (including the surroundings of buildings) hydrants should be able to reach the fire load areas to be protected such as loading docks or storage areas for combustible materials.
- b) In the case of establishments where part of the perimeter of the building is adjacent to another building and therefore this part of the perimeter is not accessible (in configurations type A_H or B), or, where there is no external perimeter surface for the placement of direct impulsion hydrants in an area, or, where there are other situations that make it impossible to install the hydrants in a



part of the perimeter of the building concerned, hydrants shall be located only in areas where it is feasible to do so, which must be justified.

- c) If possible, the distance between the location of each hydrant and the outer boundary of the protected building or area, measured perpendicular to the façade, should be between 5 and 15 m.
- d) They shall be identified as 'direct flow hydrants', by means of signalling or in the hydrant itself, so that they can be easily differentiated from hydrants for filling trucks.
- e) The establishment must have the necessary equipment to make use of the hydrants (hoses, diffuser nozzles, accessories and appropriate tools).
- f) The minimum pressure required for these hydrants shall be 500 kPa (5 kg/cm²) at the outlet, to counteract the loss of pressure of hoses and diffuser nozzles during direct water flow over fire.
- g) The flow rate and minimum range time shall be as follows:

Table 3.3.3.
FLOW RATE AND MINIMUM RANGE TIME OF DIRECT FLOW HYDRANTS

Configuration	Intrinsic risk level			
	Medium risk		High risk	
	Flow rate (l/min)	Minimum range (min)	Flow rate (l/min)	Minimum range (min)
A _H , B and C	1 500	60	2 000	90
D	2 000	60	3 000	90

Note: The indicated flow rates and minimum range times correspond to the total to be supplied to the hydrant network, regardless of the number of hydrants installed. In the case of several sectors or areas, the flow rates and times to be applied will be those corresponding to the area or sector with stricter values, provided that it has an area equal to or greater than that referred to in Table 3.3.2.

3.4. The direct flow hydrants installed according to section 3.3 can also be used to meet the requirements of having hydrants for filling trucks referred to in section 3.2, as long as they comply with the above.

3.5. Where several industrial establishments share the hydrant network with a supply system in accordance with section 2 of this Annex, it shall be designed for higher demand, and alternative and



exclusionary fire scenarios may be considered. In addition, its proper maintenance and accessibility must be ensured at all times by the owners of the various establishments that share it.

4. Fire extinguishers

4.1. Portable fire extinguishers shall be installed in all fire sectors of industrial establishments.

By way of derogation from the above, the non-installation of fire extinguishers may be justified in areas of automatically operated storage, where the activity prevents persons accessing it.

4.2. The extinguishing agent used shall be selected in accordance with the entry relating to extinguishers in Annex I to the RIPCI.

Where Class A and Class B fuels coexist in the fire sector, the fire class in the fire sector shall be considered to be A or B when the fire load provided by Class A or Class B fuels respectively is at least 90 per cent of the fire load in the sector. In another case, the fire class of the fire sector shall be considered A-B.

If the fire class of the fire sector is A or B, the fire extinguisher strength shall be determined in accordance with Table 3.4.1 or Table 3.4.2, respectively.

If the fire class in the fire sector is A-B, the fire extinguisher strength shall be determined by adding those required for each fire class (A and B), independently assessed according to Table 3.4.1 and Table 3.4.2 respectively.

Where Class C fuels exist in the fire sector that can provide a fire load that is at least 90 % of the fire load in the sector, the fire extinguishers shall be determined in accordance with the sector-specific regulations affecting them. In another case, the number of fire extinguishers shall not be increased if those required by the presence of other fuels (class A or B) are suitable for Class C fires.

Where Class D fuels exist in the fire sector, extinguishing agents of specific characteristics appropriate to the nature of the fuel, which may be projected on fire with fire extinguishers, or by manual means, shall be used in accordance with the particular situation and recommendations of the extinguishing agent manufacturer.

Table 3.4.1.

DETERMINATION OF THE PROVISION OF PORTABLE FIRE EXTINGUISHERS IN FIRE SECTORS WITH A FIRE LOAD PROVIDED BY CLASS A FUELS

Level of intrinsic risk of the fire sector	Minimum efficiency of the fire extinguisher	Maximum protected area of the fire sector
Low risk	21 A	Up to 600 m ² (one more extinguisher per 200 m ² , or fraction, in excess)
Medium risk	21 A	Up to 400 m ² (one more extinguisher per 200 m ² , or fraction, in excess)
High risk	34 A	Up to 300 m ² (one more extinguisher



		per 200 m ² , or fraction, in excess)
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Table 3.4.2.

DETERMINATION OF THE PROVISION OF PORTABLE FIRE EXTINGUISHERS IN FIRE SECTORS WITH A FIRE LOAD PROVIDED BY CLASS B FUELS

	Maximum volume (V) of liquid fuels in the fire sector ^{(1) (2) (3)}			
	V ≤ 20	20 < V ≤ 50	50 < V ≤ 100	100 < V ≤ 200
Minimum efficiency of the fire extinguisher	113 B	113 B	144 B	233 B

Table Notes:

Note 1: Where more than 50 percent of the volume of liquid fuels (V) is contained in perfectly sealed metal containers, the minimum efficacy of the extinguisher may be reduced to the immediately preceding efficacy of class B.

Note 2: When the volume of liquid fuels in the fire sector or area (V) exceeds 200 litres, the provision of portable extinguishers shall be increased by adding mobile extinguishers on wheels of minimum efficiency II B (e.g. 50 kg of BC or ABC powder, or an equivalent of water with additives), for the following reasons:

- a) An extinguisher, if V is greater than 200 litres and less than or equal to 750 litres.
- b) Two extinguishers, if V is greater than 750 litres.
- c) In the case of sectoral or specific regulations, the provisions of this table shall apply.

Note 3: For the purposes of Table 3.4.2, it should be noted that flammable liquids are combustible materials.

4.3. In the case of fires that occur in the presence of electrical appliances or switchboards, conductors or other elements with electrical voltage, it must be verified that the extinguisher chosen is suitable for that voltage.

4.4. The location of the portable extinguishers shall allow them to be easily visible and accessible, they shall be located close to the points where the fire is most likely to start and their distribution shall be such that the maximum horizontal route, from any point in the fire area to the extinguisher, does not exceed 15 m.



4.5. Portable fire extinguishers shall be installed in all fire areas of industrial establishments (type D configuration), except in areas with an intrinsic level of risk below 1. The allocation of these will be carried out in accordance with the provisions of the previous paragraphs, except in relation to the maximum route up to one of them, which may be extended to 25 m.

5. Equipped fire-hydrant systems

5.1. Equipped fire hydrants (BIE) systems will be installed in the fire sectors, in the following cases:

- a) In configurations of type A_v: Sectors with a built surface area of 300 m² or greater.
- b) In configurations of type A_H or B:
 - i. Sectors with average intrinsic risk level and built surface area of 500 m² or greater.
 - ii. Sectors with high intrinsic risk level and built surface area of 200 m² or greater.
- c) In Type-C configurations:
 - i. Sectors with average intrinsic risk level and built surface area of 1 000 m² or greater.
 - ii. Sectors with high intrinsic risk level and built surface area of 500 m² or greater.
- d) In Type D configurations: Areas of high intrinsic risk level and with an occupied area of 5 000 m² or greater. In case of several adjacent high-risk areas, the joint surface of all of them must be computed.

By way of derogation from the above, the non-installation of equipped fire hydrants may be justified in areas of automatically operated storage, where the activity prevents access persons from accessing it.

In the case of sectors dedicated exclusively to housing electrical or electronic equipment, it will be permitted for BIEs to be placed on the outside near the entrance, so that they can reach the interior, or for the BIE not to be provided, as long as there are fixed automatic firefighting systems adapted to this type of risk.

5.2. Type of BIE and water needs.

The BIE network shall ensure the pressure, flow and operating time conditions set out in Annex I to the RIPCI.

The types of BIE to be provided shall be as follows:

Table 3.5.1.
BIE REQUIREMENTS DEPENDING ON THE LEVEL OF INTRINSIC RISK
OF THE FIRE SECTOR OR AREA

Intrinsic risk level	Type of BIE
Low risk	25 mm
Medium risk	25 mm ⁽¹⁾



High risk	45 mm ⁽²⁾
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Table Notes:

Note 1: In places that previously had 45 mm BIE installed (in case of reforms) these will be accepted as valid, without the need to replace them with BIEs of 25 mm.

Note 2: 25 mm BIEs will be allowed with an additional 45 mm socket and in this case it shall be considered for hydraulic calculation purposes as 45 mm BIE, having to be sized to operate with the flow and pressure requirements of both types of BIE.

6. Dry riser systems

6.1. Dry riser systems will be installed in industrial establishments if their evacuation height is 15 m or higher.

6.2. These risers will have outlets on all floors.

7. Fixed automatic firefighting systems

7.1. Fixed automatic sprinkler firefighting systems

7.1.1. Fixed automatic firefighting systems, such as automatic sprinkler systems, will be installed in the fire sectors when the following occur in them:

1°. Manufacturing activities and other similar processes, such as production, processing, repair or others other than storage, in the following cases:

- a) In configurations of type A_V: Sectors with average intrinsic risk level and built surface area of 500 m² or greater.
- b) In configurations of type A_H:
 - i. Sectors with average intrinsic risk level and built surface area of 1 500 m² or greater.
 - ii. Sectors with high intrinsic risk level and built surface area of 750 m² or greater.
- c) In Type-B configurations:
 - i. Sectors with average intrinsic risk level and built surface area of 2 500 m² or greater.
 - ii. Sectors with high intrinsic risk level and built surface area of 1 000 m² or greater.
- d) In Type-C configurations:
 - i. Sectors with average intrinsic risk level and built surface area of 3 500 m² or greater.
 - ii. Sectors with high intrinsic risk level and built surface area of 2 000 m² or greater.

2°. Storage activities, in the following cases:



- a) In configurations of type A_V: Sectors with average intrinsic risk level and built surface area of 300 m² or greater.
- b) In configurations of type A_H:
 - i. Sectors with average intrinsic risk level and built surface area of 1 000 m² or greater.
 - ii. Sectors with high intrinsic risk level and built surface area of 600 m² or greater.
- c) In Type-B configurations:
 - i. Sectors with average intrinsic risk level and built surface area of 1 500 m² or greater.
 - ii. Sectors with high intrinsic risk level and built surface area of 800 m² or greater.
- d) In Type-C configurations:
 - i. Sectors with average intrinsic risk level and built surface area of 2 000 m² or greater.
 - ii. Sectors with high intrinsic risk level and built surface area of 1 000 m² or greater.

Note: Where there are both manufacturing and permanent storage activities in a sector (without considering as such the 'day store'), the installation of these systems shall be necessary where the sum of the ratios between the area intended for manufacture and that intended for storage, between the area from which the installation is mandatory in each case, is equal to or greater than 1, as follows:

$$\left[\left(\frac{\text{Surface}_{\text{manufacture}}}{\text{Surface}_{\text{on the basis of what is mandatory for manufacturing}}} \right) + \left(\frac{\text{Surface}_{\text{storage}}}{\text{Surface}_{\text{on the basis of what is mandatory for storage}}} \right) \right] \geq 1$$
, and must be the sum of both areas equal to the area of the sector.

7.1.2. In low-risk sectors where manufacturing areas coexist with large storage areas with non-uniform fire load density between them, the calculation of the NRI for each of these areas shall be made in addition, and fixed automatic firefighting systems shall be available throughout the sector in the event that any of them is of an average or high intrinsic risk level, with an area equal to or greater than that referred to in section 7.1.1. This paragraph will not apply if areas with higher fire load density are distributed within the sector grouped on lower surfaces.

7.1.3. Automatic sprinklers may be replaced with other types of fixed automatic firefighting systems referred to in the RIPCI, provided that these are adequate and provide at least the same level of safety for the specific place and use.

7.2. Fixed firefighting systems using water spray

Water-spray systems shall be installed when the configuration, content, process and location of the risk requires cooling parts of the risk to ensure the stability of its structure and avoid the effects of radiation heat emitted by another nearby risk. They will also be installed in those fire sectors and areas where its installation is mandatory in accordance with the provisions in force that regulate fire protection in sectoral or specific industrial activities.

7.3. Fixed foam firefighting systems

Foam systems will be installed in those fire sectors and areas where their installation is mandatory in accordance with the provisions in force that regulate fire protection in industrial, sectoral or specific activities.



When such systems are installed, it should be verified that they are appropriate for the risk to be protected, according to their specifications.

7.4. Fixed powder firefighting systems

Powder firefighting systems will be installed in those fire sectors where their installation is mandatory in accordance with the provisions in force that regulate fire protection in sectoral or specific industrial activities.

7.5. Fixed firefighting systems using gaseous extinguishing agents

Where the installation of fixed automatic firefighting systems is required, gaseous firefighting systems shall preferably be installed in the fire sectors of industrial establishments, where they constitute enclosures dedicated to housing electrical or electronic equipment, calculation centres, data banks, control or measurement centres and the like, and where protection with water systems may damage such equipment. They will also be installed in those fire sectors where their installation is mandatory in accordance with the provisions in force that regulate fire protection in sectoral or specific industrial activities.

In any case, this type of system can only be installed and used when the safety and evacuation of people is guaranteed. Otherwise, a different type of fixed extinguishing system should be installed.

8. Smoke and heat control systems

8.1. The elimination of smoke and gases from combustion and with them the heat generated, from the spaces occupied by fire sectors of industrial establishments, must be carried out in accordance with their titration, risk and other characteristics that determine the movement of smoke.

8.2. Systems will be installed for the control of smoke and heat in the fire sectors when the following occurs in them:

1º. Manufacturing activities and other similar processes, such as production, processing, repair or others other than storage, in the following cases:

- a) In sectors of medium intrinsic risk and with a built surface area of $\geq 2\,000\text{ m}^2$.
- b) In sectors of high intrinsic risk and with a built surface area of $\geq 1\,000\text{ m}^2$.

2º. Storage activities, in the following cases:

- a) In sectors of medium intrinsic risk and with a built surface area of $\geq 1\,000\text{ m}^2$.
- In sectors of high intrinsic risk and with built surface area of $\geq 800\text{ m}^2$.



Note: Where there are both manufacturing and permanent storage activities in a sector (without considering as such the 'day store'), the installation of these systems shall be necessary where the sum of the ratios between the area intended for manufacture and that intended for storage, between the area from which the installation is mandatory in each case, is equal to or greater than 1, as follows:

$$\left[\left(\frac{\text{Surface}_{\text{manufacture}}}{\text{Surface}_{\text{on the basis of what is mandatory for manufacturing}}} \right) + \left(\frac{\text{Surface}_{\text{storage}}}{\text{Surface}_{\text{on the basis of what is mandatory for storage}}} \right) \right] \geq 1$$
, and must be the sum of both areas equal to the area of the sector.

8.3. The design and implementation of the systems referred to in section 8.2 shall be carried out in accordance with the heading for those systems in Annex I to the RIPC, in accordance with section 13.1.a) of temperature control and smoke evacuation systems based on buoyancy strategies. In particular cases where the technical inadvisability of installing a system as referred to in section 13(1) (a) is justified, it may be replaced with other systems referred to in the RIPC (Annex I, section 13(1)), provided that the system is justified for the specific place and use.

Temperature control and smoke evacuation systems based on buoyancy strategies shall be designed on the basis of the following objectives:

- a) In cases of habitual presence of persons, with a sector occupancy density of more than 10 people per 100 m², or, when it is more than 5 people per 100 m² and the ceiling height is less than 5 m, the system must be designed with the objectives of protecting the means of evacuation and facilitating firefighting operations.
- b) In cases of reduced presence of persons, it should be designed with the objectives of facilitating firefighting operations; and in addition, protection of goods, or temperature control of gases.
- c) Alternatively to points (a) and (b), the design may be justified on the basis of other objectives if the specific case so requires.

8.4. In sectors of medium or high risk smaller than the size indicated in section 8.2, provided that they are at least 100 m², systems for the control of smoke and heat according to section 8.3 will be installed or, alternatively, ventilation holes may facilitate the extraction of fumes (which shall not be counted as systems for the control of smoke and heat, these being a simplified solution), and as a reference for their design (and being outside the scope of the RIPC) the following hole values can be taken as a reference, due to:

- a) A minimum of 0.5 m² aerodynamic ventilation surface per 200 m² of built surface area or fraction, in fire sectors with manufacturing activities and other similar processes located on any floor above ground level.
- b) A minimum of 0.5 m² aerodynamic ventilation surface per 150 m² of built surface area or fraction, in fire sectors with manufacturing activities and other similar processes located on a floor below ground level, and also, in fire sectors with storage activities located in any floor above ground level.
- c) A minimum of 0.5 m² aerodynamic ventilation surface per 100 m² of built surface area or fraction, in fire sectors with storage activities located on a floor below ground level.

Note: 'Aerodynamic surface' means that resulting from multiplying the net surface of the hole in the cover or single-partition wall by a 'discharge coefficient', the value of which is less than 1 due to losses by mechanisms, slats, gates, etc.

Preferably, the holes will be arranged evenly distributed in the upper part of the sector, either in high façade or roof areas. The holes can be manually, automatically or permanently open. In addition, holes



for air intake in the lower part of the sector must be available, in the same proportion of surface required for smoke outlets, and the gaps in the access doors to the sector that communicate directly with the outside may be computed.

The ventilation will be natural, unless the technical non-advisability of this solution (when the location of the sector prevents it) is justified, where it can be forced. In this case, when ventilation needs to be forced, the system shall comply with the RIPCI, designed in accordance with Annex I, section 13.1(d), with the following characteristics:

- a) It shall be sized for an extraction flow corresponding to 6, 9 or 12 renewals per hour of the sector volume corresponding to the natural ventilation ratios indicated in paragraphs (a), (b) and (c) above.
- b) Extractors must have an F_{400} 120 rating. If ducts are used for the extraction of smoke or for the supply of air that are immersed in the fire area, they must have an E_{600} 60 classification if they run through a single sector or EI 120 if they pass through fire partitioning elements.
- c) The air supply shall be carried out naturally unless the location of the sector prevents it, in which case it shall be carried out mechanically in the lower part of the sector at a maximum proportion of 80% of the flow required for the smoke outlet and with only manual activation by the SEIS from an easily accessible and locatable control post.

Note: These parameters allow the design of a forced system equivalent to the solution of natural ventilation gaps described in the previous paragraphs, for cases where a simplified solution is chosen (not assimilable to that of section 8.3).

9. Emergency lighting

9.1. Emergency lighting shall comply with the applicable requirements of section 4 'Safety against risk caused by inadequate lighting' of the Basic Document of Safety of Use and Accessibility of the Technical Building Code (CTE DB-SUA 4).

10. Signalling of means of protection

10.1. Manually used fire protection means (such as fire extinguishers, alarm buttons, BIEs or hydrants) shall be marked to facilitate their location.

10.2. Such marking shall comply with Part 2 of Annex I to the RIPCI.



ANNEX IV AREAS WITH PARTICULAR CONDITIONS

This Annex covers several unique cases of areas or parts of establishments which, by virtue of their characteristics, may differ partially from the characterisation of Annex I or from the requirements of Annexes II and III, or which require specific considerations.

1. Storage spaces with storage systems using metal shelves

1.1. Scope and classification.

Large storage spaces are characterised by storage systems using metal shelves. These can be classified as self-supporting or independent. Both, in turn, can be automatic or manual, as defined below:

- a.1) Self-supporting storage system: System designed to withstand both the load of the stored goods as well as the walls or cover, acting as part of the structure of the building.
- a.2) Separate storage system: It only supports the stored goods, being formed by detachable structural elements independent of the structure of the building.
- b.1) Automatic storage system: The load units that are stored are transported and raised by means of an automatic operation, without the presence of people in the shelving area.
- b.2) Manual Storage System: The cargo units that are stored are transported and raised by manual operation (either by hand or assisted by pallet trucks, trucks or lift platforms, etc.), with the presence of people.

	Self-supporting	Independent
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Figure 4.1. Classification of storage systems using metal shelves

1.2. General requirements for all storage systems using metal shelves.

- a) The materials of frames, rails, metal panels, trusses, beams, metal floors and other elements and metal accessories that make up the system must be of fire reaction class A1.
- b) Coatings (e.g. painted or coated) must be of at least the kind of reaction to fire B-s3,d0.

1.3. Specific requirements for storage systems on self-supporting metal shelves.

- viii. For the main structure of self-supporting storage systems with metal shelves (operated manually or automatically), it shall be permissible not to justify their fire resistance provided that they are protected by an automatic sprinkler system or other equivalent fixed automatic extinguishing system, and in addition, they are located in buildings of type B or C.

In other cases of self-supporting storage systems (not protected by fixed automatic firefighting systems, or located in buildings of type A_H or A_V), the fire resistance of its main structure shall be at least that required in Part 5 of Annex II for structures with a bearing function.

- ix. In self-supporting storage systems of slender dimensions (higher than width) of more than 3 m high, it should be justified that, in case of collapse, this does not occur towards the outside of the building.

1.4. Specific requirements for storage systems on independent metal shelves.

- a) It is not necessary to justify the fire resistance of the structural elements of the storage system provided that the shelf structure is independent of the structure of the building.



1.5. Specific requirements for manually operated metal shelving systems.

- a) Evacuation at the sites of manually operated storage systems (independent or self-supporting) shall be as specified in section 3 of Annex II, with the additional considerations set out in the following paragraphs.
- b) In the case of automatic sprinkler systems, smoke and heat control systems or other protection systems listed in Annex III, the minimum distances required in each case (e.g. between the stored load and the roof) must be respected to ensure the proper functioning of those systems.
- c) The dimensions of the shelves will have no other limitation than that corresponding to the designed storage system.
- d) There must be cross-sections between shelves, which must be distanced from each other at maximum lengths of 20 m, and this distance may be extended to 40 m if there are at least two or more alternative outlets and a fixed automatic extinguishing system is available. The dimensions of these steps shall be at least 1 metre wide and 2.2 m high.

1.6. Specific requirements for automatically operated metal shelving systems.

- a) Evacuation at the sites of automatically operated storage systems (independent or self-supporting) shall be as specified in Part 3 of Annex II, this being applicable only in areas where people may be present regularly. Areas intended exclusively for automated storage can be considered as unoccupied areas.
- b) Sufficient openings should be available on the accessible façade or entrances, as required in Annex II, to ensure access for SEIS staff at ground level.
- c) In addition, the considerations set out in section 1.5(b) and (c) above also apply to them.

2. Mezzanines and sub-floors

2.1. Scope and classification.

It is possible that the storage systems listed in section 1 of this Annex may have areas with horizontal surfaces envisaged for the passage of persons that, without being considered as floors of the building as such, have certain characteristics similar to them. These areas can be classified as overpasses or sub-floors, as defined below:

- Raised walkway: Storage system that has one or more upper usable levels that allow access to the shelf at all heights. It may be occupied by the personnel handling the loads.
- Mezzanine on shelves: Storage system that allows for creating diaphanous surfaces in height, supported by the shelves themselves and with the capacity to withstand an overload of use or the actions of other installations fixed on them. This system is supported by a shelf belonging to another storage system. It may be occupied by the personnel handling the loads.

- Mezzanine on pillars: Storage system on pillars, which allows creating diaphanous surfaces in height, with the capacity to withstand an overload of use or the actions of other installations fixed on them. This system consists of pillars on which a horizontal network is fixed, on which the floor or useful surface rests. It may be occupied by the personnel handling the loads.

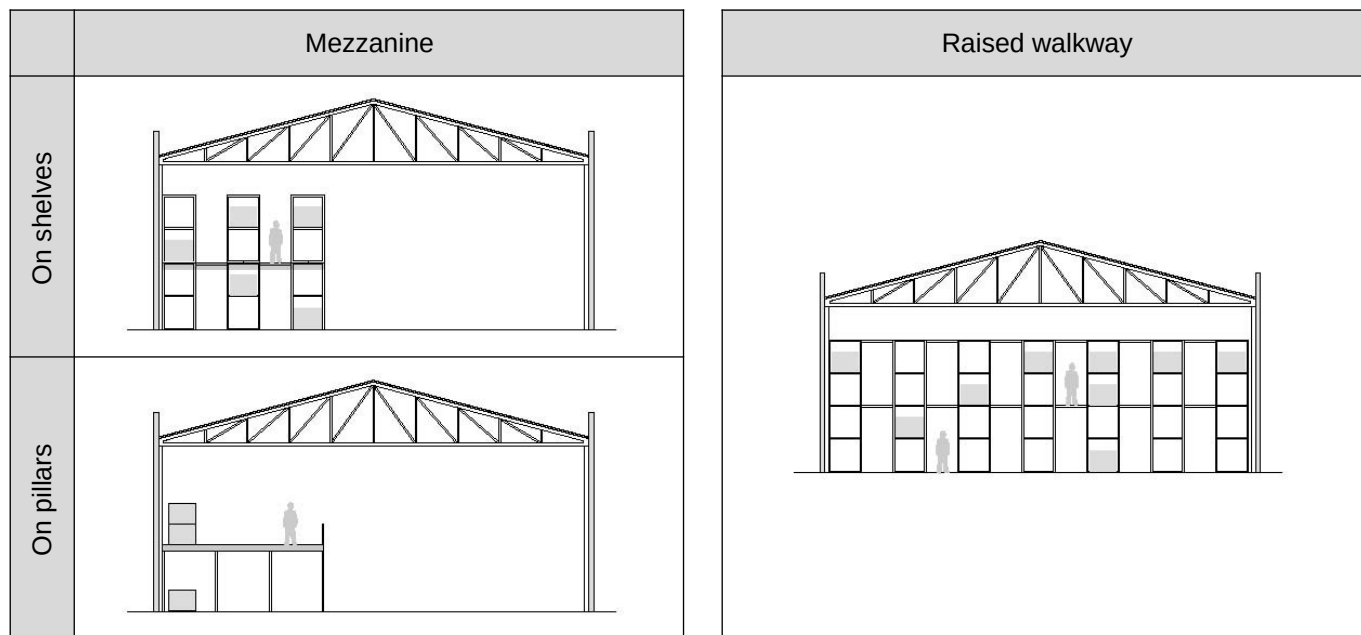


Figure 4.2. Classification of raised walkways and mezzanines

2.2. Requirements.

In the case of mezzanines and raised walkways in a building of an industrial establishment, the following considerations shall apply:

- Any mezzanine or raised walkway where there is a fixed work station or the collapse of which may cause personal injury (e.g. a work station under the sub-floor), compromising overall stability, evacuation or compartmentalisation, shall be considered as load-bearing structure and shall therefore comply with the conditions of Table 2.5.1, 'Minimum fire resistance of the main structural elements with a bearing function', in Annex II. For these purposes, the load-bearing structure to be considered are the supports of these walkways or mezzanines, their floors or top slabs and access stairs. Access stairs must also comply with the conditions laid down for evacuation routes.
- Any mezzanine or raised walkway intended solely for storage where there is no fixed work station and its occupation is occasional, but whose occupancy density is greater than 1 person per 5 m² or whose total area exceeds 50 m² (including usable areas and storage areas) shall be considered as origin of evacuation and comply with the conditions of Table 2.5.1 of Annex II. Access stairs must also comply with the conditions laid down for evacuation routes.
- In the rest of cases (mezzanines or raised walkways intended only for storage where there is no fixed work station either above or below, its occupation is punctual, the occupancy density is not



greater than 1 person per 5 m² and its total area does not exceed 50 m²) will be considered storage and, therefore, it must comply only with the requirements established for storage systems.

- f) As an alternative to the fire resistance required in paragraphs (a) and (b) above, it may be decided not to justify the fire resistance of the mezzanine raised walkway load-bearing structure when they are located in buildings of type B or C (or A_H or A_V if this structure is independent from that of the building) and in addition the entire fire area considered has a fixed automatic extinguishing system (which must protect all levels and should be required to protect all levels). be effective in achieving the cooling of the structure) and a system for the control of smoke and heat according to section 8.3 of Annex III. The adoption of these measures shall apply only to sub-floors or overpasses the configuration of which allows rapid heat and smoke dissipation and the proper functioning of the firefighting systems. In addition, the length of evacuation routes originating in those areas should not exceed that indicated in Table 2.3.1 of Annex II, and note 4 to that table is not applicable in this case.
- g) In cases (a), (b) and (d) the surface area of the walkways or mezzanines is calculated together with that of the fire area in which they are located and, in addition, those areas should be equipped with the fire protection facilities listed in Annex III.
- h) For the classes of reaction to fire of the construction elements of the mezzanines and raised walkways, the same requirements as are required for floors and ceilings will apply in Table 2.1.4 of Annex II.
- i) For the purpose of applying Annex II, buildings with mezzanines or raised walkways cannot be considered as single-storey buildings, unless their surface area is of little relevance to the total area of the sector (understood as such, that which occupies less than 15 % of the area of the sector).

3. Open spaces occupied by supporting structures of enclosures formed by textile elements

3.1. The open spaces occupied by enclosure supporting structures formed by textile elements both on the roof and in the perimeter enclosure, such as tents, shall comply with the same conditions as those applicable to fire areas (type-D configuration) in Annexes II and III, taking into account the following particularities:

- For Annex II, section 5 ('Structural fire resistance'), the enclosure supporting structures formed by textile elements shall be at least R 30, except where it is demonstrated that the textile element, in addition to being T2 level according to UNE-EN 15619 or C-s2,d0 according to UNE-EN 13501-1, has, in all its covering layers, a surface perforation equal to or greater than 20 cm² after the test defined in UNE-EN 14115.
- For the evacuation of occupants and emergency lighting, requirements similar to those required for buildings, as indicated in their respective sections of Annexes II and III, shall be met.
- Concerning Annex III(8), 'Systems for smoke and heat control', such systems should be available when determined on the basis of surface area and risk level. Alternatively, when replacing these systems, it may be accepted that there are gaps or open areas (permanently open or manually or automatically opened) in the structure that allow the rapid evacuation of fumes in the event of the



start of a fire, it must be justified that the smoke is allowed to evacuate during the first stages of the fire.

- The perimeter distances set out in point 1.5(a) of Part 1 of Annex II between the perimeter of the supporting structure and adjacent buildings or establishments shall apply.
- The other requirements to be met shall be similar to those applicable to fire areas (type D configuration) in Annexes II and III.

3.2. In the case of structures with mixed enclosures, i.e. that they are made up jointly of parts with textile enclosures and parts with rigid enclosures (non-textile construction elements), provided that the cover is entirely textile enclosures (may be rigid perimeter enclosures) and having a single floor without intermediate elements and a single fire area, they shall be classified as type-C configuration, having to comply with the characteristics of this configuration according to Annex I and its corresponding requirements set out in Annexes II and III, and taking into account the following particularities:

- a) With regard to Annex II, Part 5, its structure shall have at least the strength (R) applicable in type C configuration, except where it is demonstrated that the textile element, in addition to being level T2 according to UNE-EN 15619 or C-s2,d0 according to UNE-EN 13501-1, has, in all its covering layers, a perforation of surface equal to or greater than 20 cm² after the test as defined in UNE-EN 14115. In this case, the requirement of section 1(3)(4) of Part 5 of Annex II, relating to the marking of this particularity, also applies.

3.3. For other cases of structures with mixed enclosures, the provisions of sections 3(1) and 3(2) above shall not apply, and must be classified as configuration type A, B, C or D as appropriate, and comply with the relevant requirements.

4. Storage of specific products

Particular requirements are detailed below for specific product storages with special features.

4.1. Cereals, flours, feed and other products comparable to these

For the storages indicated, the following considerations shall apply:

4.1.1. Scope.

These requirements shall apply to establishments in type-C buildings with sectors with a high intrinsic risk level intended exclusively for bulk storage of materials with the following characteristics:

- a) Their combustion happens slowly, practically without flames and with lower temperatures than in the case of more conventional fuels (plastics, paper, cardboard, wood, liquid fuels, etc.).
- b) Active fire protection facilities based on water extinguishing mechanisms established in the regulation are not effective for the control and extinguishing of fire of these materials: On the one hand, because their combustion is internal to the storage cell and, on the other hand, and



specifically those referring to automatic water sprinkler systems, because the fire does not cause the temperature increase necessary for its activation.

- c) The mechanisms of extinguishing with water can cause their subsequent self-ignition.

These characteristics must be justified in the project of the establishment, by means of literature or specific tests, in particular the time-temperature ratio of their combustion. In any case, cereals, feed and flour shall be considered to be included among these materials.

The sectors where these materials are stored cannot include facilities ancillary to the activity such as drying facilities, etc.

4.1.2. For the application of Annexes II and III to this Regulation, the following additional considerations shall apply to such storage:

- a) Surface area of fire sectors: Sectors up to 6 000 m² can be available. Sectors with areas greater than that indicated are possible after carrying out a tailor-made study, applying the route of Article 5(1)(b).
- b) Evacuation routes: The maximum length of evacuation routes can be 50 m if two or more alternative exits are available, or 35 m if a single exit is available. These accesses must be suitable so that the material stored with the working machines can be removed in the event of fire.
- c) Exterior space next to the façade: A free space of 10 m wide should be available close to the exits, that is sufficient for the laying of this material and then soaked for extinguishing.
- d) Manual fire alarm systems (manual buttons): Manual push-buttons shall be available when provided for in Annex III. For this purpose, the placement of manual buttons inside the bay can be avoided and it can be possible to have buttons only at each of the accesses from the outside.
- e) Automatic fire detection systems (detectors): Detection systems shall be available when provided for in Annex III. For this purpose, it is possible to opt for an automatic detection system appropriate to the type of establishment and activity developed, proposing barrier or aspiration detection systems, or, in certain cases (depending on the type of environment) the use of thermal cable or temperature probes, or alternatively, flame detectors may be considered more appropriate.

Alternatively to the use of such systems, it may be decided to carry out weekly checks of the internal temperature of the piles of material to detect possible internal combustions. Temperature probes will be located uniformly throughout the storage area to ensure representative data are recorded.

- f) Fire extinguishers: Fire extinguishers shall be available when provided for in Annex III. To this end, the placement of these extinguishers inside the bay can be avoided it can be possible to have only one extinguisher in each of the accesses from the outside.
- g) Equipped Fire Hydrants (BIE): BIEs shall be available when provided for in Annex III. To this end, you can ignore the placement of these inside the industrial unit and have only one BIE in each of the accesses from the outside. It is necessary to have a BIE that serves in the



intended area to extract the material and spread it in order to soak it, or a hydrant to replace it located less than 40 m from this area.

These BIEs will be 25 mm with an independent 45 mm coupling, with a built-in spanner, for use by fire-fighters.

- h) Automatic water-sprinkler systems: It is not considered necessary to have automatic water sprinklers in this type of warehouse given the uniqueness of the stored material and its combustion.
- i) Smoke and heat control systems: Such systems shall be available when provided for in Annex III. Permanent openings at deck level or at high levels of façade shall preferably be chosen in order to ensure that the dust will not prevent the opening of closed elements.

To carry out the design of the system (according to UNE 23585 in the RIPCI) it will be considered that the standard fire dimensions must be those corresponding to Category 4, even if the storage height is higher than the critical, understanding that this facility will only serve to facilitate the evacuation of people and the action of the extinguishing services in the initial stages of the fire.

- j) The remaining requirements of Annexes II and III not listed here shall apply in full.

5. Refrigeration rooms

5.1. Scope.

This section applies to refrigeration rooms that occupy an entire building, which make up a fire sector, or that are located within one (occupying only part of that sector) of an industrial establishment, as an alternative in those cases where one of the requirements laid down in Annex III cannot reasonably be applied.

5.2. Considerations for the implementation of Annex III.

- a) In refrigeration rooms with operating temperatures below 4°C, the installation of BIE systems inside shall not be required, in which case, when installation is required in accordance with Annex III, section 5.1, they must be installed next to their entrances.
- b) Refrigeration rooms with dimensions equal to or greater than the surfaces specified in section 8.2 of Annex III shall have a smoke and heat control system covering the interior of the chamber, in accordance with the criteria set out in sections 8.2 and 8.3 of Annex III.
- c) Refrigeration rooms located within fire sectors which, pursuant to section 8.2 of Annex III, are required to have a system for the control of smoke and heat, must have such a system in such a way that it covers both the sector and the refrigeration room itself, with the following considerations:

The sector containing the chamber shall have such a system in accordance with the criteria set out in sections 8.2 and 8.3 of Annex III.



Refrigeration rooms located inside these sectors must also have such a system if the size of the chamber itself is equal to or greater than the surfaces indicated in section 8.2. On the other hand, where the chamber is of lower dimensions, being equal to or greater than 100 m² and located in medium or high risk sectors, the system indicated in section 8.4 of Annex III may be available, or alternatively, the following measures may be applied:

- i. Automatic detection and fire alarm shall be installed in refrigerated enclosures. The alarm will also be audible from the outside of the room.
 - ii. Automatic sprinklers will be installed in refrigerated enclosures from 500 m² surface area. The sprinklers must cover both the inside of the chamber and the sector in which they are framed. The type of sprinklers to be used should be appropriate so that they can operate at the temperature of the refrigeration room. Alternatively to the installation of automatic sprinklers, the installation of an inertisation system in the chamber, designed according to the UNE-EN 16750 standard, will also be supported.
- d) In cold rooms that make up fire sectors, or which are located inside fire sectors to which a simplified system (ventilation holes) is permitted pursuant to Annex III, section 8.4, their installation inside the chamber shall not be required if it is less than 100 m², but shall be in the sector that contains it (in cases where the chamber occupies only part of the sector). Where the cold room itself is equal to or greater than 100 m² and is located in medium or high risk sectors, the system specified in section 8.4 of Annex III shall also be available within it, or alternatively the following measure may be applied:
- i. Automatic detection and fire alarm shall be installed in refrigerated enclosures. The alarm will also be audible from the outside of the room.
- e) Refrigeration rooms which make up fire sectors, or which are located inside fire sectors, that are required by Annex III, section 7.1, for a fixed automatic extinguishing system, that system shall cover the interior of the chamber as well as the sector in which it is located (in cases where the chamber occupies only part of the sector). The type of system to be used should be appropriate so that it can operate at the temperature of the refrigeration room. Alternatively, the installation of an inertisation system inside the chamber, designed according to UNE-EN 16750, will be allowed.

6. Installations located on roofs of buildings

The existence of installations outside, on the roofs of the buildings of industrial establishments, is not expressly mentioned in Annexes I to III of the Regulation. For this reason, some considerations about them are detailed in this section.

6.1. Scope.

Installations located outside, on roofs of buildings of industrial establishments, which may represent an impact on the safety in the event of fire of the establishment.

6.2. General considerations for all types of facilities on roofs.



- a) Specific legislation applying to each installation type, including product legislation regulating their elements or components, shall be taken into account.

In cases where there is no specific legislation, or the legislation does not cover safety risks in the event of a fire, the specific case of the building where the facilities are to be located, as well as their characteristics and conditions of use, should be examined and taken into account. If it is determined that these may pose a significant risk to safety in the event of a fire, appropriate solutions must be provided.

- b) With regard to the calculation of the intrinsic risk level (NRI) in Annex I, it is not necessary to consider the fire load of these elements as part of the fire area below the deck, as they are located outside the buildings.

6.3. Specific considerations for installations of photovoltaic panels on roofs.

- a) Consideration should be given to the design and technology of the panels and their auxiliary components, the materials with which they are manufactured (combustibility), as well as the possible existence of protective elements that improve their safety (such as elements that prevent the onset of the fire, or that extinguish or control it). The current state of the art should be taken into account when using panels and components with the best available performance, and based on this, it should be determined whether these installations are safe on their own, or whether they require additional measures to be implemented which, at a minimum, will be those indicated in the following paragraphs.
- b) It should be possible that in the event of fire the current of this installation is cut off in order to facilitate a safe intervention.
- c) Priority is given to the possibility of the SEIS being able to intervene quickly, by means of the requirements set out in Annex II, Part 4 'Fire-fighter intervention'. To do this, account must be taken of the situation and height of the roof covering, its accesses and whether it is passable or accessible from the outside of the roof covering.
- d) In large installations (those with a side greater than 45 m in length) the plates must be separated into groups of maximum dimensions of 45 m. by 45 m., leaving free strips between them that hinder the spread of a possible fire, as well as facilitate intervention. The width of these stripes must be at least 1.2 m. In addition, from a surface area of 500 m² upwards, a perimeter strip of 1 metre wide shall be available around the installation.
- e) It should be avoided that deck installations may facilitate the spread of a possible fire between several sectors of an establishment, or from (or to) other adjacent establishments or buildings, either by location or arrangement, by wiring or by other equipment or ancillary components that may exist. The minimum compartmentalisation distances set out in Figures 2.11, 2.12, 2.13, 2.15 and 2.16 (as applicable) of Part 2(2) of Annex II, section 2 'Roof coverings in buildings' shall be respected, including for combustible elements (such as photovoltaic panels) above the deck.
- f) The characteristics of the roof should be taken into account and if there is a risk that a fire started in photovoltaic installations (in panels or other auxiliary components) could spread or cause damage to the lower floors. To do this it can be chosen either to place the installation in roofs that because of their characteristics do not allow the fire to expand easily, such as those that have a class of reaction to fire B_{ROOF} (t1), or alternatively, place between the installation and the cover a



layer that achieves the same effects. There may be no areas of the deck which do not meet these characteristics either below the installations or less than one metre from their perimeter.

- g) In addition to paragraphs (e) and (f), as regards cables and tubes leading the wiring, these shall have sufficient characteristics and protection not to transfer the fire to other spaces. Special care will be taken in the passage of tubes and cables between roof coverings of different sectors and when passing from the covering to the interior of the sector. In addition, the requirements of Part 1(2) of Annex II 'Concealed spaces' apply for wiring inside or below the covering.
- h) The need to apply paragraphs (d) and (f) may be waived in the case of a fixed automatic extinguishing system that is suitable for protecting such installations.

ANNEX V LIST OF UNE AND OTHER INTERNATIONALLY RECOGNISED STANDARDS

DOCUMENT	TITLE
UNE-ISO 23932:2017	Fire safety engineering. General principles.
UNE-ISO 16733-1:2017	Fire safety engineering. Selection of design fire scenarios and design fires. Part 1: Selection of design fire scenarios.
UNE 192005-1:2014 (UNE 192005:2014)	Procedure for regulatory inspection. Fire safety in industrial establishments.
UNE-EN ISO 1716:2021	Fire reaction tests on products. Determination of the higher heat value (heat value).
UNE-EN IEC 60331-1:2020	Tests for electrical cables in fire conditions. Integrity of the circuit. Part 1: Fire test method with impact at a temperature of at least 830°C for rated voltage cables up to and including 0.6/1.0 kV and with a total diameter exceeding 20 mm.
UNE-EN 50200:2016	Method of testing the fire resistance of small, unprotected cables for use in emergency circuits.
UNE-EN 1154:2003	Building hardware. Controlled door closing devices. Requirements and test methods.
UNE-EN 1155:2003	Building hardware. Electrically powered hold-open devices for swing doors. Requirements and test methods.
UNE-EN 1158:2003	Building hardware. Door coordinator devices. Requirements and test methods.
UNE-EN 124-1:2015	Covering and closing devices for traffic areas used by pedestrians and vehicles. Part 1: Definitions, classification, general principles of design, performance requirements and test methods.
UNE-EN 124-2:2015	Covering and closing devices for traffic areas used by pedestrians and vehicles. Part 2: Smelting and closing devices.
UNE-EN 124-3:2015	Covering and closing devices for traffic areas used by pedestrians and vehicles. Part 3: Steel or aluminium alloy covering and closing devices.
UNE-EN 124-4:2015	Covering and closing devices for traffic areas used by



DOCUMENT	TITLE
	pedestrians and vehicles. Part 4: Reinforced concrete covering and closing devices.
UNE-EN 124-5:2015	Covering and closing devices for traffic areas used by pedestrians and vehicles. Part 5: Devices for covering and closing composite materials.
UNE-EN 124-6:2015	Covering and closing devices for traffic areas used by pedestrians and vehicles. Part 6: Coating and closing devices of polypropylene (PP), polyethylene (PE) or non-plasticised poly(vinyl chloride) (PVC-U).
UNE-EN 15619:2014	Rubber or plastic coated fabrics. Safety of temporary structures (tents). Specification for coated fabrics intended for tents and related structures.
UNE-EN 13501-1:2019	Fire classification of construction products and building elements. Part 1: Classification from data obtained in reaction to fire tests.
UNE-EN 14115:2002	Textiles. Burning behaviour of materials for marquees, large tents and related products. Ease of ignition.
UNE-EN 16750:2018	Firefighting systems. Oxygen-reduction systems. Design, installation, planning and maintenance.

Note: In the case of standards referred to in the Official Journal of the European Union for the application of harmonised product legislation according to European regulations or directives, such standards (reference and version) shall take precedence over those indicated in this table.