

Passive fire protection

Fire protection is a determining factor in the construction or standardization of a building.

Installing active protection (sprinklers, extinguishers, etc.) is necessary but not sufficient.

As a building professional, you must comply with building safety standards.

The safety regulations are intended to:

- Prevent the formation, development and spread of fire
- Limit the fire's spread
- Ensure the stability of structural elements in case of fire

- Prevent the fire from spreading to neighbouring buildings
- Ensure that occupants are safe and can evacuate
- Facilitate firefighters' intervention
- Reduce operating losses

The primary aim is to enable occupants to evacuate under the best possible conditions. Some catastrophes can also cause irremediable damage to a building, causing a complete stoppage of its activities. Passive protection works due to its mere presence, without human intervention or energy requirements, and requires no maintenance.

Reaction to fire

Reaction to fire is a factor related to the material's intrinsic properties. It includes all of a material's characteristics in relation to its influence on the formation and spread of fire. In accordance with amended Decree of 21 November 2002, the Euroclasses (the classification system for reaction of materials to fire) are determined using new testing methods that are harmonized on the European level. The adjacent table presents the equivalencies between the Euroclasses (A1 to D) and the old fire reaction classes (M0 to M4).



SBI – Fire reaction test

Euroclasses of construction products other than floors (NF EN 13 501-1)			Regulatory requirements
A1	-	-	Non-combustible
A2	s1	d0	M0
A2	s1	d1	M1 Combustible, non-flammable
A2	s2	d0	
	s3	d1	
B	s1	d0 d1	
	s2		
	s3		
C	s1	d0 d1	M2 Combustible, low flammability
	s2		
	s3		
D	s1	d0 d1	M3 Combustible, medium flammability
	s2		M4 Combustible, high flammability
	s3		

The Euroclasses include additional classifications:

S(1,2,3) for smoke production, d(0,1,2) for the falling of burning droplets and debris.

Fire resistance

Fire resistance, just like acoustic and thermal insulation, is a key parameter to take into consideration when designing a building. The methods for testing fire resistance and the resulting classifications are defined in the Decree of 22 March 2004 (which supersedes the Decree of 3 August 1999). Three criteria are used to assess the different fire resistance levels of buildings tested.

Mechanical Resistance (European classification «R»)

For horizontal structural elements, this criterion is deemed satisfactory if the warping caused does not exceed 1/30th of the range or if the warping speed does not exceed 3mm/min per metre of range. For vertical structural elements, this criterion is satisfactory if the collapse speed does not exceed 3mm/min per metre of height or if the collapse does not exceed 1/100th of the height.

Resistance against flames and hot, flammable gases (European classification «E»)

This criterion is no longer met when the following is observed:

- The inflammation of a layer of cotton wool placed near the sample
- Penetration to a defined opening size
- The spread or sustained production of flames on the non-exposed side

Thermal insulation (European classification «I»)

This criterion is met when the temperature of the surface not exposed to fire does not exceed an average of 140°C or 180°C at any given spot.