

The fire stability of reinforced-concrete structures and supports is ensured by limiting temperature increases in the steel and framework enclosed in the concrete.

Forecasting methods to calculate the behaviour of concrete structures in the presence of fire are described in Eurocode NF EN 1992-1-2. They specify that concrete structural elements are fire resistant for 2 hours when their minimum thickness is 12cm and the coating on the steel is 4cm thick.

In nearly all buildings, the coating is normally 2 cm. It is for this reason that concrete elements require fire protection that compensates for this difference in thickness.

Ribbed slabs

The undersides of concrete floors are protected in exactly the same way as other structural elements, with the same fire-resistant products.

Floor slabs

The undersides of concrete or ceramic floor slabs with a grooved underside are protected in the same way as other structural elements with the same protective products.

For a ceramic floor slab protected with FIBROFEU®, a sheet of expanded metal is required.

Projiso offers multiple concrete structure fire protection solutions Fibrous coatings made from mineral wool (FIBREXPAN®, FIBROFEU®).

A product is selected depending on various factors specific to the construction site.

Excerpt from NF EN 1992-1-2

Filled slabs

Duration of resistance to fire	60 min	90 min	120 min	180 min	240 min
Slab thickness (mm)	80	100	120	150	175
Steel coating (mm)	20	30	40	55	65

Rectangular beams (beams on single supports)

Duration of resistance to fire	60 min	90 min	120 min	180 min	240 min
Beam thickness (mm)	120	150	200	240	280
Steel coating (mm)	40	55	65	80	90

Rectangular beams (continuous beams)

Duration of resistance to fire	60 min	90 min	120 min	180 min	240 min
Beam thickness (mm)	120	150	200	240	280
Steel coating (mm)	25	35	45	60	75

Load-bearing walls (exposed on one side)

Duration of resistance to fire	60 min	90 min	120 min	180 min	240 min
Wall thickness (mm)	130	140	160	210	270
Steel coating (mm)	10	25	35	50	60

The above tables specify the minimum thicknesses of structures and steel coatings to ensure that they have the required resistance to fire.

When the thicknesses of concrete structures are insufficient to achieve the desired fire resistance, the application of a spray-on product can be used to supply the missing thickness.