

PROJISO

Spray-on insulation materials



www.projiso.fr - contact@projiso.fr



Responsability

Expertise

Innovation

Projiso, leader in the manufacture and marketing of spray-on fibrous and plaster coatings, offers a wide range of products with multiple performance options: fire resistance, thermal insulation, acoustic correction and attenuation.

Used in HQE buildings, PROJISO is quality certified to ISO 9001 and environmentally certified to ISO 14001.

Research & Development and innovation play a central role in Projiso's strategy, driving a continuous offer of new systems and additions to its product ranges.

Projiso is dedicated to ensuring the safety of people and property through the use of its fire protection products. Our thermal insulation with no thermal bridging and enhanced acoustic characteristics also provides extra comfort.

Faithful to its strategic directions and mindful of the installation conditions at its approved applicator partners, Projiso pays particular attention to regulatory and environmental issues. All our products bear CE marking and are accompanied by FDES (Environmental and Health Declaration Datasheet) and FDS (Safety Data Sheet).

Through the know-how and expertise of its partners, Projiso participates in numerous projects both in France and worldwide.

Projiso seeks to maintain a close relationship with construction industry stakeholders; Projiso, manufacturer of spray-applied coatings dedicated to players in the spray-applied materials sector.

Pierre GORCHS
Sales Director

Content

i

General information on insulation solutions

i

General information on fire protection solutions

Fibrexpand® Technical Datasheet and Applications

Fibrofeu® Technical Datasheet and Applications

Firespray® Technical Datasheet and Applications

Fireplaster® Technical Datasheet and Applications

**Primers and finishes - Technical Datasheets
Site Datasheet**

GENERAL INFORMATION
ON INSULATION
SOLUTIONS

GENERAL INFORMATION
ON FIRE PROTECTION

FIBREXPAN®
ACOUSTIC THERMAL INSULATION -
FIRE PROTECTION OF CONCRETE
STRUCTURES

FIBROFEU®
CONVENTIONAL FIRE AND
ACOUSTICS INSULATION

FIRESPRAY®
FIRE INSULATION - ROOFING -
SHEET METAL DUCTS - COMPOSITE
FLOORS - WOOD FLOORS -
HOLLOW FLOOR SLABS

FIREPLASTER®
FIRE INSULATION - CONCRETE,
STEEL - STRUCTURAL FLOOR TRAY
CLADDING

ACCESSORIES
PRIMERS - FINISHES

General information on insulation solutions

i

Passive fire protection

Thermal insulation

Acoustic correction and attenuation

Choosing and implementing fire, thermal and acoustic protection systems

Passive fire protection

Fire protection is a key factor in building construction or retrofitting. While the installation of active fire protection systems (sprinklers, extinguishers, etc.) is necessary, it is not sufficient. As a construction professional, you are required to comply with building safety standards.

Safety regulations are intended to:

- Prevent the origin, development and spread of fire
- Limit the spread of fire
- Ensure the stability of structural elements in the event of fire

- Avoid fire spreading to neighbouring buildings
- Ensure the safety of occupants and their evacuation
- Facilitate intervention by the fire brigade
- Reduce operating losses

The primary aim is to evacuate building occupants under the best possible conditions. Some fires may also cause irreparable damage to a building, resulting in a total cessation of business. Passive fire protection acts as such by its very presence, with no need for human intervention, power input or maintenance.

Reaction to fire

Reaction to fire is a criterion relating to a material's intrinsic property. It is the sum of all the properties of a given material in relation to their effect on the origin and propagation of a fire. According to the amended decree of 21st November 2002, Euroclasses (the European reaction to fire classification system) are determined by new European harmonised fire tests. The table opposite presents the equivalence between Euroclasses (A1 to D) and the former reaction to fire classes (M0 to M4).



SBI - reaction to fire test

Euroclasses for construction products other than floors (NF EN 13 501-1)			Regulatory requirements
A1	-	-	Non-combustible
A2	s1	d0	M0
A2	s1	d1	M1 Non-flammable combustible materials
	s2	d0	
	s3	d1	
B	s1	d0	
	s2	d1	
	s3		
C	s1	d0	M2 Flammable materials with low flammability
	s2	d1	
	s3		
D	s1	d0	M3 Medium flammable combustible materials
	s2	d1	M4 Combustible materials Highly flammable
	s3		

Euroclasses provide for additional classifications: s (1,2,3) for smoke production, d (0,1,2) for falling flaming drops and debris.

Fire resistance

Like acoustic and thermal insulation, fire resistance is an essential parameter that has to be factored in at a building's design stage. Fire resistance test methods and the resulting classifications are detailed in the order of 22nd March 2004 (replacing the order of 3rd August 1999). Three criteria are used to assess the fire resistance ratings of the tested structures.

Mechanical strength (European «R» rating)

For horizontal structural members, this criterion is satisfied if the resulting deflection does not exceed 1/30th of the span or if the rate of deformation does not exceed 3 mm/min per metre of span. For vertical structural members, this criterion is satisfied if the rate of collapse does not exceed 3 mm/min per metre of height or if the collapse does not exceed 1/100th of the height.

Flameproofing and tightness against hot and flammable gases (European classification «E»)

This criterion is no longer satisfied if there is observable:

- Ignition of a layer of cotton wool placed in close proximity to the sample
- Penetration of a defined opening size
- Passage or sustained production of flames on the unexposed side

Thermal insulation (European classification «I»)

This criterion is satisfied when the temperature rise of the surface not exposed to fire does not exceed 140°C on average or 180°C at any given point.

Regulatory texts

Regulatory texts classify buildings according to the risks inherent to each building type (height, number of employees, activity, etc.), and specify the fire protection requirements for each type of building. The regulatory texts are the only valid reference documents and must be read in their entirety.

Buildings are classified according to the following categories:

Public buildings (E.R.P.): order of 25th June 1980, amended
High-rise buildings (I.G.H.): order of 18th October 1977, amended
Residential buildings: order of 31st January 1986, amended
Classified installations ICPE: Law of 19th July 1996 and standard orders for facilities subject to reporting
Workplace: French Labour Code and order of 05th August 1992, amended

Classification of buildings

Public buildings (E.R.P.)

E.R.P. are classified in five categories and types. Building type depends on the nature of the business operation. Building categories are based on the numbers of public and staff that frequent them.

- 1 : over 1500 people
- 2 : 701 to 1500 people
- 3 : 301 to 700 people
- 4 : 300 people or less, excluding category 5 buildings
- 5 : buildings covered by Article R 123-14 in which the number of members of the public does not reach the figure set by the safety regulations for each type of business operation.

The following classification only applies to category 1 to 4 buildings.

High-rise buildings and skyscrapers (I.G.H. and I.T.G.H.)

An I.G.H. is a building with height over 50 m for residential buildings, or over 28 m for other types of building.

An I.T.G.H. is a building with height over 200 m.

The order of 18th January 2021, amended (replacing the order of 18th October 1977) contains general measures common to all building classes, together with specific provisions for the various building classes.

The various classes are defined as follows:

GHA: residential buildings **GHO: hotel buildings**
GHR: education buildings
GHS: archive deposit buildings
GHU: sanitary buildings
GHW1: office buildings: 28 m PBDN* ≤ 50 m
GHW2: office buildings: PBDN* > 50 m
GHZ: mixed use or containing a public building (E.R.P.).

**PBDN: Floor level of top floor*



Establishments within a building

- J:** Care facilities for the elderly and persons with disabilities
- L:** Auditoriums, conference rooms, meeting rooms, performance spaces or multiple-use rooms
- M:** Stores, shopping centres
- N:** Restaurants, public houses
- O:** Hotels, guest houses
- P:** Dance rooms, games rooms
- R:** Educational establishments, holiday camps
- S:** Libraries, documentation centres
- T:** Exhibition rooms
- U:** Health centres
- V:** Places of worship
- W:** Administrative buildings, banks, offices
- X:** Covered sports halls
- Y:** Museums

Special establishments

- EF:** Floating establishments
- GA:** Stations
- OA:** High-altitude hotels/restaurants
- PA:** Open-air establishments
- PS:** Covered car parks
- SG:** Inflatable structures
- CTS:** Marquees and tents
- REF:** Mountain refuges

Importance of thermal insulation

Importance of thermal insulation

Thermal insulation refers to all materials and techniques used to limit heat transfer between a cold and a warm environment. It is used in the textile, automotive and industrial sectors and, of course, in the construction industry, mainly to maintain a comfortable temperature inside the premises.

A building insulation project requires careful planning and consideration. It is not enough to simply install several insulating layers. Building insulation must be approached in a global way, paying particular attention to thermal bridges. Even where high performance products are used, the existence of unprotected or less protected areas in a building's thermal envelope would create thermal bridges resulting in high heat loss, damp spots and higher primary energy consumption.

Therefore, a building's elements need to be surrounded by a continuous thermal insulation envelope.

The benefits of this approach include:

- Reduced primary energy consumption and maintenance costs.
- A reduction in greenhouse gases generated by the combustion of fossil fuels and, therefore, a lower impact on global warming and climate change.
- Elimination of thermal bridges, thereby reducing the risk of condensation.
- A reduction in random heat losses and gains, which has a significant impact on the comfort and stability of the indoor environment all year round

Controlling heat loss

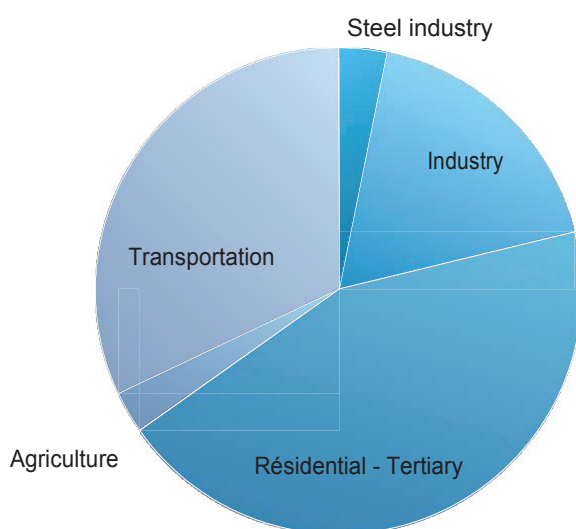
The heat passing through a wall is measured by the surface transmission coefficient U , which is expressed as the amount of energy in Watt per square metre for each degree of difference between the interior and exterior of a building ($W/m^2.K$).

This coefficient U depends on the thermal resistance R (in $m^2.K/W$) of each layer of the wall, as well as on the configuration of the whole, which can generate thermal bridges (beams or columns with different insulation levels, pipes running through the wall, etc.).

Energy in France in figures

PRIMARY ENERGY CONSUMPTION

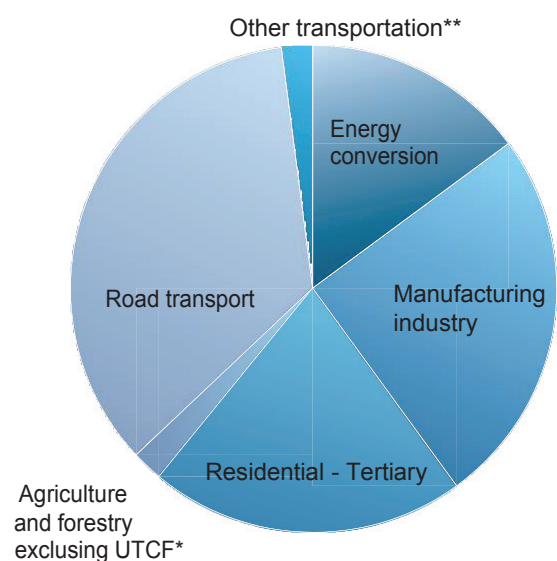
Breakdown by sector of final primary energy consumption in mainland France



Source: SOeS calculation, based on available data for each energy

CO₂ EMISSIONS

Breakdown by sector of atmospheric CO₂ emissions in mainland France (estimate)



* UTCF : Land use, land change and the forest.

** Other transport: as defined by the United Nations Framework Convention on Climate Change
Source: Citepa/Coralie format Secten, April 2012

2020 environmental regulations

RE 2020

Environmental regulations aim to encourage construction professionals to design buildings that minimise primary energy consumption, in order to reduce greenhouse gas consumption and contribute to French energy independence.

The main objective of RE 2020 is to achieve a primary energy consumption in buildings of less than 6.5 kWh/m²/year on average.

This aim correlates with three other aims:

- Adjustment of consumption requirements according to buildings' greenhouse gas emissions,
- Adjustment of the technical criteria requirement (geographic location, building characteristics and uses),
- The additional definition of an ambitious threshold of maximum heating energy requirements for buildings, in order to ensure high-quality design of building energy systems.

Bioclimatic requirement: "Bbiomax"

This requirement limits the energy needed for heating, cooling and lighting a building, which implies the design of buildings with good thermal insulation. The «Bbiomax» criterion is determined according to the geographic area, the altitude and the surface area of the building in question.

Maximum consumption requirement: "Cmax"

The «Cmax» coefficient requires a limit on a building's primary energy consumption. Five criteria are taken into account to calculate this coefficient: heating, domestic hot water production, cooling, lighting and auxiliaries (fans, pumps).

Limits can be adjusted according to building type (single family, collective, tertiary, etc.) and the geographic area in which it is located.

Summer comfort in buildings

RE 2020 makes one important change in relation to summer comfort. The TIC (Conventional Indoor Temperature), a regulatory indicator of RT 2012, is replaced by a new indicator: DH for «Degree Hour».

Life Cycle Assessment «LCA»

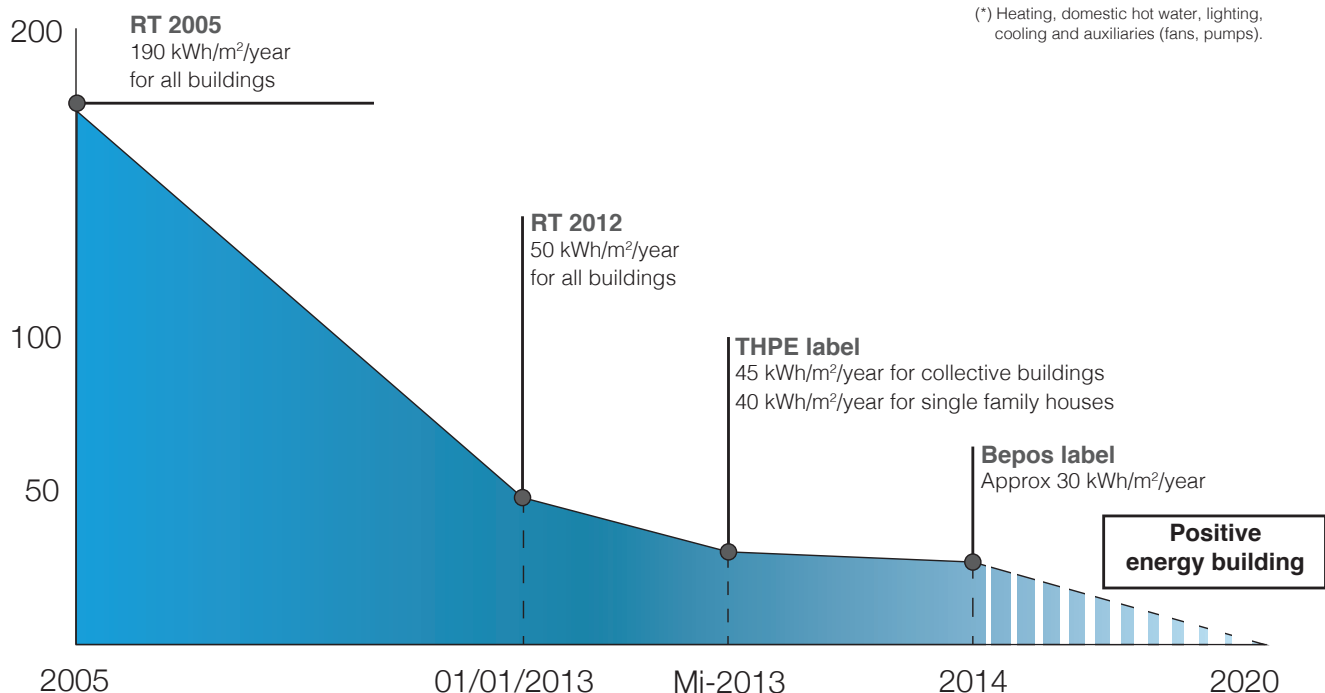
The carbon footprint of each new building is now calculated using a life cycle assessment (LCA). This analysis takes into account all the greenhouse gases emitted throughout the building's lifetime, from «cradle to grave», via the construction and operating phases, over a reference period of fifty years. The calculation factors in the contribution to the environmental impact of the five categories making up the building: emissions relating to the components, imported energy, the construction phase, water consumption and the plot.

Treatment of thermal bridges

RE 2020 recommends optimising the treatment of thermal bridges and air tightness (for which the «blower door» test is now mandatory in collective buildings). These two criteria ensure high-quality system design that considerably reduces primary energy consumption.

The RE 2020 environmental regulation sets threshold values for thermal bridges in new builds.

Changes in maximum consumption thresholds for the five regulatory categories*



CSTB report on the performance of Fibrexpan®

Several industry players have joined forces to carry out a study led by the CSTB which compares the thermal performance of spray-on insulation and rock wool panels.

The study's findings indicate that the metal joints and fastenings of conventional insulation panels generate thermal bridges. Yet another thermal bridge is created by load-bearing structures, which are often impossible to insulate with this type of system.

Conversely, spray-on insulation materials can cover the entire surface to be insulated, thus creating continuous coverage, and limiting thermal bridges.

Therefore, even if an insulation panel has a better lambda value (thermal conductivity) than spray-on insulation, due to installation constraints, the insulation panel may not perform as well in terms of post-installation heat loss.

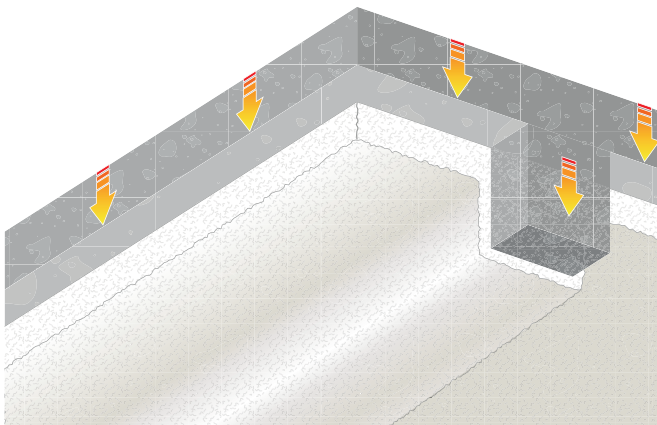
The study DER/HTO2010-336-AD/LS, carried out by the CSTB, comparing these two types of insulation confirms this reasoning.

Among other things, the study report states that the heat loss of the system with spray-on insulation coating is up to 34% lower than that of a system insulated using rock wool panels.

The study DEIS/HTO-2018-019-BB/LB, carried out by the CSTB at Projiso's request, again comparing these two types of insulation, specifies that Fibrexpan® shows better performance in terms of μ p compared to installed insulation panels (see report conclusion p.20).

These conclusive results are mainly due to «the absence of integrated thermal bridges and, above all, to the fact that it is possible to insulate beams (by spray coating

Thermal insulation on the underside of a concrete wall using Fibrexpan®

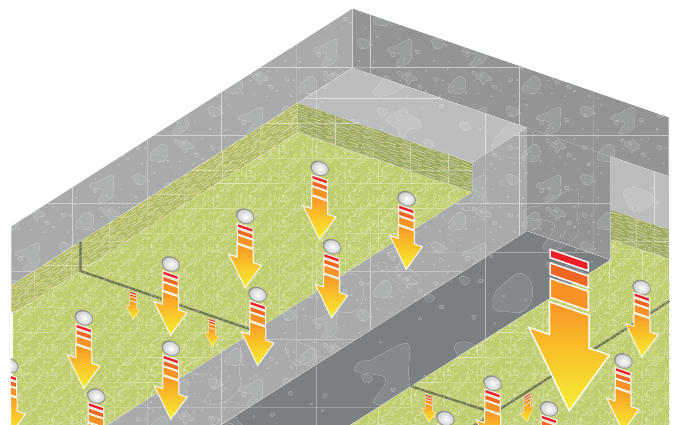


$$\lambda = 0,038$$

- > Continuity of thermal insulation
- > Insulation of beams

**Heat loss from the system:
0,44 to 0,46 W/m².K**

Thermal insulation on the underside of a concrete wall using rock wool panels



$$\lambda = 0,038$$

- > Joints between panels
- > Fastenings passing through the insulation
- > Difficulty of insulating beams

**Heat loss from the system:
0,64 to 0,70 W/m².K**

These assumptions demonstrate that the thermal losses of a system insulated with FIBREXPAN® are up to 34% lower than those of a system insulated with rock wool panels.

Metal fastenings and joints between panels create built-in thermal bridges.

Conclusion of the CSTB report:

“For insulation with identical thermal performance, the spray-on slag wool insulation technique gives a better result due to the absence of integrated thermal bridges and the ability to insulate beams.”

CSTB report: DER/HTO2010-336-AD/LS

A subsequent CSTB report, again for insulation with identical thermal performance, shows that the spray-on slag wool insulation technique is at least 15% more efficient in wall μ in relation to installed insulation panels, depending on their configuration (see report, pages 19 and 20).

CSTB report: DEIS/HTO2018-019-BB/LB

Importance of acoustic control

Noise, or unwanted sound, can be a nuisance or, if excessive and prolonged, can disturb concentration, make speech indistinct or, worse, damage hearing. People's health, safety and productivity will suffer as a result. Background noise control is therefore everyone's concern.

Noise control

In a building, people experience noise in two ways:

- As reverberations (or echoes) when the sources of the sound are in the same space (we will discuss absorption or acoustic correction measurements).
- As airborne or impact noise when the sources of the sound are in adjacent spaces (we will discuss sound insulation or sound attenuation).

Acoustic correction

Sound absorption refers to the attenuation (or absorption/correction) of reverberated noise in the same space as the sound source. The usual approach is to cover all or part of this space with a sound-absorbing material.

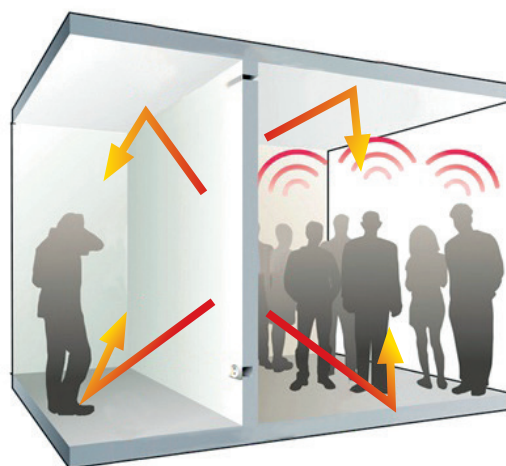
The energy of a sound wave will be partially reflected and partially absorbed when it encounters an object. The efficiency with which a material absorbs sound is measured based on its sound absorption coefficient, defined as the ratio of absorbed sound energy to the total sound energy available at the surface.

For example, a material that absorbs 75% of the sound energy of a particular frequency that meets its surface has a sound absorption coefficient of $\alpha_s 0.75$ for this frequency. The sound absorption coefficient will vary according to the different frequencies.

Two methods are used to characterise the absorption properties of a given material over the entire audible frequency range:

- The noise reduction coefficient (NRC) is the average of the sound absorption coefficients measured in the frequency range 250 to 2000 Hertz.
- The weighted sound absorption coefficient α_w also takes

account of how the human ear perceives the sound, and is supplemented by a shape index which indicates when the product is especially good at absorbing low (L-index), medium (M-index) or high frequencies (H).



Acoustic attenuation

An increase in sound absorption in a given space does not mean a corresponding increase in acoustic attenuation between spaces, although there is some benefit. There is no direct relationship between correction and attenuation. This property therefore has to be assessed directly.

The acoustic reduction of airborne noise by a wall is measured according to NF EN ISO 140-3, noting for each frequency the difference in intensity between the sound emitted and the sound measured on the other side of the wall. This produces a curve that shows the attenuation R as a function of frequency.

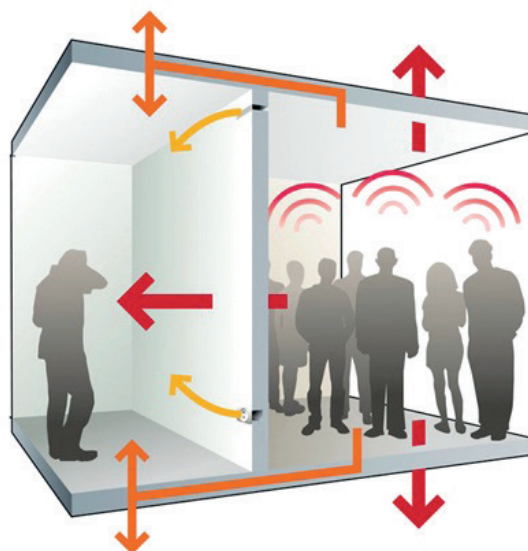
This curve is used to determine the single weighted index R_w (C; Ctr), in dB.

The adaptation terms C and Ctr are used to calculate:

- Reduction of noise from neighbours, industrial activities or airports:
 $RA = R_w + C$ in dB
- Reduction of noise from ground transport infrastructure:
 $RA_{tr} = R_w + C_{tr}$ in dB.

It is important to note, however, that according to NF EN ISO 140-3: 1995, «The results of measurements [...] should not

be applied directly in situ, without taking into account other factors that affect sound insulation, including lateral transmission and the loss factor.»



Transmission du bruit : → directe / → indirecte ou latérale / → parasite

Selecting a suitable fire protection, thermal or acoustic insulation system

For an application such as a concrete or steel structure, the specifier will have to consider certain questions when selecting the product to be sprayed.

1. What is the required performance (fire resistance, acoustic correction, thermal insulation)?
2. Is the product likely to suffer physical damage?
3. Does weight matter?
4. Is price the main selection criterion?
5. Is speed of implementation important?
6. Is access difficult?
7. Are there any interactions with other trades?
8. Does the product have to be used in an air circulation plenum?
9. Is the product easy to repair?
10. Does the appearance and type of finish matter?

This list of questions makes it possible to prescribe a product in full knowledge of the facts while avoiding contractual issues that could supplement an imprecise specification based solely on a performance rating, i.e. a thermal resistance value. All specifiers should initially consider points 1 to 3, and then 5 to 10.

Point 4 (price) should only be considered once the type of product that best meets the customer's needs has been identified.

Tips and recommendations for the use of spraying machines

Fibrous products

Spraying is carried out using a hydro-pneumatic spraying machine.

The machine generally comprises:

- A feed hopper
- A carding device
- A blowing device (fan, turbine or booster)
- A hose to convey the spray mixture
- A spray gun for the spray mixture and water.

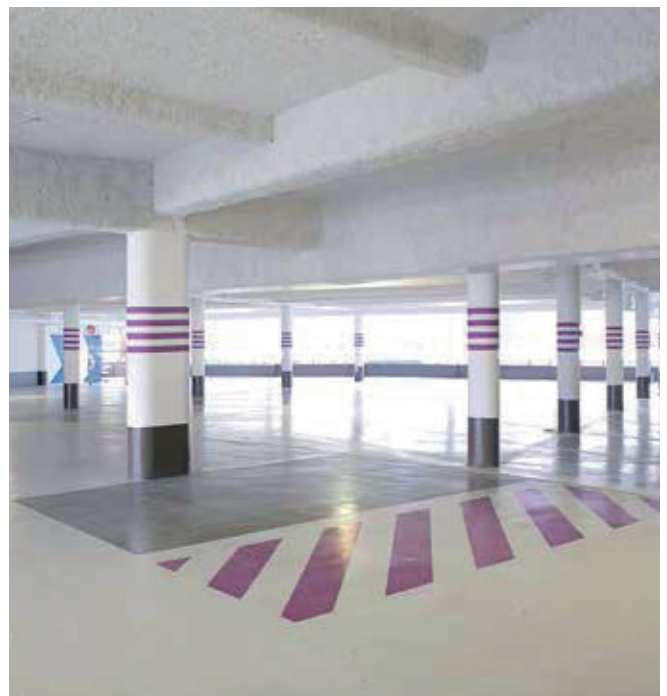
Mortar products

Spraying is done with a pump/mixer.

The machine generally comprises:

- A feed hopper
- A mixing chamber
- A pump (important depending on the product to be passed)
- A hose to convey the spray mixture
- A spray gun for the mixture to be sprayed.

The qualified spray technician sets the flow rates according to the manufacturer's technical specifications.



Tips and recommendations for the use and application of sprayed products

Fibrous coatings

This is a mixture of mineral wool and binder. The product is carded in a machine and then piped through a hose to a spray-gun using compressed air. Water-fed nozzles are placed around the hose outlet to wet the product before it is sprayed onto the substrate. The application of fibrous products is detailed in DTU 27.1.

Mortar

A mortar is a rendering in powder form. The product is sprayed with a pump through a hose and spray-gun mixed with air. The application of mortars is detailed in DTU 27.2.

Application of fibrous and plaster coatings

Spray-application of the products must be carried out in accordance with the following conditions:

The work must be carried out by trained personnel; this is ensured by the company's qualification.

The premises must be roofed and ventilated. The temperature of the room and the substrate must be between + 5 °C and + 45 °C.

Masonry and concrete substrates must be dry (drying time greater than or equal to 45 days for new substrates).

If stated in the specific contract documents (DPM), metal structures must have been treated with the anti-corrosion protection defined in said documents.

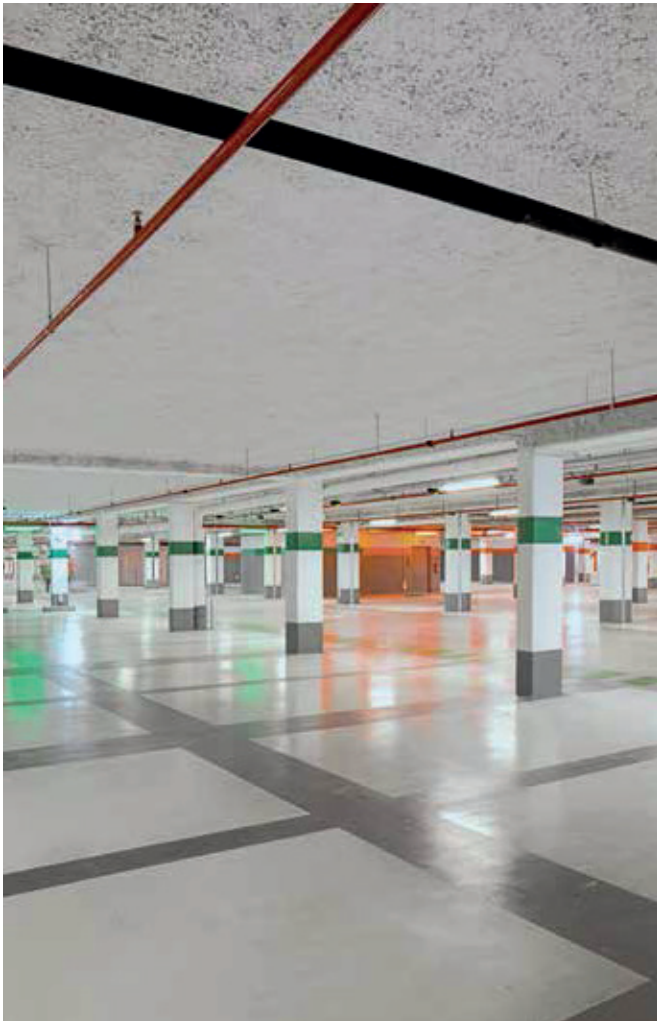
For fire protection applications, please refer to the classification or characterisation report.

The structural fastening devices to be implemented after spraying must be in place and the hoppers re-covered before spraying in order to restore substrate continuity.

The building must not be subjected to impacts or vibrations during the work or during the period required for the product to acquire its mechanical characteristics. This period depends on the nature of the product and on the prevailing temperature and humidity.

It is important to ensure that the recommended primers are applied in strict accordance with requirements. If in doubt, please contact our technical department.

NB: The qualification for the work in question is 7142 (Thermal insulation – spray-on acoustic correction - injection) or 7143 (passive fire safety).



General information on fire protection

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Fire protection of concrete structures

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Fire protection of steel structures

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**Fire protection of concrete floors with
structural steel floor trays**

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**Fire protection of ventilation and
smoke extraction ducts**

The fire stability of reinforced concrete structures and supports is achieved by limiting the temperature rise of the steel and reinforcement frameworks embedded in the concrete.

Forecasting methods used to calculate fire behaviour of concrete structures 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 12 cm and the coating on the steel is 4 cm thick.

In almost all buildings, the standard coating thickness is 2 cm. This is why concrete elements need fire protection to compensate for this difference in coating thickness.

Ribbed slabs

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

Floor slabs

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

Projiso offers a range of fire protection solutions for the underside of concrete structures

Mineral wool-based fibrous coatings (FIBREXPAN®, FIBROFEU®, FIRESPRAY®) and plaster based mortar (FIREPLASTER®) and vermiculite.

The product is chosen according to the various issues specific to the site.

Extract from NF EN 1992-1-2

Solid slabs

Fire resistance time	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)

Fire resistance time	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)

Fire resistance time	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 only)

Fire resistance time	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 dimensions of structure thicknesses and steel coatings to ensure that the elements have the required fire resistance.

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

Critical temperature

Temperature rises have a significant impact on the mechanical properties of steel.

At 400°C, the yield strength of steel is reduced to 60% of its original value. It has been proven that a steel structure subjected to heat will lose its load-bearing capacity after a certain time and collapse. The temperature at which this occurs is called the critical temperature.

This critical temperature will differ depending on the weight of the initial load and, in particular, on the degree of permissible stress and the nature of that stress.

For the purpose of simplification, the following minimum critical temperature values can be used, based on Euro-code 1993-1-2:

- 500 °C for compressed elements or elements subjected to axial bending and compression.

- 540 °C for isostatic beams and tension members.
- 570 °C for hyperstatic beams.

Section factor

The section factor S/V expresses the ratio between the surface area exposed to the heat flux S [m²] and the volume of an element per unit length V [m³]. Its value has a significant effect on the fire behaviour of a given structural element.

An element with a low S/V quotient [m⁻¹] will heat up much more slowly than an element with a high section factor. It will therefore have a higher fire resistance.

The following table gives the section factors for standard steel sections for beams exposed on 3 sides and columns exposed on 4 sides.

For other types, please contact Projiso's technical department.

Section factors of standard metal sections (in m⁻¹)

Steel beams exposed on 3 sides

	HEA	HEB	IPE	IPN	UAP
80	-	-	371	346	267
100	218	180	336	302	253
120	221	167	311	269	-
130	-	-	-	-	236
140	209	155	291	239	-
150	-	-	-	-	210
160	190	140	269	220	-
175	-	-	-	-	202
180	186	131	254	200	-
200	175	122	235	185	191
220	162	116	221	171	183
240	148	108	205	161	-
250	-	-	-	-	169
260	141	105	-	149	-
270	-	-	198	-	162
280	136	102	-	139	-
300	127	96	188	131	151
320	118	92	-	124	-
330	-	-	175	-	-
340	112	89	-	117	-
360	108	86	163	110	-
380	-	-	-	105	-
400	102	83	153	100	-
425	-	-	-	95	-
450	97	78	144	90	-
475	-	-	-	85	-
500	92	77	133	81	-
550	91	76	125	76	-
600	89	75	116	68	-

Steel columns exposed on 4 sides

	HEA	HEB	IPE	IPN	UAP
80	-	-	431	402	309
100	266	219	390	350	291
120	268	202	360	310	-
130	-	-	-	-	268
140	253	188	336	275	-
150	-	-	-	-	239
160	231	170	310	253	-
175	-	-	-	-	228
180	226	158	293	230	-
200	212	148	269	212	214
220	196	140	254	196	205
240	179	131	236	184	-
250	-	-	-	-	188
260	171	127	-	170	-
270	-	-	227	-	180
280	165	124	-	159	-
300	153	116	216	150	168
320	142	110	-	141	-
330	-	-	200	-	-
340	135	106	-	133	-
360	129	103	186	125	-
380	-	-	-	119	-
400	121	98	174	113	-
425	-	-	-	107	-
450	113	92	163	101	-
475	-	-	-	96	-
500	107	89	150	91	-
550	105	88	141	85	-
600	102	86	130	76	-

Operating principle

Coating a metal structure with a fibrous product will slow down the heating rate of the steel and therefore improve its fire behaviour.

The thickness of the coating to be applied will vary according to:

- The type of protective material
- The section factor of the section to be protected
- The critical temperature of the section to be protected

Coating proposed by Projiso

- Fibrous coating, FIBROFEU®
- Mortar, FIREPLASTER®

Application

- The substrate is untreated or rustproofed steel; although our products do not promote steel corrosion, a substrate treated with an alkyd or epoxy primer is recommended for long-term corrosion resistance. For other types of substrate, please contact Projiso's technical department.
- The substrate must be clean, dry, free of dust, rust, oil and any other contaminant that may interfere with good adhesion.
- The appropriate bonding primer must be applied before the application of the fire protection coating.

Examples of application thicknesses are given in the following pages.

The issues encountered in the fire protection of concrete floors with structural steel floor trays are not fundamentally different from those encountered in the protection of reinforced concrete floors.

As before, the aim is to limit the rise in temperature of the steel, which is visible here.

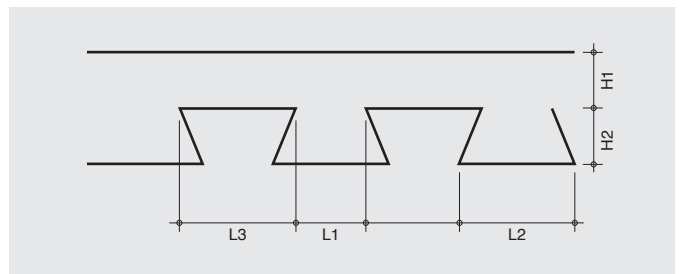
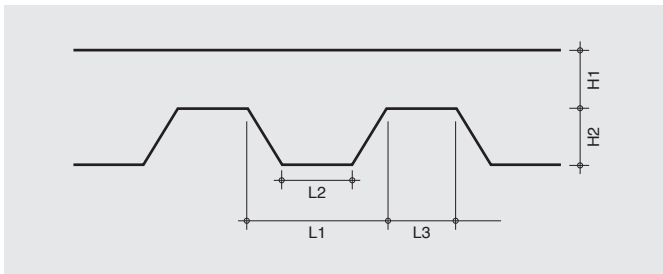
Projiso proposes two fire resistance solutions:

- Fibrous coating
- Mortar

Projiso's solution for the protection of composite slabs with structural steel floor trays can be used under the following conditions:

- Structural steel floor trays with a valid Technical Opinion
- Sheet thickness of the structural steel floor trays greater than or equal to 0.75 mm
- Width of the bottom of the corrugation (L2) of structural steel floor trays less than or equal to 187 mm
- Corrugation height (H2) of structural steel floor trays less than or equal to 87 mm
- Applies to any mixed slab with trapezoidal structural steel floor trays, with an effective thickness* greater than or equal to 73 mm
- Applies to all composite slabs with dovetailed structural steel floor trays, with an effective thickness* greater than or equal to 80 mm

$$* \text{Effective thickness} = H1 + \frac{H2 \times (L1 + L2) / 2}{L1 + L3}$$



Ventilation ducts

In the event of a fire, the ventilation ducts ensure the supply of fresh air and the pressurisation of neighbouring rooms. These ducts may pass through areas where the fire is active before reaching the protected areas. It is therefore vital to ensure that ventilation ducts meet the following properties whether the fire is outside the duct (normal operation) or inside (if the duct has been damaged):

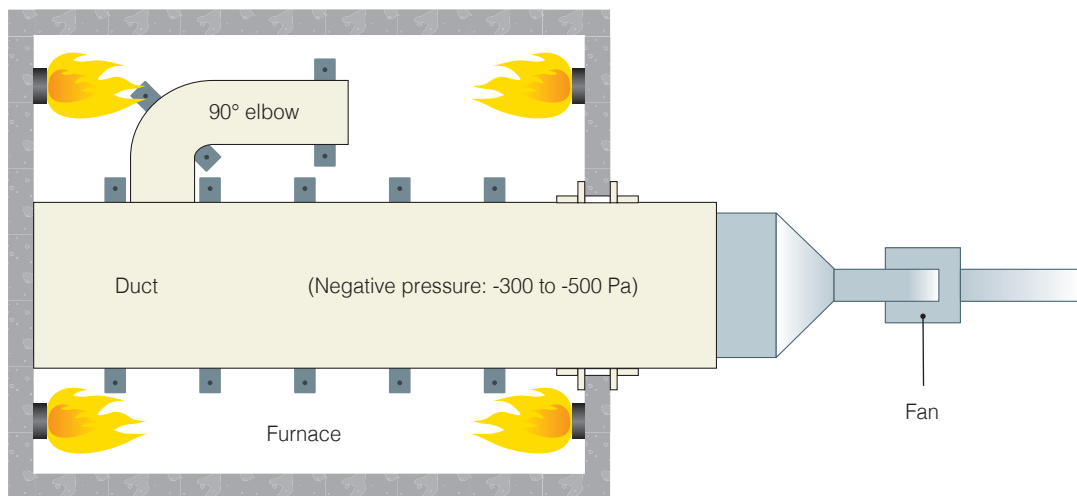
- Fireproofing, to prevent the fire spreading from one room to another
- Thermal insulation to limit the temperature rise.
- Limited deformation and mechanical strength of the duct and its support system to ensure it is able to perform its function for the intended duration.
- Smoketight (optional), to limit the spread of asphyxiating gases.

For this purpose, EN 1366-1 suggest two types of test:

- «Duct A» test: the fire is outside the duct, which is maintained at negative pressure. This test mainly measures the fire and smoke tightness of the duct, but also the thermal insulation, as well as its mechanical strength in the event of external fire.
- «Duct B» test: the fire is both outside and inside the duct where an air flow is provided by a fan; the temperature measurements are taken outside the furnace. This test is mainly used to measure the thermal insulation of the duct walls when the fire is inside, and also the duct's behaviour in «degraded» operation; moreover, the fan at the duct outlet is regularly stopped in order to simulate a breakdown.

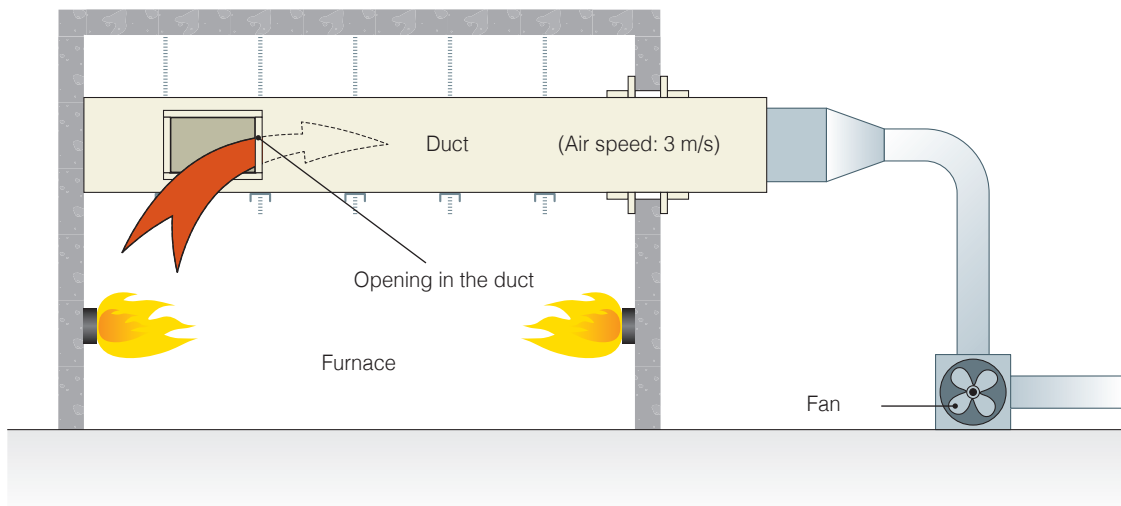
Duct A - Top view

Main aim: Measurement of tightness to flames and smoke, and also to hot, flammable gases in the event of an external fire.



Duct B - Side view

Main aim: Measurement of thermal insulation.



Smoke extraction ducts

The role of smoke extraction ducts is to extract hot, stale air, in order to limit the rise in temperature in the premises and facilitate the intervention of emergency teams. In addition to the properties of ventilation ducts, smoke extraction ducts must therefore meet the following properties:

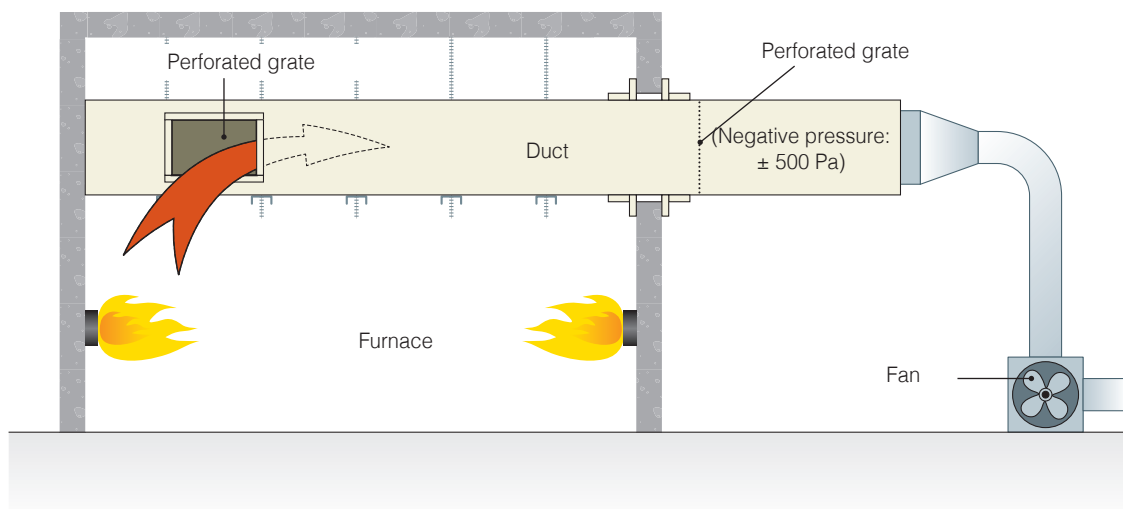
- Mechanical strength when the fire is inside and outside the duct.
- Tightness when the fire is only inside the duct and the duct is under negative pressure. This is necessary to ensure that the gases drawn in are the smoke and hot gases from the fire and not the clean ambient air that has filtered through the leaking duct.

To demonstrate this performance, the ducts are tested according to EN 1366-8 which requires that the ducts have been successfully tested:

- According to EN 1366-1 (A and B ducts)
- Using an additional «Duct C» test: the fire is outside and inside the duct. A fan extracts the hot air from the furnace and a perforated grate is placed between the section of duct in the furnace and the section outside; this creates a negative pressure in the exterior section of the duct. This test verifies the mechanical strength of the duct when subjected to fire inside and outside and also, using oxygen probes, checks that the air in the exterior section of the duct comes from the furnace area and not from outside through leaks in the duct.

Duct C

Main aim: Measurement of the duct's tightness and mechanical stability in the event of an internal fire.



Classification of duct fire resistance

Following these tests, the performance of the ventilation or smoke extraction ducts is expressed by the following classifications

- E: leaktight to flames and hot gases
- I: thermal insulation: temperature rise on the side not exposed to fire less than 140 °C on average and 180 °C at any given point
- S: Smoke-tightness, optional
- ho and/or ve: depending on the configuration in which the ducts were tested (horizontal or vertical)
- o → i, o ← i ou o ↔ i : only for ventilation ducts if they were tested with an external fire (duct A, classification o → i) or an internal fire (duct B, classification o ← i) or both (classification o ↔ i). The decree of 22nd March 2004, amended, requires that ventilation ducts used in buildings be validated by tests with external and internal fires. All ventilation ducts in FIRESPRAY® have obtained these two classifications and are therefore classified o ↔ i
- Multi: only for smoke extraction ducts, indicates that they can be used to extract smoke in multi-compartment areas
- Operating pressure: only for smoke extraction ducts, indicates the maximum permissible cold negative or overpressure.

Fibrexp[®]

Acoustic - thermal insulation

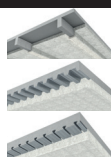
Fire protection of concrete structures



Technical datasheet - Fibrexp[®]



Thermal insulation using Fibrexp[®]



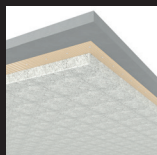
Thermal conductivity of Fibrexp[®]



Fire protection of concrete structures using Fibrexp[®]

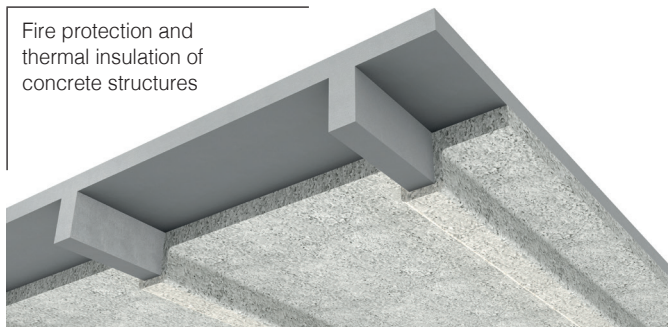


Acoustic Correction using Fibrexp[®]

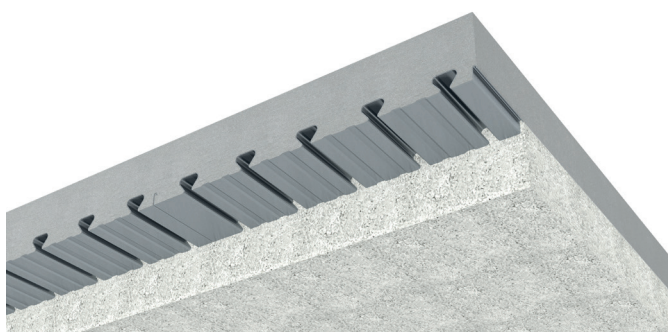
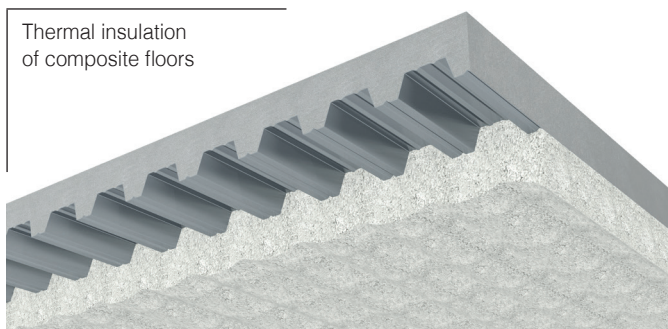


Acoustic Attenuation using Fibrexp[®]

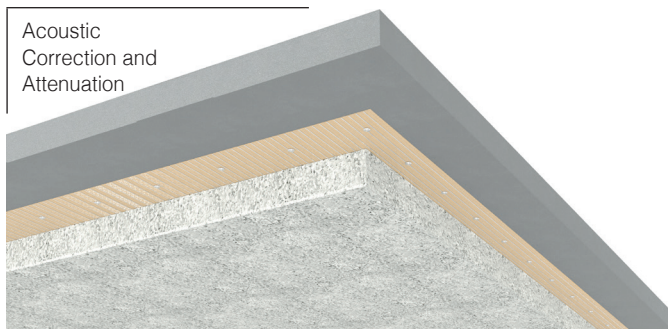
Fire protection and thermal insulation of concrete structures



Thermal insulation of composite floors



Acoustic Correction and Attenuation



Characteristics

Colour	Off-white
Appearance	Rolled or pressed
Density	150 kg/m³ ± 15 %
Reaction to fire	A1 - Report CSTB RH 08-0388 A
pH	9
Initial setting time	24 hours at 20 °C and 50 % HR
Setting mode	Hydraulic setting
use temperature	5 to 45 °C
Low biopersistence	As per directive CE 97/69
Therma conductivity	0,038 W/m.K (ACERMI certificate)
VOC rating	A+
Other	FDES - FDS - CE Marking

The information given in this technical document is based on current tests and is believed to be specific to the product. However, no guarantee of results is implied as conditions of use are beyond our control.

Application scope

Thermal insulation
Acoustic Attenuation
Acoustic Correction
Fire Protection



Description

Fibrexpan® is a spray-on coating for thermal insulation of surfaces not exposed to the weather. Fibrexpan® is a dry material comprising slag wool, hydraulic and semi-synthetic binders and various additives; it is presented as flakes.

Applications

- Concrete floors and structures (thermal insulation, fire protection, acoustic correction and attenuation)
- Concrete beam and slab floors (thermal insulation, fire protection, acoustic correction and attenuation)
- Concrete slabs with structural steel floor trays (thermal insulation and sound attenuation)

Properties and performance

- Rot-proof
- Non-combustible
- Ease of implementation

Implementation

Refer to the reference reports and implementation rules specified in DTU 27.1.

Bonding primers

PROJISO FIXO B® (concrete) - PROJISO FIXO M® (metal)
PROJISO FIXO M+® (concrete - metal)

Finish

PROJISO FIXO DUR®, SIDAIRLESS®

Environment and safety

Refer to the Environmental and Health Declaration Sheet (FDES) and the Safety Data Sheet (FDS), available on request. Do not discharge waste into drains, waterways or the ground. Use the bin bags provided for this purpose.

Packaging and storage

- Storage period: 12 months maximum from the date of manufacture in unopened packaging.
- Storage conditions: protect from frost, moisture, excessive heat and excessive radiant sunlight.
- Packaging: 20 kg plastic bag.
- Palletising: 30 bags per pallet i.e. 600 kg.

ACERMI

Fibrexpan® is ACERMI certified.

For certified conductivity and thermal resistance values, see following page.

ACERMI is the product of a dual commitment:

- That of the manufacturer who agrees to set up a quality system with the means necessary to monitor the quality of its products, and to ensure the system's long-term sustainability.
- That of the certifier, an independent, competent and recognised body, whose role is to guarantee the truthfulness of the announced characteristics and to re-evaluate them on a regular basis.

To find out more, visit the website www.acermi.com.

DTU 27.1 version 2019

ACERMI certification, which guarantees the thermal properties of the product when it leaves the factory, is supplemented by a Unified Technical Document (DTU 27.1).

DTU 27.1 is used to validate:

- Application of a Fibrexpan® coating up to 240 mm thick on a masonry or concrete substrate, with no intermediate reinforcement (except at altitudes above 900 m)
- Conditions of application of Fibrexpan® on a wide range of substrates, including insulation panels, plasterboard, wood floors...

- Precautions to be taken to ensure the spraying quality.

DTU 27.1 also sets out a self-checking method, which is essential to demonstrate that the ex-factory performance guaranteed by ACERMI certification is reproduced on site. The results of the self-checks are reported in the worksheet.

Site datasheet

The site datasheet is used to:

- Show the quantity of sprayed insulation,
- Ensure traceability from the bulk finished product, leaving the factory, to the finished product, applied on site (section 2 of the datasheet),
- Guarantee thermal performance according to an installed density and thickness per machine and per thickness.

The datasheet is produced in triplicate:

- One copy is kept by the spray application technician,
- One copy is kept by the principal,
- One copy is kept by the contracting authority.

These supporting documents must be kept for at least 10 years and according to the regulations in force.

A datasheet must be filled in for each machine and each spraying thickness (i.e. for each setting).



Thermal and fire protection solution using Fibrexpan® with Sidairless® finish.



Thermal and fire protection solution by Fibrexpan®, rough finish.

Thermal conductivity and resistance

Certified thermal conductivity: $\lambda = 0,038 \text{ W/m.K}$

Thickness of the applied Fibrexpan® (mm)	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240
R (m².K/W)	2,60	2,85	3,15	3,40	3,65	3,90	4,20	4,45	4,70	5,00	5,25	5,50	5,75	6,05	6,30

Thicknesses of Fibrexpan® to be used according to the thickness of the reinforced concrete slab and the required surface transmission coefficient U, taking into account the surface resistances, for a descending flow and a wall facing an unheated closed room.

(Rs = 0,21 m².K/W) :

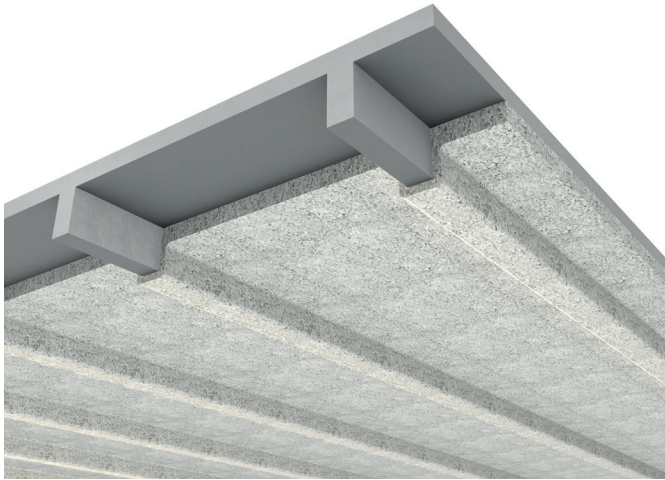
Reinforced concrete : $\lambda = 2 \text{ W/m.K}$

Fibrexpan® : $\lambda = 0,038 \text{ W/m.K}$

Slab thickness in mm	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240
Thermal resistance of the concrete slab in m2.K/W	0,050	0,055	0,060	0,065	0,070	0,075	0,080	0,085	0,090	0,095	0,100	0,105	0,110	0,115	0,120
Surface transmission coefficient U in W/m².K	0,17	215	215	215	215	215	215	215	215	215	215	215	215	215	215
	0,19	195	190	190	190	190	190	190	190	190	190	190	190	190	190
	0,21	175	175	175	170	170	170	170	170	170	170	170	170	170	170
	0,23	155	155	155	155	155	155	155	155	155	155	155	155	155	155
	0,25	145	145	145	145	145	140	140	140	140	140	140	140	140	140
	0,27	130	130	130	130	130	135	130	130	130	130	130	130	130	130
	0,29	120	120	120	120	120	120	120	120	120	120	120	120	120	120
	0,31	115	115	115	115	110	110	110	110	110	110	110	110	110	110
	0,33	105	105	105	105	105	105	105	105	105	105	105	105	105	105
	0,35	100	100	100	100	100	100	95	95	95	95	95	95	95	95
	0,37	95	95	90	90	90	90	90	90	90	90	90	90	90	90
	0,39	85	85	85	85	85	85	85	85	85	85	85	85	85	85
	0,41	80	80	80	80	80	80	80	80	80	80	80	80	80	80
	0,43	80	80	80	75	75	75	75	75	75	75	75	75	75	75
	0,45	75	75	75	75	75	75	75	70	70	70	70	70	70	70
	0,47	70	70	70	70	70	70	70	70	70	70	70	70	70	70
	0,49	65	65	65	65	65	65	65	65	65	65	65	65	65	65
	0,51	65	65	65	65	65	65	60	60	60	60	60	60	60	60
	0,53	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	0,55	60	60	60	60	55	55	55	55	55	55	55	55	55	55
	0,57	55	55	55	55	55	55	55	55	55	55	55	55	55	55
	0,59	55	55	55	55	50	50	50	50	50	50	50	50	50	50
	0,61	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	0,63	50	50	50	50	50	50	50	50	45	45	45	45	45	45
	0,65	45	45	45	45	45	45	45	45	45	45	45	45	45	45
	0,67	45	45	45	45	45	45	45	45	45	45	45	45	45	45
	0,69	45	45	45	45	45	45	40	40	40	40	40	40	40	40
	0,71	40	40	40	40	40	40	40	40	40	40	40	40	40	40
	0,73	40	40	40	40	40	40	40	40	40	40	40	40	40	40

Example: to obtain a surface transmission coefficient U = 0.31 W/m2.K, with a 180-mm thick slab, the Fibrexpan® needs to be sprayed to a thickness of 110 mm.

R/REI 60 to 240



Application scope

- Application on solid reinforced concrete elements
- Protection thickness for flat slabs between 44 and 215 mm
- Protection thickness for load-bearing walls between 44 and 80 mm
- Protection thickness for rectangular beams between 40 and 80 mm
- Application on unsurfaced concrete structures poured with mineral oil or emulsion form release agents
- Application on flat slabs, rectangular beams, walls exposed on one side only
- Thickness of flat slabs greater than or equal to 120 mm
- Thickness of load-bearing walls greater than or equal to 130 mm
- Width of rectangular beams greater than or equal to 150 mm
- Substrate treated with PROJISO FIXO B® bonding primer prior to application
- Can be finished with PROJISO FIXO DUR® or SIDAIRLESS®

Required thickness for the protection of reinforced concrete slabs designed according to EUROCODE EN 1992-1-2

Slab Thickness ≥ 120 mm Initial coating of any steel	Performance				
	REI 60	REI 90	REI 120	REI 180	REI 240
Minimum thickness of Fibrexpan® (in mm)	44	44	44	44	90

Required thickness for the protection of reinforced concrete beams designed according to EUROCODE EN 1992-1-2

Beam on single supports Width ≥ 150 mm	Performance				
	R 60	R 90	R 120	R 180	R 240
Initial coating (in mm) on steel	0 10 20 30	0 10 20 30	0 10 20 30	0 10 20 30	0 10 20 30
Thickness of Fibrexpan® (in mm)	40 40 40 40	40 40 40 40	40 40 40 40	50 45 40 40	65 55 50 45

Required thickness for the protection of reinforced concrete beams designed according to EUROCODE EN 1992-1-2

Continuous beam Width ≥ 150 mm	Performance				
	R 60	R 90	R 120	R 180	R 240
Initial coating (in mm) on steel	0 10 20 30	0 10 20 30	0 10 20 30	0 10 20 30	0 10 20 30
Thickness of Fibrexpan® (in mm)	40 40 40 40	40 40 40 40	40 40 40 40	40 40 40 40	55 50 50 50

Required thickness for the protection of reinforced concrete load-bearing walls designed according to EUROCODE EN 1992-1-2

Wall exposed on one side only Thickness 130 mm Initial coating of any steel	Performance		
	REI 60	REI 90	REI 120
Minimum thickness of Fibrexpan® (in mm)	44	44	44

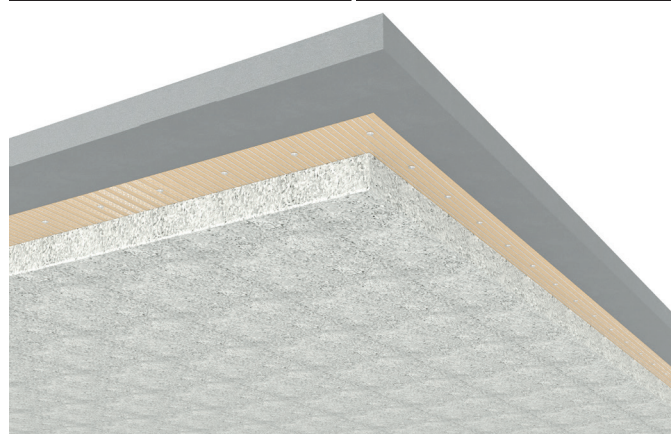
For any other type of implementation, please contact us.

Fibrexpan® - Study report: CSTB AC21-04753

Thickness of Fibrexpan®	Substrate	Frequency in hertz																		α w
		100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	
		Absorption coefficient α _s																		
40 mm	Solid	0,06	0,10	0,16	0,25	0,38	0,57	0,78	0,91	0,99	1,00	0,97	0,97	0,99	1,02	1,01	1,02	1,03	1,03	0,70 (MH)
50 mm	Solid	0,11	0,17	0,28	0,42	0,61	0,80	0,91	0,97	0,98	0,95	0,97	0,99	0,99	1,02	1,01	1,02	1,02	1,03	0,9
60 mm	Solid	0,17	0,27	0,42	0,60	0,78	0,89	0,96	0,97	0,94	0,96	0,98	1,00	1,01	1,00	1,02	1,02	1,03	1,03	1
70 mm	Solid	0,26	0,29	0,54	0,76	0,88	0,93	0,96	0,93	0,95	0,98	0,98	0,98	1,01	1,02	1,04	1,06	1,08	1,11	1
80 mm	Solid	0,35	0,50	0,70	0,83	0,94	0,97	0,93	0,92	0,96	0,99	0,99	0,98	1,00	1,01	1,02	1,02	1,03	1,03	1
90 mm	Solid	0,45	0,61	0,78	0,92	0,97	0,93	0,91	0,93	0,97	0,98	0,98	0,99	1,00	1,01	1,02	1,02	1,03	1,03	1
100 mm	Solid	0,54	0,70	0,82	0,91	0,94	0,90	0,91	0,95	0,98	0,97	0,98	0,99	1,00	1,01	1,02	1,02	1,03	1,03	1
120 mm	Solid	0,68	0,78	0,88	0,92	0,88	0,89	0,94	0,97	0,96	0,96	0,98	0,99	1,00	1,01	1,02	1,02	1,03	1,03	1
140 mm	Solid	0,74	0,85	0,90	0,87	0,87	0,92	0,96	0,95	0,95	0,97	0,98	0,99	1,00	1,01	1,02	1,02	1,03	1,03	1
160 mm	Solid	0,81	0,88	0,86	0,85	0,89	0,94	0,95	0,94	0,95	0,97	0,98	0,99	1,00	1,01	1,02	1,02	1,03	1,03	1
180 mm	Solid	0,86	0,85	0,84	0,85	0,91	0,94	0,93	0,94	0,96	0,97	0,98	0,99	1,00	1,01	1,02	1,02	1,03	1,03	1
200 mm	Solid	0,83	0,82	0,83	0,87	0,93	0,93	0,92	0,94	0,96	0,97	0,98	0,99	1,00	1,01	1,02	1,02	1,03	1,03	1
220 mm	Solid	0,81	0,81	0,84	0,90	0,93	0,92	0,92	0,94	0,96	0,97	0,98	0,99	1,00	1,01	1,02	1,02	1,03	1,03	1
240 mm	Solid	0,79	0,80	0,85	0,91	0,92	0,91	0,93	0,94	0,96	0,97	0,98	0,99	1,00	1,01	1,02	1,02	1,03	1,03	1

Bonding primers: PROJISO FIXO B® and PROJISO FIXO M®

Finish: SIDAIRLESS®



Projiso proposes an innovative solution, based on sprayed Fibrexpan®, designed to improve sound insulation between superimposed rooms.

Assembly principle

Fix an expanded metal sheet to the concrete slab.

Spray Fibrexpan® in one or more layers until the desired thickness is reached.

The table below gives sound reduction values ΔR_w+ C for a concrete slab with different coating thicknesses of Fibrexpan®, as described above.

ΔRw+C (dB)		Thickness of the concrete slab												
		140 mm	150 mm	160 mm	170 mm	180 mm	190 mm	200 mm	210 mm	220 mm	230 mm	240 mm	250 mm	Gain dB
		Results slab + insulation system in ΔRw+C												
Bare slab ΔRw+c (dB) Qualitel reference guide		54dB	56dB	57dB	58dB	59dB	60dB	61dB	62dB	62dB	63dB	64dB	65dB	
Thicknesses of Fibrexpan® with wire mesh fixed directly under the concrete slab	80 mm	54dB	56dB	57dB	58dB	59dB	60dB	61dB	62dB	62dB	63dB	64dB	65dB	0dB
	90 mm	55dB	57dB	58dB	59dB	60dB	61dB	62dB	63dB	63dB	64dB	65dB	66dB	1dB
	100 mm	55dB	57dB	58dB	59dB	60dB	61dB	62dB	63dB	63dB	64dB	65dB	66dB	1dB
	110 mm	56dB	58dB	59dB	60dB	61dB	62dB	63dB	64dB	64dB	65dB	66dB	67dB	2dB
	120 mm	56dB	58dB	59dB	60dB	61dB	62dB	63dB	64dB	64dB	65dB	66dB	67dB	2dB
	130 mm	57dB	59dB	60dB	61dB	62dB	63dB	64dB	65dB	65dB	66dB	67dB	68dB	3dB
	140 mm	58dB	60dB	61dB	62dB	63dB	64dB	65dB	66dB	66dB	67dB	68dB	69dB	4dB
	150 mm	58dB	60dB	61dB	62dB	63dB	64dB	65dB	66dB	66dB	67dB	68dB	69dB	4dB
	160 mm	59dB	61dB	62dB	63dB	64dB	65dB	66dB	67dB	67dB	68dB	69dB	70dB	5dB
	170 mm	60dB	62dB	63dB	64dB	65dB	66dB	67dB	68dB	68dB	69dB	70dB	71dB	6dB
	180 mm	60dB	62dB	63dB	64dB	65dB	66dB	67dB	68dB	68dB	69dB	70dB	71dB	6dB
	190 mm	61dB	63dB	64dB	64dB	66dB	67dB	68dB	69dB	69dB	70dB	71dB	72dB	7dB
	200 mm	61dB	63dB	64dB	64dB	66dB	67dB	68dB	69dB	69dB	70dB	71dB	72dB	7dB
	210 mm	62dB	64dB	65dB	66dB	67dB	68dB	69dB	70dB	70dB	71dB	72dB	73dB	8dB
220 mm	63dB	65dB	66dB	67dB	68dB	69dB	70dB	71dB	71dB	72dB	73dB	74dB	9dB	
230 mm	63dB	65dB	66dB	67dB	68dB	69dB	70dB	71dB	71dB	72dB	73dB	74dB	9dB	
240 mm	64dB	66dB	67dB	68dB	69dB	70dB	71dB	72dB	72dB	73dB	74dB	75dB	10dB	
With Sidarless® finish	between 1dB and 2dB of additional gain depending on thicknesses (please contact us for information)													

Example: a system consisting of a 200 mm thick slab sprayed with 140 mm of Fibrexpan® according to the application described above will have a sound attenuation of ΔR_w+c = 65 dB compared with 61 dB for a bare slab.

These values are taken from calculations based on laboratory tests. On-site results may differ slightly due to the site's configuration and the application conditions.

Fibrofeu®

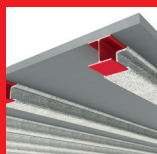
Conventional fire protection and acoustic insulation

A red lowercase letter 'i' inside a white square, representing an information icon.

Technical Datasheet - Fibrofeu®



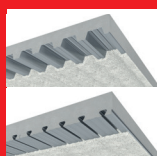
Fire protection of concrete structures using Fibrofeu®



Fire protection of steel beams using Fibrofeu®



Fire protection of steel columns using Fibrofeu®



Fire protection of structural floor trays using Fibrofeu®

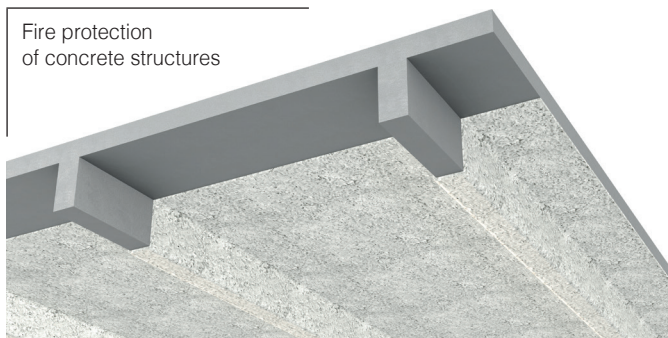


Fire protection of wood floors using Fibrofeu®

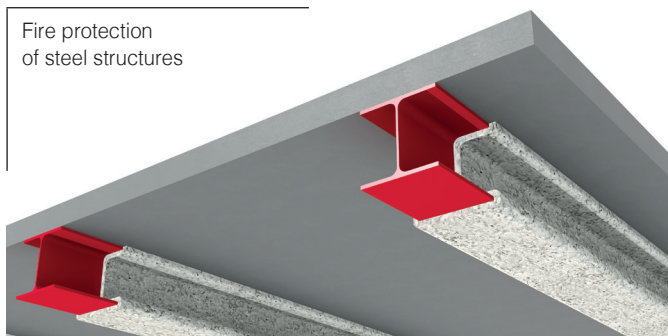


Acoustic correction using Fibrofeu®

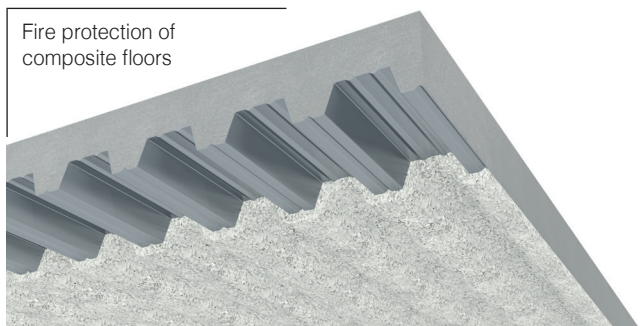
Fire protection
of concrete structures



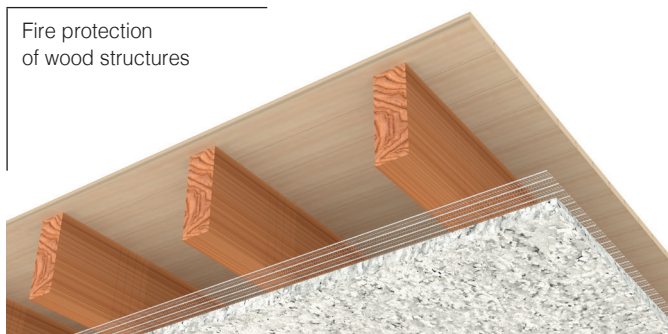
Fire protection
of steel structures



Fire protection of
composite floors



Fire protection
of wood structures



Application scope

Fire protection.
Acoustic correction.



Product description

Fibrofeu® is a spray-on fibrous mixture used for protection against fire. The material comprises slag wool, with hydraulic and inorganic binders. It takes the form of light flakes.

Applications

- Concrete floors and structures
- Concrete beams and slab floors
- Concrete slabs with structural steel floor trays
- Wood floors (sprayed onto expanded metal sheet)
- Steel structures

Properties and performance

- Rot-proof - Non-combustible
- Ease of implementation

Implementation

Refer to the reference reports and the installation rules specified in DTU 27.1.

Bonding primers

PROJISO FIXO B® (concrete) - PROJISO FIXO M® (metal)
PROJISO FIXO M+® (concrete - metal)

Finish

PROJISO FIXO DUR®, SIDAIRLESS®

Environment and safety

Refer to the Environmental and Health Declaration Sheet (FDES) and the Safety Data Sheet (FDS), available on request. Do not discharge waste into drains, waterways or the ground. Use the bin bags provided for this purpose.

Packaging and storage

- Storage period: 12 months maximum from the date of manufacture in unopened packaging.
- Storage conditions: protect from frost, moisture, excessive heat and excessive radiant sunlight.
- Packaging: 20 kg plastic bag.
- Palletising: 30 bags per pallet i.e. 600 kg.

Characteristics

Colour	Off-white
Appearance	Rolled or pressed
Density	250 kg/m ³ ± 15%
Reaction to fire	A1 - SINTEF report 102010.02/09.024A
pH	10
Initial setting time	24 hours at 20°C and 50% RH
Setting mode	Hydraulic setting
Use temperature	5 to 45 °C
Low biopersistence	As per directive CE 97/69
Thermal conductivity	05 W/m.k (see RT 2012)
VOC rating	A+
Other	FDES - FDS - CE Marking

The information given in this technical document is based on current tests and is assumed to be product specific. However, no guarantee of results is implied, as the conditions of use are beyond our control.

R/REI 60 to 240



Application scope

- Application on solid reinforced concrete elements
- Protection thickness for flat slabs or walls between 14 and 36 mm
- Protection thickness for rectangular beams between 17 and 48 mm
- Application on unsurfaced concrete structures, poured with mineral oil or emulsion form release agents
- Application on flat slabs, rectangular beams, walls exposed on one side only
- Thickness of flat slabs greater than or equal to 120 mm
- Thickness of load-bearing walls greater than or equal to 130 mm
- Width of rectangular beams greater than or equal to 150 mm
- Substrate treated with PROJISO FIXO-B® bonding primer prior to application
- Can be finished with PROJISOFIXO-DUR® or SIDAIRLESS®

Required thickness for the protection of reinforced concrete slabs designed according to EUROCODE EN 1992-1-2

Slab Thickness ≥ 120 mm Initial coating of any steel	Performance				
	REI 60	REI 90	REI 120	REI 180	REI 240
Minimum thickness of Fibrofeu® (in mm)	14	14	14	17	36

Required thickness for the protection of reinforced concrete beams designed according to EUROCODE EN 1992-1-2

Beam on single supports Width ≥ 150 mm	Performance				
	R 60	R 90	R 120	R 180	R 240
Initial coating (in mm) on steel	0 10 20 30	0 10 20 30	0 10 20 30	0 10 20 30	0 10 20 30
Thickness of Fibrofeu® (in mm)	17 17 17 17	17 17 17 17	20 17 17 17	32 26 20 17	48 48 48 48

Required thickness for the protection of reinforced concrete beams designed according to EUROCODE EN 1992-1-2

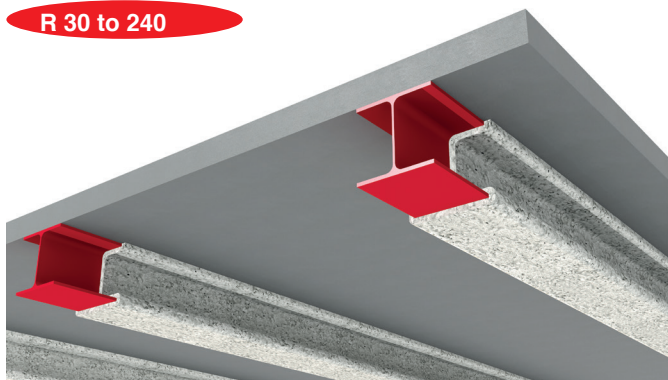
Continuous beam Width ≥ 150 mm	Performance				
	R 60	R 90	R 120	R 180	R 240
Initial coating (in mm) on steel	0 10 20 30	0 10 20 30	0 10 20 30	0 10 20 30	0 10 20 30
Thickness of Fibrofeu® (in mm)	17 17 17 17	17 17 17 17	17 17 17 17	20 17 17 17	48 48 48 48

Required thickness for the protection of reinforced concrete load-bearing walls designed according to EUROCODE EN 1992-1-2

Wall exposed on one side only Thickness ≥ 130 mm Initial coating of any steel	Performance			
	REI 60	REI 90	REI 120	REI 180
Minimum thickness of Fibrofeu® (in mm)	14	14	14	33

For any other type of implementation, please contact us.

R 30 to 240



Application scope

- Application on untreated or rustproofed steel substrates; although our products do not promote the corrosion of steel, a treated substrate (galvanisation or primer such as alkyd, epoxy, zinc rich epoxy or zinc silicate) is recommended for long-term corrosion resistance.
- Application on a clean, dry substrate, free of dust, mill scale, rust, oil and any other contaminants that may impair adhesion.
- Application on a surface previously treated with PROJISO FIXO M® bonding primer.
- Critical temperature: 570° C
- Can be finished with PROJISOFIXODUR® or SIDAIRLESS®

Beam exposed on 3 sides	R				
	30	60	90	120	180
HEA-100	15	24	40	56	HP
HEA-120	15	24	40	56	HP
HEA-140	15	23	39	54	HP
HEA-160	15	21	36	51	79
HEA-180	15	21	36	51	79
HEA-200	15	20	35	49	77
HEA-220	15	19	33	47	74
HEA-240	15	17	30	43	69
HEA-260	15	17	30	43	69
HEA-280	15	16	28	41	66
HEA-300	15	15	27	39	63
HEA-320	15	15	25	36	60
HEA-340	15	15	25	36	60
HEA-360	15	15	23	34	56
HEA-400	15	15	23	34	56
HEA-450	15	15	21	31	52
HEA-500	15	15	21	31	52
HEA-550	15	15	21	31	52
HEA-600	15	15	19	28	48

Beam exposed on 3 sides	R				
	30	60	90	120	180
IPE- 80	15	35	54	71	HP
IPE-100	15	32	51	69	HP
IPE-120	15	31	50	67	HP
IPE-140	15	30	48	65	HP
IPE-160	15	28	45	62	HP
IPE-180	15	27	44	61	HP
IPE-200	15	25	42	58	HP
IPE-220	15	25	41	57	HP
IPE-240	15	23	39	54	HP
IPE-270	15	22	37	53	HP
IPE-300	15	21	36	51	79
IPE-330	15	20	35	49	77
IPE-360	15	19	33	47	74
IPE-400	15	18	32	45	72
IPE-450	15	17	30	43	69
IPE-500	15	16	28	41	66
IPE-550	15	15	27	39	63
IPE-600	15	15	25	36	60

Beam exposed on 3 sides	R				
	30	60	90	120	180
UAP- 80	15	28	45	62	HP
UAP-100	15	27	44	61	HP
UAP-130	15	25	42	58	HP
UAP-150	15	23	39	54	HP
UAP-175	15	23	39	54	HP
UAP-200	15	22	37	53	HP
UAP-220	15	21	36	51	79
UAP-250	15	19	33	47	74
UAP-270	15	19	33	47	74
UAP-300	15	18	32	45	72

Beam exposed on 3 sides	R				
	30	60	90	120	180
HEB-100	15	20	35	49	77
HEB-120	15	19	33	47	74
HEB-140	15	18	32	45	72
HEB-160	15	16	28	41	66
HEB-180	15	16	28	41	66
HEB-200	15	15	27	39	63
HEB-220	15	15	25	36	60
HEB-240	15	15	23	34	56
HEB-260	15	15	23	34	56
HEB-280	15	15	23	34	56
HEB-300	15	15	21	31	52
HEB-320	15	15	21	31	52
HEB-340	15	15	19	28	48
HEB-360	15	15	19	28	48
HEB-400	15	15	19	28	48
HEB-450	15	15	17	26	44
HEB-500	15	15	17	26	44
HEB-550	15	15	17	26	44
HEB-600	15	15	17	26	44

Beam exposed on 3 sides	R				
	30	60	90	120	180
IPN- 80	15	33	52	69	HP
IPN-100	15	30	49	66	HP
IPN-120	15	28	45	62	HP
IPN-140	15	25	42	58	HP
IPN-160	15	24	40	56	HP
IPN-180	15	22	37	53	HP
IPN-200	15	21	36	51	79
IPN-220	15	20	35	49	77
IPN-240	15	19	33	47	74
IPN-260	15	17	30	43	69
IPN-280	15	16	28	41	66
IPN-300	15	16	28	41	66
IPN-320	15	15	27	39	63
IPN-340	15	15	25	36	60
IPN-360	15	15	23	34	56
IPN-380	15	15	23	34	56
IPN-400	15	15	21	31	52
IPN-425	15	15	21	31	52
IPN-450	15	15	19	28	48
IPN-475	15	15	19	28	48
IPN-500	15	15	19	28	48
IPN-550	15	15	17	26	44
IPN-600	15	15	15	23	39

Note

These thicknesses are in mm and have been calculated for a critical temperature of 570 °C, for beams exposed on 3 sides.

For any other implementation, please contact us.

HP : Not in the report

R 30 to 240



Application scope

- Application on untreated or rustproofed steel substrates; although our products do not promote corrosion of steel, a treated substrate (galvanisation or primer such as alkyd, epoxy, zinc rich epoxy or zinc silicate) is recommended for long-term corrosion resistance.
- Application on a clean, dry substrate, free of dust, mill scale, rust, oil and any other contaminants that may impair adhesion.
- Application on a surface previously treated with PROJISO FIXO M® bonding primer.
- Critical temperature: 500° C
- Can be finished with PROJISOFIXODUR® or SIDAIRLESS®

Columns 4 sides	R				
	30	60	90	120	180
HEA-100	15	31	50	68	HP
HEA-120	15	31	50	68	HP
HEA-140	15	30	49	66	HP
HEA-160	15	28	46	64	HP
HEA-180	15	27	45	63	HP
HEA-200	15	27	44	61	HP
HEA-220	15	25	41	58	HP
HEA-240	15	23	39	54	HP
HEA-260	15	23	39	54	HP
HEA-280	15	22	37	53	HP
HEA-300	15	20	36	50	79
HEA-320	15	19	34	48	76
HEA-340	15	18	32	46	73
HEA-360	15	17	30	44	70
HEA-400	15	17	30	44	70
HEA-450	15	16	28	41	67
HEA-500	15	15	26	38	63
HEA-550	15	15	26	38	63
HEA-600	15	15	26	38	63

Columns 4 sides	R				
	30	60	90	120	180
HEB-100	15	27	44	61	HP
HEB-120	15	26	43	60	HP
HEB-140	15	24	40	56	HP
HEB-160	15	22	37	53	HP
HEB-180	15	20	36	50	79
HEB-200	15	19	34	48	76
HEB-220	15	18	32	46	73
HEB-240	15	18	32	46	73
HEB-260	15	17	30	44	70
HEB-280	15	17	30	44	70
HEB-300	15	16	28	41	67
HEB-320	15	15	26	38	63
HEB-340	15	15	26	38	63
HEB-360	15	15	26	38	63
HEB-400	15	15	24	35	58
HEB-450	15	15	24	35	58
HEB-500	15	15	22	32	54
HEB-550	15	15	22	32	54
HEB-600	15	15	22	32	54

Columns 4 sides	R				
	30	60	90	120	180
IPE-100	16	38	59	77	HP
IPE-120	15	37	57	75	HP
IPE-140	15	36	56	74	HP
IPE-160	15	34	53	71	HP
IPE-180	15	33	53	71	HP
IPE-200	15	31	50	68	HP
IPE-220	15	30	49	66	HP
IPE-240	15	28	46	64	HP
IPE-270	15	27	45	63	HP
IPE-300	15	27	44	61	HP
IPE-330	15	25	41	58	HP
IPE-360	15	24	40	56	HP
IPE-400	15	23	39	54	HP
IPE-450	15	22	37	53	HP
IPE-500	15	19	34	48	76
IPE-550	15	19	34	48	76
IPE-600	15	17	30	44	70

Columns 4 sides	R				
	30	60	90	120	180
IPN- 80	17	39	60	78	HP
IPN-100	15	36	57	75	HP
IPN-120	15	34	53	71	HP
IPN-140	15	32	51	69	HP
IPN-160	15	30	49	66	HP
IPN-180	15	27	45	63	HP
IPN-200	15	27	44	61	HP
IPN-220	15	25	41	58	HP
IPN-240	15	24	40	56	HP
IPN-260	15	22	37	53	HP
IPN-280	15	20	36	50	79
IPN-300	15	19	34	48	76
IPN-320	15	19	34	48	76
IPN-340	15	18	32	46	73
IPN-360	15	17	30	44	70
IPN-380	15	16	28	41	67
IPN-400	15	16	28	41	67
IPN-425	15	15	26	38	63
IPN-450	15	15	26	38	63
IPN-475	15	15	24	35	58
IPN-500	15	15	24	35	58
IPN-550	15	15	22	32	54
IPN-600	15	15	19	29	49

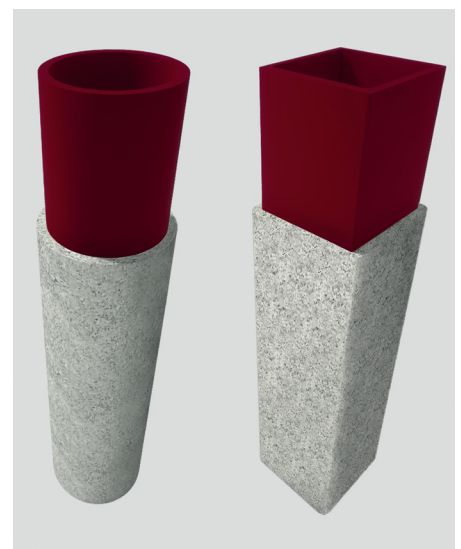
Columns 4 sides	R				
	30	60	90	120	180
UAP- 80	15	34	53	71	HP
UAP-100	15	33	53	71	HP
UAP-130	15	31	50	68	HP
UAP-150	15	28	46	64	HP
UAP-175	15	27	45	63	HP
UAP-200	15	27	44	61	HP
UAP-220	15	26	43	60	HP
UAP-250	15	24	40	56	HP
UAP-270	15	23	39	54	HP
UAP-300	15	22	37	53	HP

Note

These thicknesses are in mm and have been calculated for a critical temperature of 500°C, for columns exposed on 4 sides.

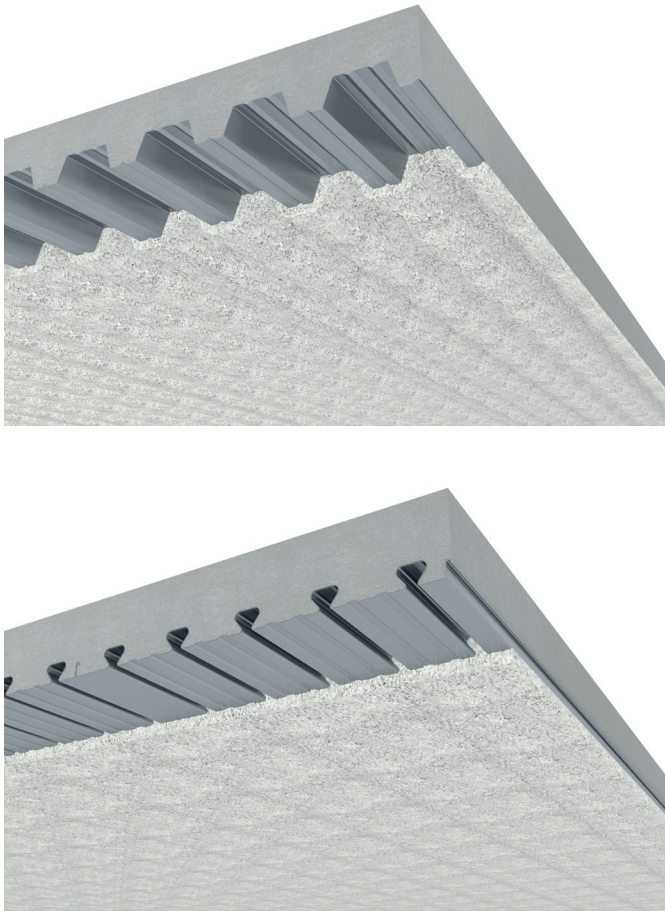
For any other implementation, please contact us.

HP : Not in the report



For rectangular and circular hollow pipes, please contact us.

REI 30 to 180



Application scope

- Protection thickness between 13 and 31 mm on trapezoidal structural steel floor trays
- 23 to 39 mm on dovetailed structural steel floor trays
- Thickness of sheet metal of structural steel floor trays greater than or equal to 0.75 mm
- Width of the bottom of the corrugation (L2) of structural steel floor trays less than or equal to 187 mm
- Corrugation height (H2) of structural steel floor trays less than or equal to 87 mm
- Applicable to any mixed slab with trapezoidal structural steel floor trays, with effective thickness* greater than or equal to 73 mm
- Applicable to all composite slabs with dovetailed structural steel floor trays, with effective thickness* greater than or equal to 80 mm
- Can be finished with PROJISO FIXO DUR® or SIDAIRLESS®

Assembly principle

- Cleaning of steel trays
- Application of the bonding primer
- Spraying of Fibrofeu® in one or more passes to achieve the thickness required by the report

Figure 1

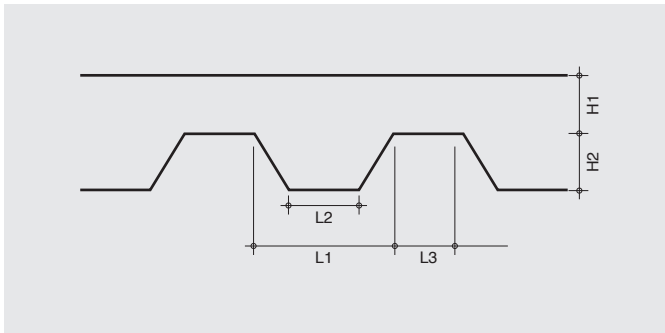
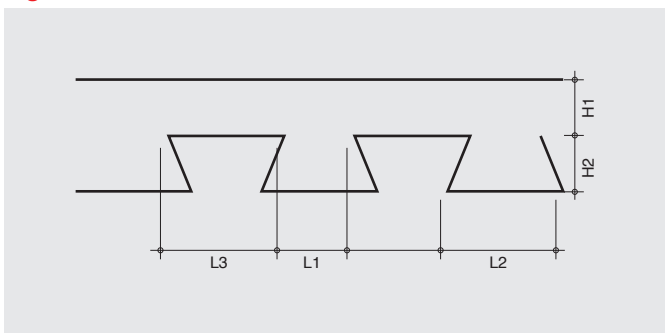


Figure 2



Thickness required on trapezoidal corrugated structural steel floor trays (Figure 1)

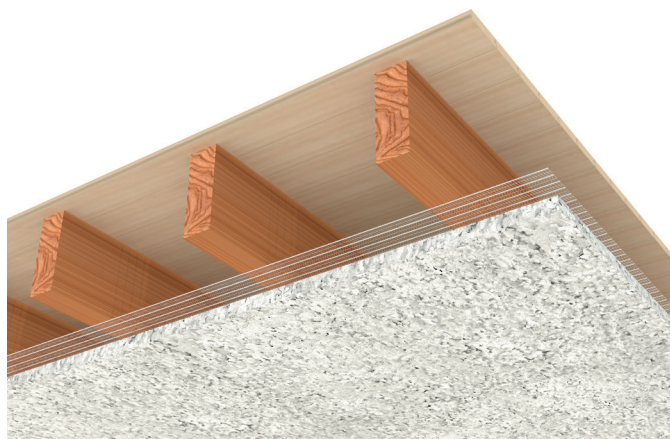
REI	Thickness of Fibrofeu®
30	13 mm
60	15 mm
90	23 mm
120	31 mm

Thickness requirements for dovetailed corrugated structural steel floor trays (Figure 2)

REI	Thickness of Fibrofeu®
30	23 mm
60	23 mm
90	23 mm
120	27 mm
180	39 mm

$$\text{*Effective thickness} = H1 + \frac{H2 \times (L1 + L2) / 2}{L1 + L3}$$

REI 30 to 120



Thickness required for REI performance

REI	Thickness of Fibrofeu®
30	24 mm
60	33 mm
90	54 mm
120	80 mm

General

The fire stability of wooden substrates and structures is achieved by limiting the temperature rise of the wood.

The fire protection of wood cannot be applied directly to the wood and must be accompanied by the installation of an expanded metal sheet.

The protection comprises Nergalto NG1 or equivalent sheets laid perpendicular to the joists (the sheets are laid side by side with an overlap of 100 mm) and an application of Fibrofeu®.

Application scope

- Joist spacing less than or equal to 600 mm
- Joist height greater than or equal to 220 mm
- Floor thickness greater than or equal to 23 mm (test carried out with a pine slatted floor)
- Can be finished with PROJISO FIXO DUR® or SIDAIRLESS®

For any other implementation, please contact us.

Fibrofeu® - Test report TNO and CSTB

Thickness of Fibrofeu®	Substrate	Frequency in Hertz																		α_w
		100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	
		Absorption coefficient α_s																		
45 mm	Solid	0,16	0,25	0,40	0,56	0,80	0,95	0,97	0,99	0,99	1,02	0,98	1,01	1,07	1,04	1,03	1,05	1,09	1,11	1
35 mm	Solid	0,10	0,14	0,21	0,34	0,48	0,65	0,74	0,88	0,94	1,05	1,01	1,07	1,03	0,98	0,99	1,04	1,01	0,89	0,80 (H)
25 mm	Solid	0,06	0,08	0,15	0,18	0,33	0,41	0,57	0,70	0,87	0,88	0,96	1,06	1,09	1,01	1,03	1,04	1,00	0,89	0,60 (MH)
15 mm	Solid	0,02	0,04	0,06	0,09	0,15	0,22	0,30	0,43	0,55	0,67	0,78	0,88	0,94	0,95	1,03	1,00	1,01	0,86	0,45 (MH)

Bonding primers: PROJISO FIXO B® and PROJISO FIXO M®

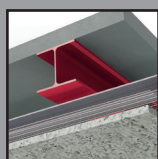
Finishing product: SIDAIRLESS®

Firespray®

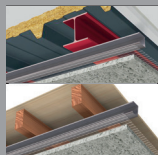
**Fire insulation - Roofing - Ducts - Sheet Metal
Composite floors - Wood floors – Floor slabs**

i

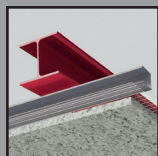
Technical Datasheet - Firespray®



Fire protection of composite floors with Firespray® membrane



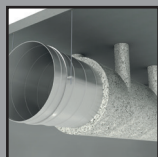
**Fire protection of steel roof pans with Firespray®
Fire protection of wood floors with Firespray®**



Fire protection of structural frames with Firespray®



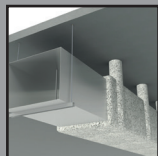
Fire protection of horizontal and vertical circular sheet metal ventilation ducts with Firespray®



Fire protection of horizontal and vertical circular sheet metal smoke extraction ducts with Firespray®



Fire protection of horizontal and vertical rectangular sheet metal ventilation ducts with Firespray®



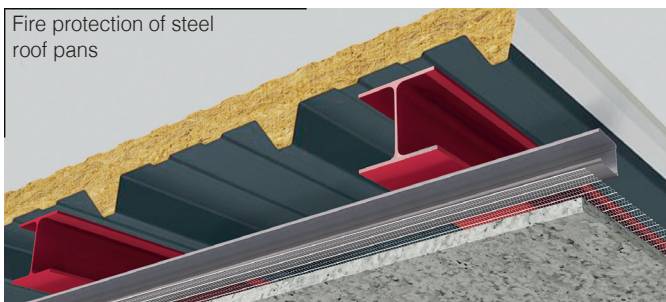
Fire protection of horizontal and vertical rectangular sheet metal smoke extraction ducts with Firespray®

Fire protection of ceramic concrete floor slabs with Firespray®

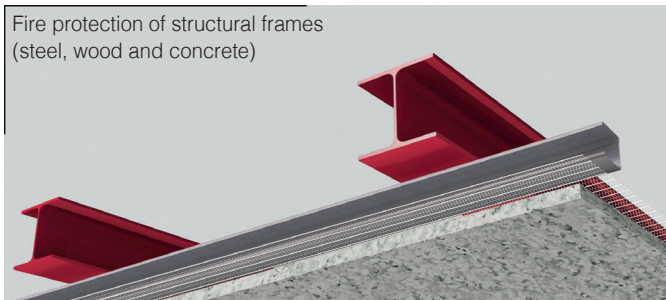
Projects in progress

Projects in progress

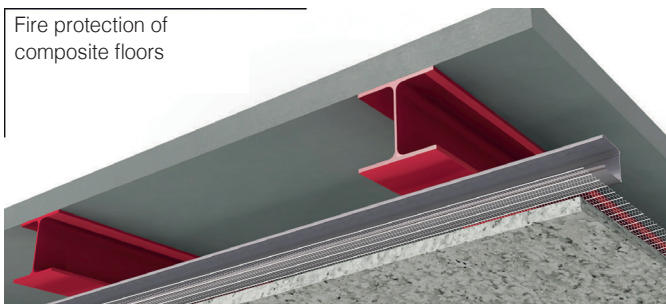
Fire protection of steel roof pans



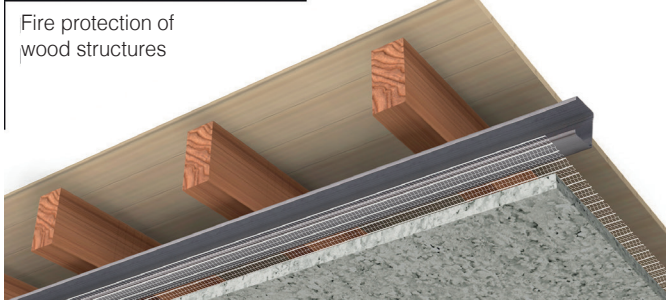
Fire protection of structural frames (steel, wood and concrete)



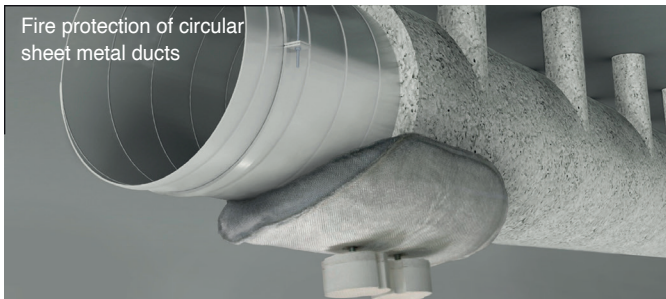
Fire protection of composite floors



Fire protection of wood structures



Fire protection of circular sheet metal ducts



Fire protection of rectangular sheet metal ducts



Application scope

Fire protection



Product description

Firespray® is a spray-on fibrous mixture used for fire protection insulation. The material comprises slag wool, with hydraulic and inorganic binders. It takes the form of light flakes.

Applications

Membrane fire protection

- Composite floors
- Structural frames (reduced infinite plenum)
- Insulated and non-insulated steel roof pan. Fire protection of sheet metal ducts
- Horizontal and vertical circular ventilation and smoke extraction ducts
- Horizontal and vertical rectangular ventilation and smoke extraction ducts
- Wood floors
- Ceramic and concrete slab floors

Properties and performance

- Rot-proof - Non-combustible
- Ease of implementation

Implementation

Refer to the reference reports and the installation rules specified in DTU 27.1.

Finish

PROJISO FIXO DUR®, SIDAIRLESS®

Environment and safety

Refer to the Safety Data Sheet (FDS), available on request. Do not discharge waste into drains, waterways or the ground. Use the bin bags provided for this purpose.

Packaging and storage

- Storage period: 12 months maximum from the date of manufacture in unopened packaging.
- Storage conditions: protect from frost, moisture, excessive heat and excessive radiant sunlight.
- Packaging: 25 kg plastic bag.
- Palletising: 30 bags per pallet i.e. 750 kg.

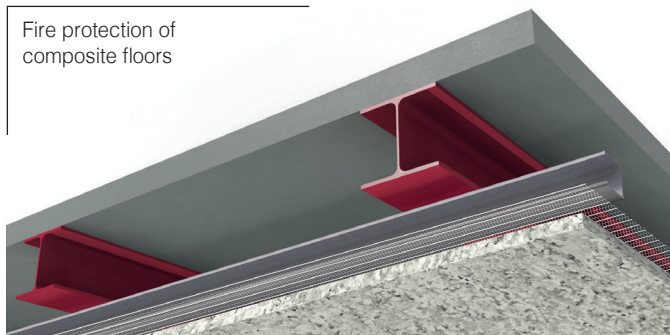
Characteristics

Colour	Grey/White
Appearance	Rolled or pressed
Density	220 kg/m ³ ± 15 %
Reaction to fire	A1 - EFR rating report EFR 17-003862
pH	10
Initial setting time	24 hours at 20 °C and 50 % RH
Setting mode	Hydraulic setting
Use temperature	5 to 45 °C
Low biopersistence	As per directive CE 97/69
Thermal conductivity	0,05 W/m.k (cf RT 2012)
VOC rating	A+
Other	FDS

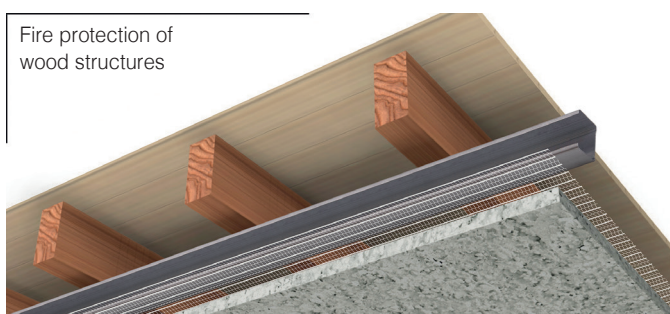
The information given in this technical document is based on current tests and is assumed to be specific to the product. However, no guarantee of results is implied, as the conditions of use are beyond our control.

REI 30 to 240

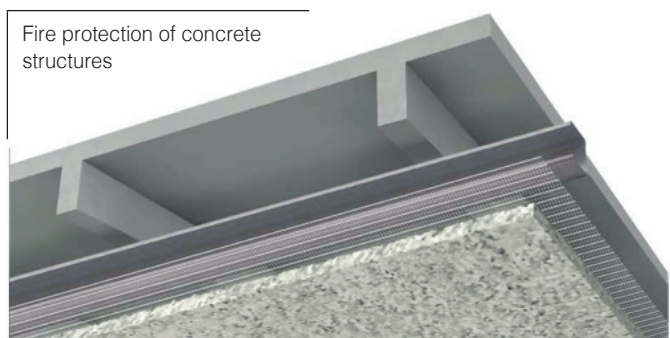
Fire protection of composite floors



Fire protection of wood structures



Fire protection of concrete structures



Application scope

- Protection thickness between 21 and 69 mm
- Minimum joist height 120 mm (IPE 120 or similar minimum, plus M48)
- Can be finished with PROJISO FIXO DUR® or SIDAIRLESS®

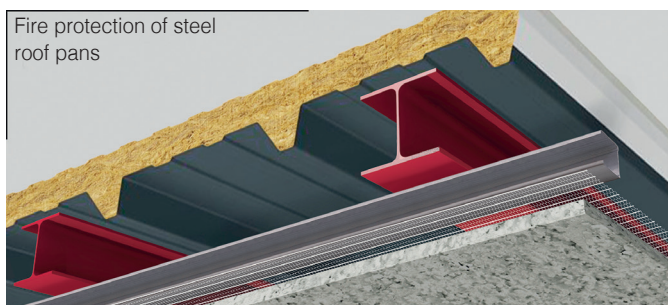
Assembly principle

- Placement of M48 studs directly on the floor joists at right angles with a maximum distance of 600 mm.
- Fixing of Nerfloc expanded metal using screws P109753.
- Spraying of FIRESPRAY® to the thickness required by the desired fire rating.

Thickness required for REI performance

Material of beams and joists	Material of the supporting floor	Reference temperature (°C)		Minimum thicknesses of FIRESPRAY® (mm)					
		In the plenum	In load-bearing structural elements	REI 30	REI 60	REI 90	REI 120	REI 180	REI 240
Reinforced concrete	Cellular concrete	600	-	21	21	21	24	34	43
Reinforced concrete	Reinforced concrete	600	-	21	21	21	24	34	43
Steel	Cellular concrete	530	510	21	21	23	30	43	56
Steel	Reinforced concrete	530	510	21	21	23	30	43	56
Reinforced concrete Steel	Concrete with structural steel floor trays	400	350	21	25	38	51	-	-
Cold-formed steel	Reinforced concrete Cellular concrete Concrete with structural steel floor trays	370	350	21	26	38	51	-	-
Wood	Cellular concrete	300	-	21	35	52	69	-	-
Wood	Reinforced concrete	300	-	21	35	52	69	-	-
Reinforced concrete	Wood	300	-	21	35	52	69	-	-
Steel	Wood	300	-	21	35	52	69	-	-
Wood	Wood	300	-	21	35	52	69	-	-

REI 30 to 180



NB: Under dry roof trays, option of response under building site notice, however in RE not in REI.

Application scope

- Protection thickness between 21 and 69 mm
- Minimum joist height 120 mm (IPE 120 or similar minimum, plus M48)
- Can be finished with PROJISO FIXO DUR® or SIDAIRLESS®
- 160 mm rockwool in roofing.

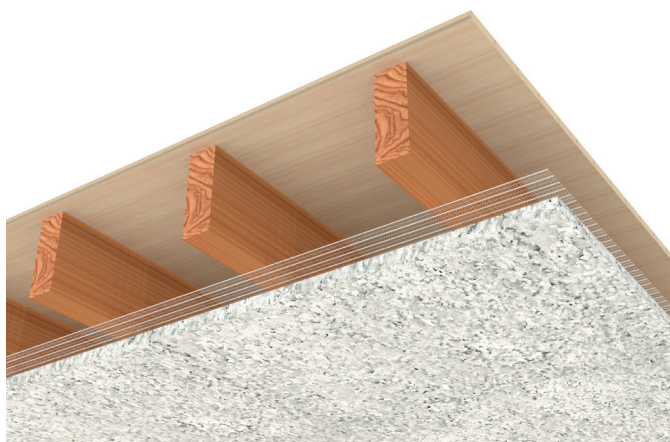
Assembly principle

- Placement of M48 furrings directly on the bottom flanges of the structural joists with a maximum spacing of 600 mm (perpendicular or horizontal).
- Fixing of Nerfloc expanded metal using screws P109753.
- Spraying of FIRESPRAY® to the thickness required by the desired fire rating.

Thickness required for REI performance

R	E	I	t (minutes)	Thickness (mm)
R	E	I	30	21
R	E	I	60	21
R	E	I	90	21
R	E	I	120	21
R	E	I	180	69

REI 120



Thickness required for REI performance

REI	Thickness of Firespray®
120	56 mm

General

The fire stability of wood substrates and structures is achieved by limiting the temperature rise of the wood.

The fire protection of wood cannot be applied directly to the wood and must be accompanied by the installation of an expanded metal sheet.

The protection system comprises sheets of wire mesh or equivalent laid perpendicular to the joists (sheets are laid side by side with an overlap of 100 mm) and an application of Firespray®.

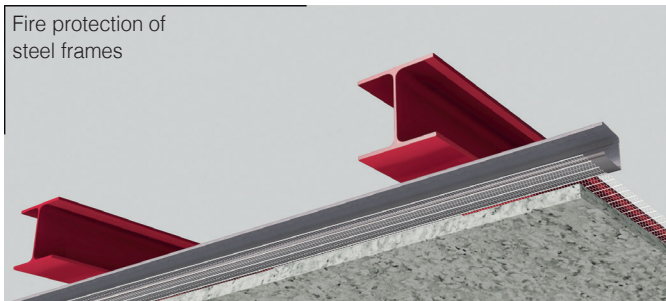
Application scope

- Joist spacing less than or equal to 600 mm
- Joist height greater than or equal to 220 mm
- Floor thickness greater than or equal to 23 mm (test carried out with a pine slatted floor)
- Can be finished with PROJISO FIXO DUR® or SIDAIRLESS®

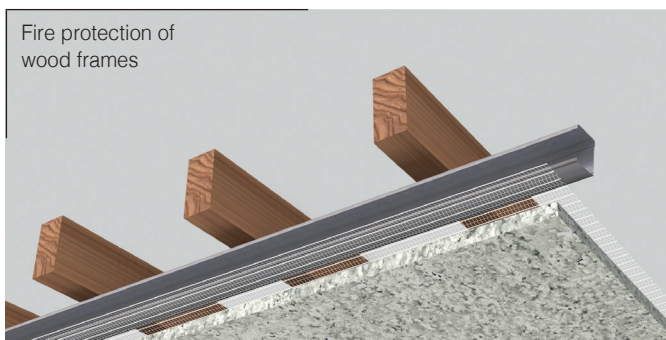
For any other implementation, please contact us.

R 30 to 240

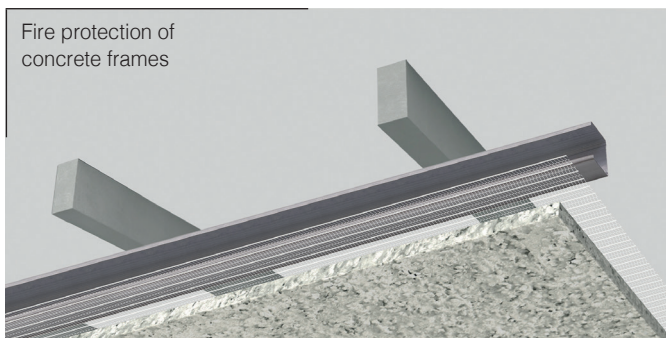
Fire protection of steel frames



Fire protection of wood frames



Fire protection of concrete frames



Application scope

- Protection thickness between 21 and 69 mm
- Minimum joist height 120 mm (IPE 120 or similar minimum, plus M48)
- Can be finished with PROJISO FIXO DUR® or SIDAIRLESS®

Assembly principle

- Placement of M48 furrings directly on the joists at right angles with a maximum spacing of 600 mm.
- Fixing of Nerfloc expanded metal using screws P109753.
- Application of FIRESPRAY® according to the desired fire rating.

Thickness required for performance R

STRUCTURE	Minimum thickness of FIRESPRAY® in mm					
	R30	R60	R90	R120	R180	R240
WOOD	21	40	59	69	-	-
STEEL	21	21	28	34	47	59
CONCRETE	21	21	21	29	44	59

Ducts tested according to NF / EN 1366-1 - Classification based on NF / EN 13501-3

Performance of horizontal and vertical circular ventilation ducts

Thickness of FIRESPRAY®	E	I	t	ve	ho	i	↔	0	S
56 mm	E	I	60	ve	ho	i	↔	0	S
80 mm	E	I	120	ve	ho	i	↔	0	S

Photo 1



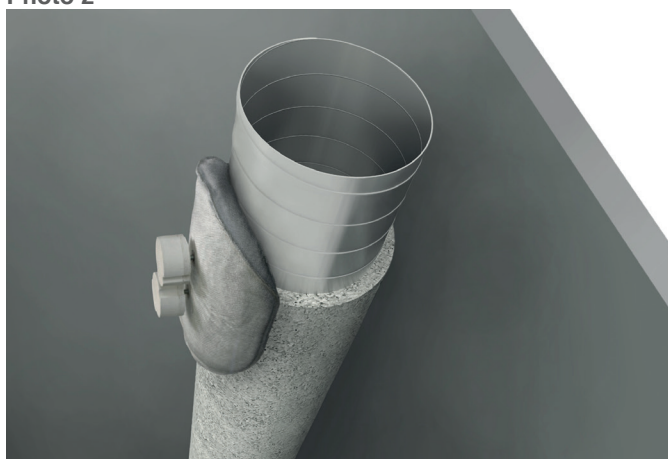
Application store

- Horizontal and vertical circular ducts
- Duct diameter between 0 and 1000 mm
- Maximum length of sections: 1300 mm
- Sheet metal thickness of duct

Duct diameter (mm)	0 to 314	315 to 560	561 to 629	630 to 1000
Minimum sheet thickness (mm)	5/10	6/10	8/10	10/10

- Maximum centre distance of support systems: 1588 mm
- Density of Firespray®: 220kg/m³ ± 15%
- Inspection hatch possible for both horizontal and vertical ventilation (see photos 1 and 2)

Photo 2



Duct assembly principle

The duct comprises sections with maximum length 1300mm. These sections are connected to each other by circular galvanised steel flanges, fixed to the duct by means of clinching and self-drilling screws.

Galvanised steel clamps are fitted at the junctions between sections, ensuring solid assembly of the flanges to the pipe.

Support system for horizontal ducts (see sketches 1 and 2))

- 0 to 630 mm: two half-clamps fixed together and supported by an M10 threaded rod.
- 631 to 1000 mm: a half collar positioned at the lower half-perimeter of the duct, supported on each side by M10 threaded rods.

Fire protection implementation principle

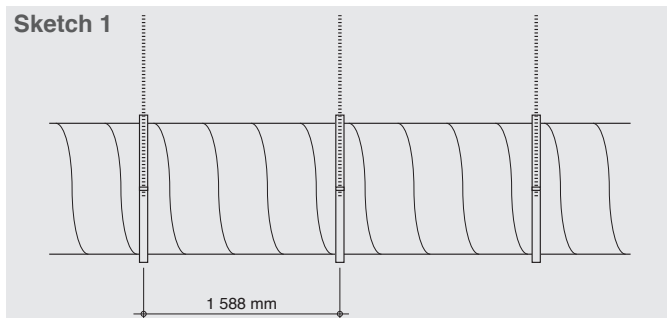
Protection of the duct body

- Firespray® is applied in one or more layers, i.e. 56 mm in 60 min, and 80 mm in 120 min.

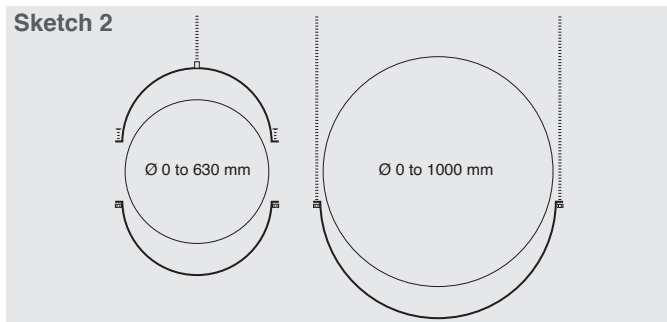
Protection of support systems

- The half-collar or half-collars are included in the protection of the duct body.
- The threaded rods are covered with a mesh and then sprayed with Firespray® to the same thickness as on the duct or by means of a 30mm thick rockwool shell followed by a mesh and application of Firespray® (shell + sprayed product with the same thickness as that used on the duct).

Sketch 1



Sketch 2



Ducts tested as per NF / EN 1366-1 and NF / EN 1366-8 - Classification as per NF / EN 13501-3

Performance of horizontal and vertical circular smoke extraction ducts

Thickness of FIRESPRAY®	E	I	t	ve	ho	S	Operating pressure	Multi
56 mm	E	I	60	ve	ho	S	-1000 / +300 Pa	Multi
80 mm	E	I	120	ve	ho	S	-1000 / +300 Pa	Multi

Photo 1

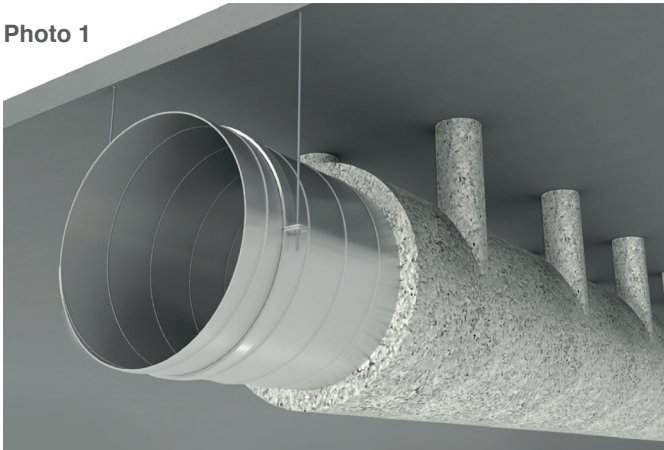
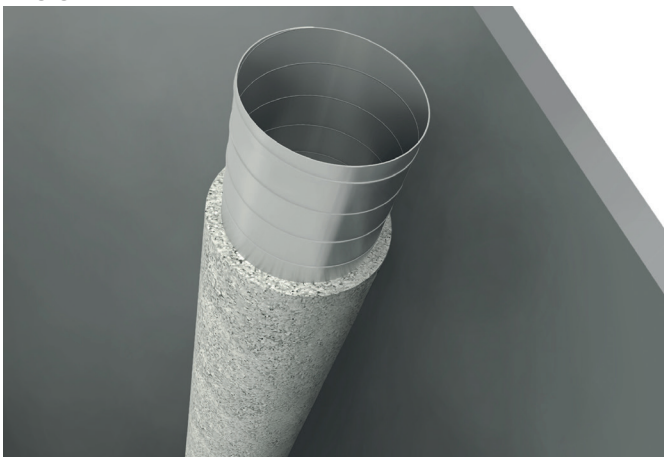


Photo 2



Application scope

- Horizontal and vertical circular ducts
- Duct diameter between 0 and 1000 mm
- Maximum length of sections: 1500 mm
- Sheet metal thickness of duct

Duct diameter (mm)	0 to 314	315 to 560	561 to 629	630 to 1000
Minimum sheet thickness (mm)	5/10	6/10	8/10	10/10

- Maximum centre distance of support systems: 900 mm
- Density of Firespray®: 220kg/m³ ± 15%

Duct assembly principle

The duct is comprised of sections of maximum length 1500mm. These sections are connected to each other by means of circular flanges made of galvanised steel, fixed to the duct by means of clinching and self-drilling screws. Galvanised steel clamps are fitted at the junctions between sections, ensuring the solid assembly of the flanges to the pipe.

Support system for horizontal ducts (see sketches 1 and 2))

- 0 to 630 mm: two half-clamps fixed together and supported by an M10 threaded rod.
- 631 to 1000 mm: a half collar positioned at the lower half-perimeter of the duct, supported on each side by M10 threaded rods.

Fire protection implementation principle

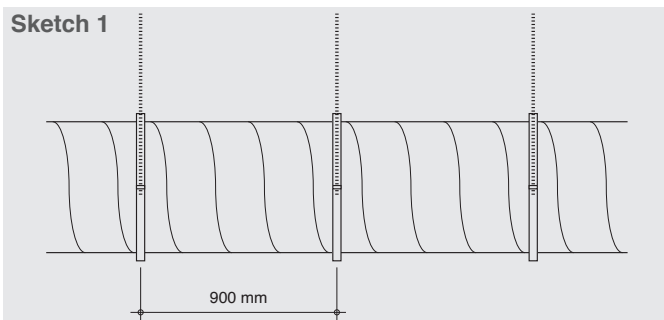
Protection of the duct body

- Firespray® is applied in one or more layers, i.e. 56 mm in 60 min, and 80 mm in 120 min.

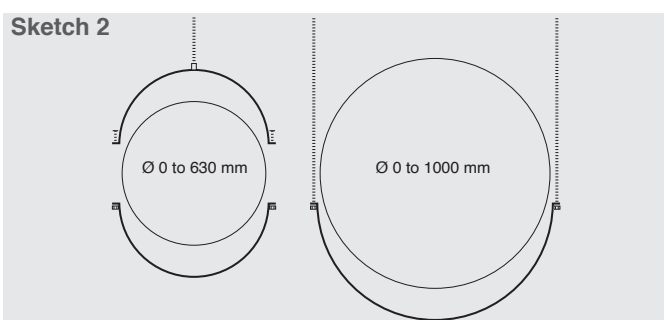
Protection of support systems

- The threaded rods are covered with a mesh and then sprayed with Firespray® to the same thickness as the duct or by means of a 30mm thick rockwool shell followed by a mesh and spraying of Firespray® (shell + sprayed product with the same thickness as that used on the duct).

Sketch 1



Sketch 2



Ducts tested according to NF / EN 1366-1 - Classification based on NF / EN 13501-3

Performance of horizontal and vertical rectangular ventilation ducts

Thickness of FIRESPRAY®	E	I	t	ve	ho	i	↔	0	S
53 mm	E	I	60	ve	ho	i	↔	0	S
74 mm	E	I	120	ve	ho	i	↔	0	S

Photo 1

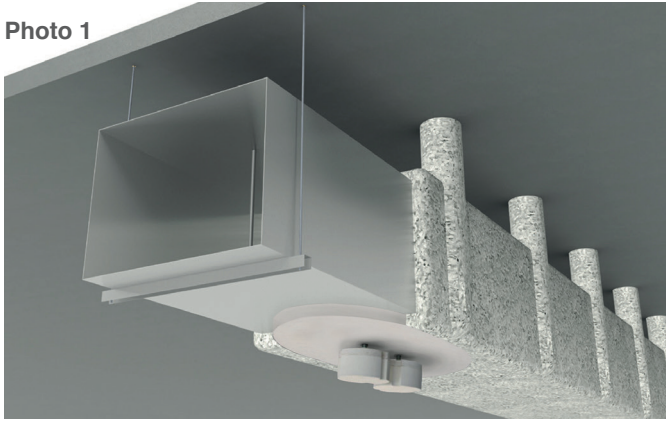
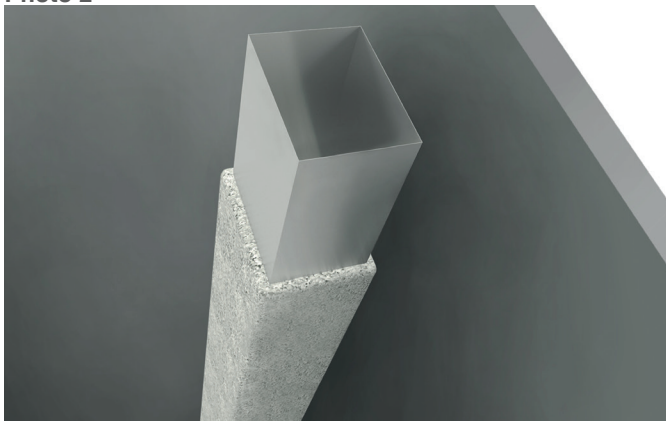


Photo 2



Application scope

- Horizontal and vertical rectangular ducts
- Sections 0x0mm to 1250x1000mm (w x H)
- Maximum length of sections: 1500 mm
- Sheet metal thickness of duct

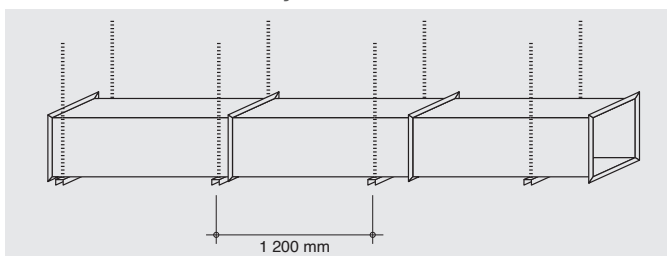
Sheet metal length (mm)	≤ 400	401 to 900	901 to 1250
Minimum sheet thickness (mm)	6/10	8/10	10/10

- Maximum centre distance of support systems: 1 200 mm
- Density of Firespray® : 201kg/m³ ± 15%
- Inspection hatch possible for both horizontal and vertical ventilation (see photos 1 and 2)

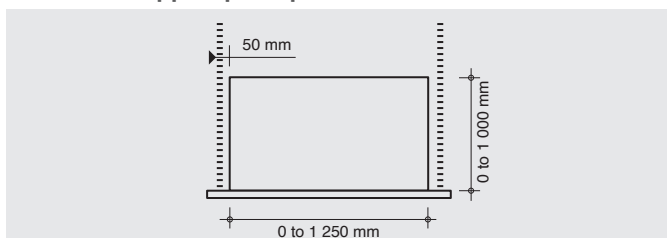
Duct assembly principle

The duct comprises sections with maximum length 1500mm. These sections are connected with galvanised steel profiles to the duct by welding and fixed together with M10 bolts. The sealing between the various sections is ensured by a self-adhesive seal, as well as by frame clamps positioned on the duct profiles. Internal reinforcements consist of steel stanchions, 17/21 mm (Ø int, Ø ext) positioned at mid-length of the sections (sketch 3) for ducts with height > 500mm.

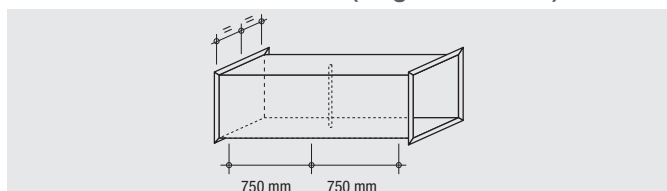
Sketch 1 - Duct assembly



Sketch 2 - Support principle



Sketch 3 - Duct reinforcement (height > 500 mm)



Support system for horizontal ducts (sketches 1, 2)
- 0x0mm to 1250x1000 mm: the duct is supported by suspension cradles distributed at a maximum centre distance of 1200 mm. Consisting of U-shaped cross members and two M10 threaded rod hangers.

Fire protection implementation principle

Protection of the duct body

- Firespray® is applied in a single layer, i.e. 56 mm in 60 min, 74 mm in 120 min.

Protection of support systems

- The crossbar is included in the protection of the duct body.
- Threaded rods are covered with a mesh and then sprayed with Firespray® to the same thickness as the duct or by means of a 30mm thick rockwool shell followed by a mesh and spraying of Firespray® (shell + sprayed product with the same thickness as that used on the duct).

Ducts tested as per NF / EN 1366-1 and NF / EN 1366-8 - Classification as per NF / EN 13501-4

Performance of horizontal and vertical rectangular smoke extraction ducts

Thickness of FIRESPRAY®	E	I	t	ve	ho	S	Operating pressure	Multi
57 mm	E	I	60	ve	ho	S	-1000 / +300 Pa	Multi
74 mm	E	I	120	ve	ho	S	-1000 / +300 Pa	Multi

Photo 1

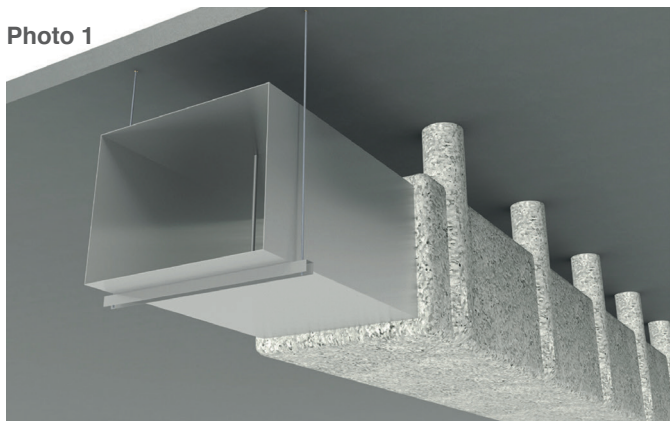
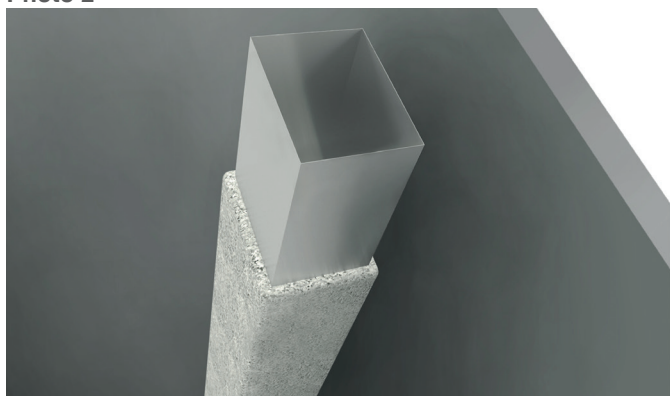


Photo 2



Application scope

- Horizontal and vertical rectangular ducts
- Sections 0x0mm to 1250x1000mm (w x H)
- Maximum length of sections: 1000 mm
- Sheet metal thickness of duct

Sheet metal length (mm)	≤ 400	401 to 800	801 to 1000	1001 to 1250
Minimum sheet thickness (mm)	6/10	8/10	10/10	12/10

- Maximum centre distance of the support systems: 975 mm
- Density of Firespray® : 201kg/m³ ± 15%

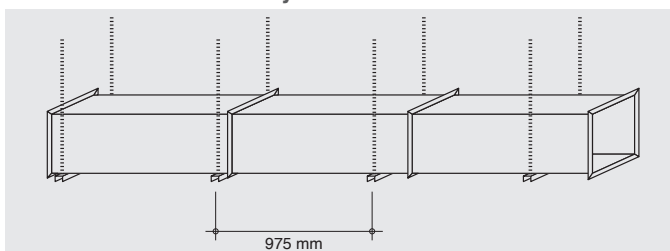
Duct assembly principle

The duct comprises sections of maximum length 1000mm. These sections are connected with galvanised steel profiles to the duct by welding and fixed together with M10 bolts. The sealing between the various sections is ensured by a self-adhesive seal, as well as by frame clamps positioned on the duct profiles.

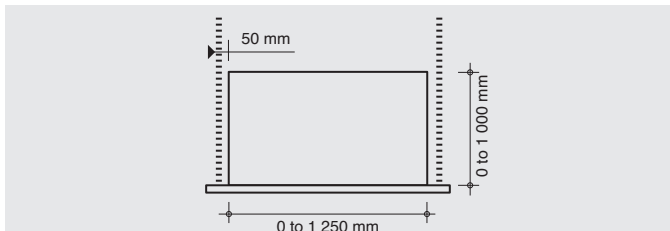
Internal reinforcements consist of steel stanchions, 17/21 mm (int. Ø, ext. Ø) positioned at max 500mm from each other (sketch 3) for duct heights > 500mm.

External reinforcements take the form of «U» shaped frames installed on the external section of the sections, distributed at a maximum distance of 500 mm from each other (sketch 3).

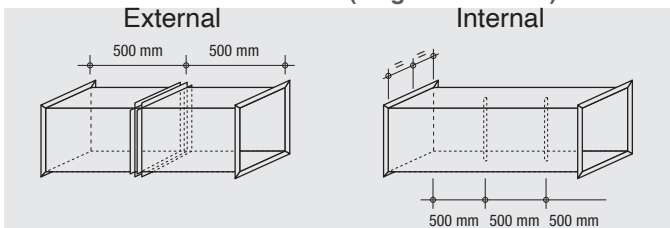
Sketch 1 - Duct assembly



Sketch 2 - Support principle



Sketch 3 - Duct reinforcement (height > 500 mm)



Fire protection implementation principle

Protection of the duct body

- Firespray® is applied in a single layer, i.e. 57 mm in 60 min, 74 mm in 120 min.

Protection of support systems

- Both the crossbar and the «U» are included in the protection of the duct body.
- Threaded rods are covered with a mesh and then sprayed with Firespray® to the same thickness as the duct or by means of a 30mm thick rockwool shell followed by a mesh and spraying of Firespray® (shell + sprayed product with the same thickness as that used on the duct).

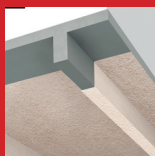
Projects in progress

Fireplaster®

Fire insulation - Concrete - Steel Structural floor tray - Cladding



Technical Datasheet - Fireplaster®



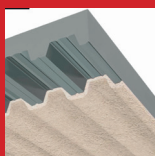
Fire protection of concrete structures with Fireplaster®



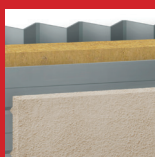
Fire protection of steel beams with Fireplaster®



Fire protection of steel columns with Fireplaster®



**Fire protection of structural steel floor trays
with Fireplaster®**



Fire protection of double-skin cladding with Fireplaster®

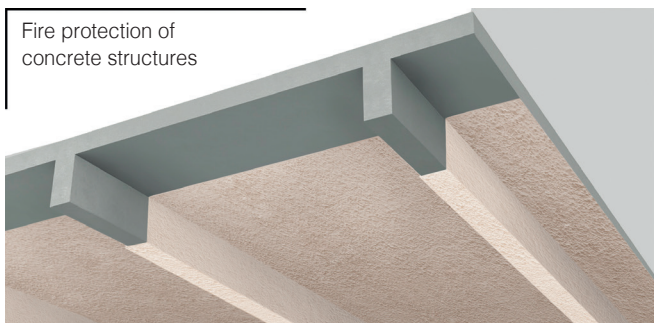


Acoustic correction with Fireplaster®

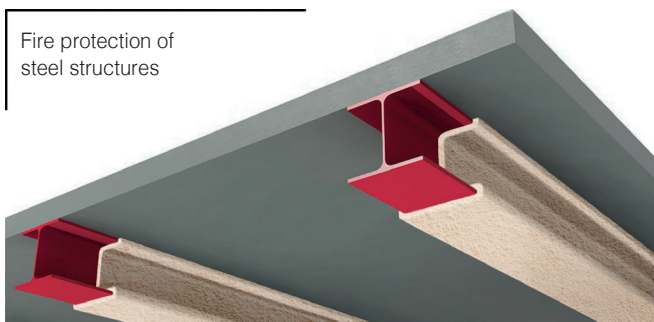
**Projects in
progress**

**Projects in
progress**

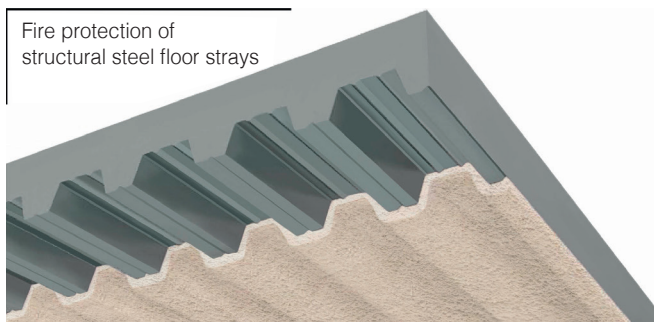
Fire protection of concrete structures



Fire protection of steel structures



Fire protection of structural steel floor trays



Fire protection of double skin cladding



Application scope

Acoustic correction
Fire protection



Product description

Fireplaster 270® is a spray-on powder mixture used for fire protection. The material is based on plaster, vermiculite and special additives

Applications

- Concrete floors and structures
- Steel structures
- Concrete slabs with structural steel floor trays
- Double-skin cladding

Properties and performance

- Rot-proof - Non-combustible
- Ease of implementation
- Performance: see the test report

Implementation

Refer to the reference reports and the installation rules specified in DTU 27.2.

Bonding primers

PROJISO FIXO B® (concrete) - PROJISO FIXO M® (metal)
PROJISO FIXO M+® (complex substrates)

Finish

Rough with a surface grain
Coloured with SIDAIRLESS®

Environment and safety

Refer to the Safety Data Sheet (FDS), available on request.
Do not discharge waste into drains, waterways or the ground.
Use the bin bags provided for this purpose.

Packaging and storage

- Storage period: 12 months maximum from the date of manufacture in unopened packaging.
- Storage conditions: protect from frost, moisture, excessive heat.
- Packaging: 20 kg plastic bag.
- Palletising: 24 bags per pallet i.e. 480 kg.

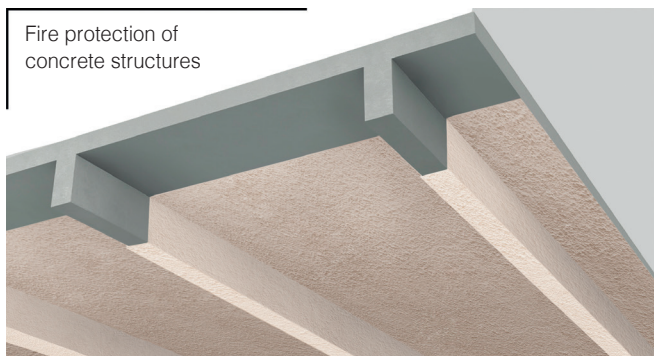
Characteristics

Colour	Off-white
Appearance	Granular
Density of the mortar	430 kg/m ³ ± 15 %
Consumption/m ²	From 3 to 3,5 kg/m ² /cm
Reaction to fire	A1
Ph	7
Initial setting time	2 hours at 20°C and 50% HR
Use temperature	From to 45°C
Setting mode	Hydraulic setting
Thermal conductivity	0,095 W/mK
VOC rating	A+
Other	FDES - CE Marking

The information given in this technical document is based on current tests and is assumed to be specific to the product, however, no guarantee of results is implied as the conditions of use are beyond our control.

R/REI 60 to 240

Fire protection of
concrete structures



Application scope

- Application on solid reinforced concrete elements
- Protection thickness for flat slabs or walls between 11 and 58 mm
- Protection thickness for rectangular beams between 16 and 67 mm
- Application on unsurfaced concrete structures poured with mineral oil or emulsion form release agents
- Application on flat slabs, rectangular beams, walls exposed on one side only
- Thickness of flat slabs – no minimum thickness
- Thickness of load-bearing walls - no minimum thickness
- Width of rectangular beams greater than or equal to 150 mm
- Can be finished with SIDAIRLESS®

Required thickness for the protection of reinforced concrete slabs designed according to EUROCODE EN 1992-1-2

Slab Thickness ≥ 120 mm Initial coating of any steel	Performance				
	REI 60	REI 90	REI 120	REI 180	REI 240
Minimum thickness of Fireplaster® (in mm)	11	11	11	18	22

Required thickness for the protection of reinforced concrete beams designed according to EUROCODE EN 1992-1-2

Beam on single supports Width ≥ 150 mm	Performance				
	R 60	R 90	R 120	R 180	R 240
Initial coating (in mm) on steel	0 10 20	0 10 20	0 10 20	0 10 20	0 10 20
Thickness of Fireplaster® (in mm)	16 16 16	16 16 16	16 16 16	29 26 26	37 37 37

Required thickness for the protection of reinforced concrete beams designed according to EUROCODE EN 1992-1-2

Continuous beam Width ≥ 150 mm	Performance				
	R 60	R 90	R 120	R 180	R 240
Initial coating (in mm) on steel	0 10 20	0 10 20	0 10 20	0 10 20	0 10 20
Thickness of Fireplaster® (in mm)	16 16 16	16 16 16	16 16 16	26 26 26	37 37 37

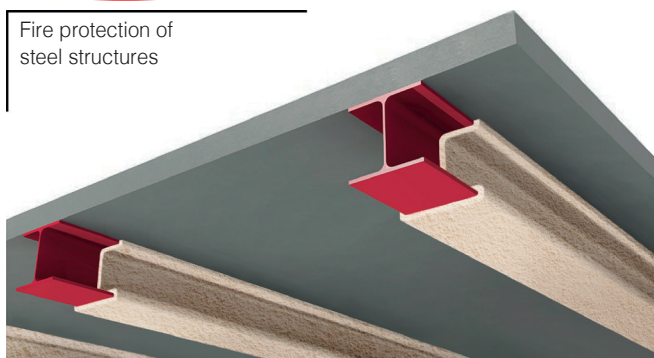
Required thickness for the protection of reinforced concrete load-bearing walls designed according to EUROCODE EN 1992-1-2

Wall exposed on a single side only Thickness ≥ 130 mm Initial coating of any steel	Performance				
	REI 60	REI 90	REI 120	REI 180	REI 240
Minimum thickness of Fireplaster® (in mm)	11	11	11	30	56

For any other implementation, please contact us.

R 30 to 240

Fire protection of steel structures



Beams exposed on 3 sides	R					
	30	60	90	120	180	240
HEA-100	10	17	26	35	52	64
HEA-120	10	17	25	34	52	64
HEA-140	10	16	25	34	51	63
HEA-160	10	15	24	32	49	62
HEA-180	10	15	24	32	49	62
HEA-200	10	15	23	32	49	62
HEA-220	10	14	23	31	48	61
HEA-240	10	13	21	29	45	59
HEA-260	10	13	21	29	45	59
HEA-280	10	12	20	28	44	58
HEA-300	10	12	19	27	42	57
HEA-320	10	11	18	26	41	56
HEA-340	10	11	18	26	41	56
HEA-360	10	10	17	24	39	54
HEA-400	10	10	17	24	39	54
HEA-450	10	10	16	23	35	51
HEA-500	10	10	16	23	35	51
HEA-550	10	10	16	23	35	51
HEA-600	10	10	14	21	33	48

Beams exposed on 3 sides	R					
	30	60	90	120	180	240
IPE- 80	11	20	30	40	59	HP
IPE-100	11	20	29	39	57	HP
IPE-120	11	19	29	38	57	HP
IPE-140	10	19	28	38	56	65
IPE-160	10	18	27	36	55	65
IPE-180	10	18	27	36	54	65
IPE-200	10	17	26	35	53	64
IPE-220	10	17	26	35	52	64
IPE-240	10	16	25	34	51	63
IPE-270	10	16	24	33	50	63
IPE-300	10	15	24	32	49	62
IPE-330	10	15	23	32	49	62
IPE-360	10	14	23	31	48	61
IPE-400	10	14	22	30	46	60
IPE-450	10	13	21	29	45	59
IPE-500	10	12	20	28	44	58
IPE-550	10	12	19	27	42	57
IPE-600	10	11	18	26	41	56

Beams exposed on 3 sides	R					
	30	60	90	120	180	240
UAP- 80	10	18	27	36	55	65
UAP-100	10	18	27	36	54	65
UAP-130	10	17	26	35	53	64
UAP-150	10	16	25	34	52	63
UAP-175	10	16	25	34	51	63
UAP-200	10	16	24	33	50	63
UAP-220	10	15	24	32	49	62
UAP-250	14	23	31	48	61	63
UAP-300	10	14	22	30	46	60

Application scope

- Application on untreated or rustproofed steel substrates; although our products do not promote corrosion of steel, a treated substrate (galvanisation or primer such as alkyd, epoxy, zinc rich epoxy or zinc silicate) is recommended for long-term corrosion resistance.
- Application on a clean, dry substrate, free of dust, mill scale, rust, oil and any other contaminants that may impair adhesion.
- Critical temperature: 570° C
- Can be finished with SIDAIRLESS®

Beams exposed on 3 sides	R					
	30	60	90	120	180	240
HEB-100	10	15	23	32	49	62
HEB-120	10	14	23	31	48	61
HEB-140	10	14	22	30	46	60
HEB-160	10	12	20	28	44	58
HEB-180	10	12	20	28	44	58
HEB-200	10	12	19	27	42	57
HEB-220	10	11	18	26	41	56
HEB-240	10	10	17	24	39	54
HEB-260	10	10	17	24	39	54
HEB-280	10	10	17	24	39	54
HEB-300	10	10	16	23	37	51
HEB-320	10	10	16	23	37	51
HEB-340	10	10	14	21	35	48
HEB-360	10	10	14	21	35	48
HEB-400	10	10	14	21	35	48
HEB-450	10	10	13	19	32	45
HEB-500	10	10	13	19	32	45
HEB-550	10	10	13	19	32	45
HEB-600	10	10	13	19	32	45

Beams exposed on 3 sides	R					
	30	60	90	120	180	240
IPN- 80	11	20	29	39	58	HP
IPN-100	10	19	29	38	56	65
IPN-120	10	18	27	36	55	65
IPN-140	10	17	26	35	53	64
IPN-160	10	17	25	34	52	64
IPN-180	10	16	24	33	49	63
IPN-200	10	15	24	32	49	62
IPN-220	10	15	23	32	49	62
IPN-240	10	14	23	31	48	61
IPN-260	10	13	21	29	45	59
IPN-280	10	12	20	28	44	58
IPN-300	10	12	20	28	44	58
IPN-320	10	12	19	27	42	57
IPN-340	10	11	18	26	41	56
IPN-360	10	10	17	24	39	54
IPN-380	10	10	17	24	39	54
IPN-400	10	10	16	23	37	51
IPN-450	10	10	14	21	35	48
IPN-500	10	10	14	21	35	48
IPN-550	10	10	13	19	32	45

Note: these thicknesses are in mm and have been calculated for a critical temperature of 570°C, for beams exposed on 3 sides.
For any other implementation, please contact us.

HP: Not in the report

R 30 to 240



Application scope

- Application on untreated or rustproofed steel substrates; although our products do not promote corrosion of steel, a treated substrate (galvanisation or primer such as alkyd, epoxy, zinc rich epoxy or zinc silicate) is recommended for long-term corrosion resistance.
- Application on a clean, dry substrate, free of dust, mill scale, rust, oil and any other contaminants that may impair adhesion.
- Critical temperature: 500° C
- Can be finished with SIDAIRLESS®

Columns exposed on 4 sides	R					
	30	60	90	120	180	240
HEA-100	10	20	30	39	58	65
HEA-120	10	20	29	39	58	65
HEA-140	10	19	29	38	57	65
HEA-160	10	18	28	37	55	64
HEA-180	10	18	28	37	55	64
HEA-200	10	18	27	36	54	64
HEA-220	10	17	26	35	53	63
HEA-240	10	16	25	33	51	62
HEA-260	10	16	25	33	51	62
HEA-280	10	16	24	32	49	61
HEA-300	10	15	23	31	48	60
HEA-320	10	14	22	30	46	59
HEA-340	10	14	22	30	46	59
HEA-360	10	13	21	29	44	57
HEA-400	10	13	21	29	44	57
HEA-450	10	12	20	27	42	56
HEA-500	10	12	20	27	42	56
HEA-550	10	12	20	27	42	56
HEA-600	10	11	18	25	40	54

Columns exposed on 4 sides	R					
	30	60	90	120	180	240
HEB-100	10	18	27	36	54	64
HEB-120	10	17	26	35	53	63
HEB-140	10	17	26	34	52	63
HEB-160	10	16	24	32	49	61
HEB-180	10	16	24	32	49	61
HEB-200	10	15	23	31	48	60
HEB-220	10	14	22	30	46	59
HEB-240	10	13	21	29	44	57
HEB-260	10	13	21	29	44	57
HEB-280	10	13	21	29	44	57
HEB-300	10	13	21	29	44	57
HEB-320	10	12	20	27	42	56
HEB-340	10	11	18	25	40	54
HEB-360	10	11	18	25	40	54
HEB-400	10	11	18	25	40	54
HEB-450	10	10	16	23	37	50
HEB-500	10	10	16	23	37	50
HEB-550	10	10	16	23	37	50
HEB-600	10	10	16	23	37	50

Columns exposed on 4 sides	R					
	30	60	90	120	180	240
IPE- 80	13	23	34	44	65	HP
IPE-100	12	23	33	43	64	HP
IPE-120	12	22	32	43	63	HP
IPE-140	12	22	32	42	62	HP
IPE-160	11	21	31	41	61	HP
IPE-180	11	21	31	41	60	HP
IPE-200	11	20	30	40	59	HP
IPE-220	10	20	30	39	58	65
IPE-240	10	19	29	38	57	65
IPE-270	10	19	28	37	56	65
IPE-300	10	18	28	37	55	64
IPE-330	10	18	27	36	54	64
IPE-360	10	17	26	35	53	63
IPE-400	10	17	26	34	52	63
IPE-450	10	16	25	33	51	62
IPE-500	10	16	24	32	49	61
IPE-550	10	15	23	31	48	60
IPE-600	10	14	22	30	46	59

Columns exposed on 4 sides	R					
	30	60	90	120	180	240
IPN- 80	12	23	33	44	64	HP
IPN-100	12	22	32	42	63	HP
IPN-120	11	21	31	41	61	HP
IPN-140	11	20	30	40	59	HP
IPN-160	10	20	29	39	58	65
IPN-180	10	19	28	37	56	65
IPN-200	10	18	28	37	55	64
IPN-220	10	18	27	36	54	64
IPN-240	10	17	26	35	53	63
IPN-260	10	16	25	33	51	62
IPN-280	10	16	24	32	49	61
IPN-300	10	16	24	32	49	61
IPN-320	10	15	23	31	48	60
IPN-340	10	14	22	30	46	59
IPN-360	10	13	21	29	44	57
IPN-380	10	13	21	29	44	57
IPN-400	10	12	20	27	42	56
IPN-450	10	11	18	25	40	54
IPN-500	10	11	18	25	40	54
IPN-550	10	10	16	23	37	50

Columns exposed on 4 sides	R					
	30	60	90	120	180	240
UAP- 80	11	21	31	41	61	HP
UAP-100	11	21	31	41	60	HP
UAP-130	11	20	30	40	59	HP
UAP-150	10	19	29	38	57	65
UAP-175	10	19	29	38	57	65
UAP-200	10	19	28	37	56	65
UAP-220	10	18	28	37	55	64
UAP-250	10	17	26	35	53	63
UAP-300	10	17	26	34	52	63

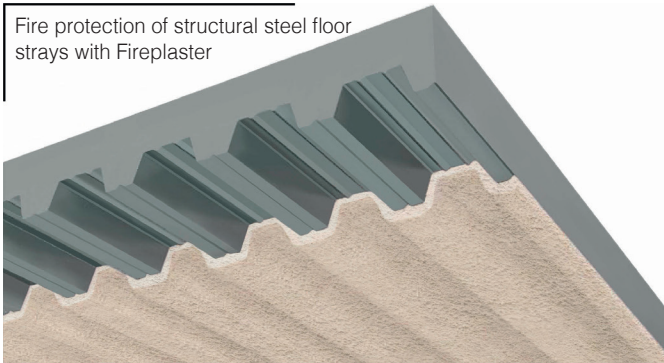


For rectangular and circular hollow pipes, please contact us.

HP: Not in the report

REI 30 to 360

Fire protection of structural steel floor trays with Fireplaster



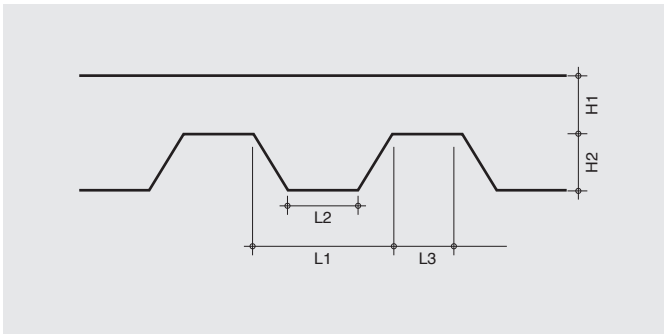
Application scope

- Protection thickness between 15 and 58 mm on trapezoidal structural steel floor trays
- Thickness of sheet metal for structural steel floor trays greater than or equal to 0.75 mm
- Width of the bottom of the corrugation (L2) of structural steel floor trays greater than or equal to 101 mm
- Corrugation height (H2) of structural steel floor trays greater than or equal to 58 mm
- Applicable on all composite slabs with trapezoidal structural steel floor trays, with effective thickness* greater than or equal to 83 mm
- Can be finished with SIDAIRLESS®

Assembly principle

- Cleaning of steel trays
- Application of the bonding primer
- Spraying of Fireplaster® in one or more passes to achieve the thickness required by the report

Figure 1



Required thickness on trapezoidal structural steel floor trays
(Figure 1)

REI	Thickness of Fireplaster®
30	15 mm
60	17 mm
90	21 mm
120	25 mm
180	34 mm
240	42 mm
360	58 mm

$$*Effective\ thickness = H1 + \frac{H2 \times (L1 + L2) / 2}{L1 + L3}$$

Fireplaster® - Test report: CSTB

Thickness of the Fibrexpand®	Substrate	Frequency in hertz																	α_w	
		100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000		5000
		Absorption coefficient α_s																		
45 mm calculated	Solid																			
35 mm calculated	Solid																			
25 mm calculated	Solid																			
15 mm calculated	Solid																			

Finishing product: Siderlaiss®

Projects in progress

Spraying accessories

Finish - adhesives - hardeners



Technical Datasheet - PROJISO FIXO B®



Technical Datasheet - PROJISO FIXO M®



Technical Datasheet - PROJISO FIXO DUR®



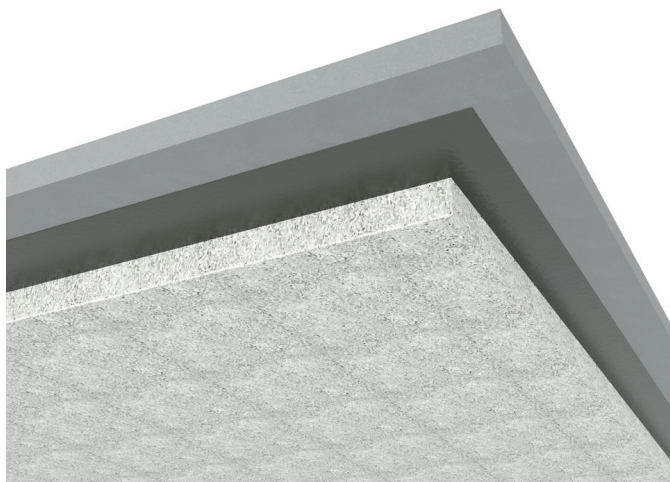
Technical Datasheet - SIDAIRLESS®



Technical Datasheet - FIXO M+®



Site Datasheet - FIBREXPAN®



Application scope

Bonding primer for concrete substrate



Description

PROJISO FIXO B® is a vinyl derivative solution with high molecular weight and a high degree of polymerisation. It is a primer for mineral fibre sprayed on concrete.

Implementation

PROJISO FIXO B® is applied with a brush, roller or low-pressure sprayer on a clean surface in good condition. The sprayed coating must be applied while the primer is still tacky.

Environment and safety

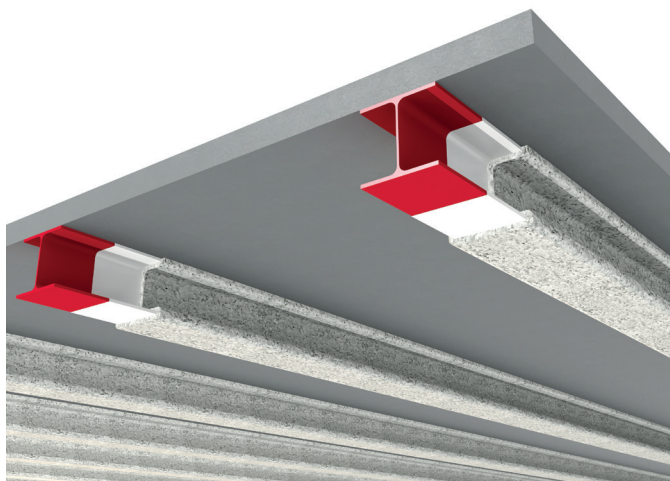
Refer to the Safety Data Sheet (FDS), available on request. Do not discharge waste into drains, waterways or the ground. Use the bin bags provided for this purpose.

Packaging and storage

- Storage: maximum 12 months in hermetically sealed original drums.
- Storage conditions: Store indoors under dry conditions, between 5 and 45 °C. Protect from frost.
- Packaging: 25 kg PE drums.
- Palletising: From 24 drums per pallet, i.e. 600 kg.

Characteristics	
Colour	Colourless
Specific gravity	1 ± 0,5 g/cm ³
pH	5
Dilution	Do not dilute
Consumption	Approx. 100 g/m ² May depend on substrate quality
Application temperature	5 to 45 °C
Film formation time	Approx. 30 minutes at 20 °C / 60 % HR
Drying time at 20 °C and 60 % HR	1 hour (touch dry) 3 to 4 days for complete drying
Brookfield viscosity at 25 °C	280-380 cps
Number of layers	NA
Setting mode	Air drying
Reaction to fire	NA
VOC rating	A+

The information given in this technical document is based on current tests and is assumed to be product specific. However, no guarantee of results is implied, as the conditions of use are beyond our control.



Application scope

Bonding primer for metal substrate



Description

PROJISO FIXO M® is an aqueous dispersion of a styrene butadiene copolymer. It is a synthetic adhesive designed to bond mineral fibre sprayed onto a metal substrate.

Implementation

PROJISO FIXO M® is applied with a brush, roller or low-pressure sprayer on a clean surface in good condition. The sprayed coating must be applied while the primer is still tacky.

Environment and safety

Refer to the Safety Data Sheet (FDS), available on request. Do not discharge waste into drains, waterways or the ground. Use the bin bags provided for this purpose.

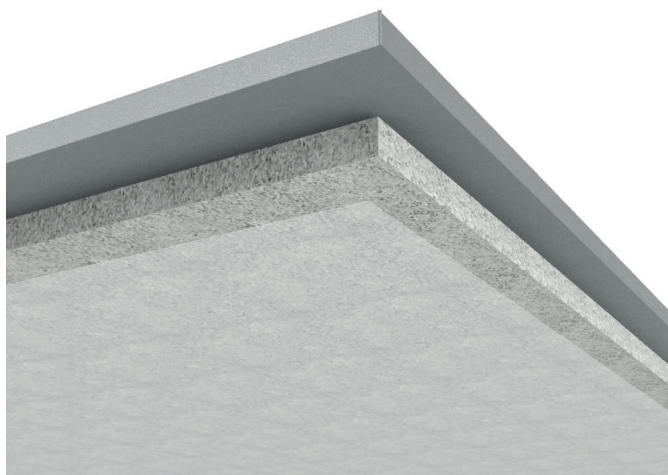
Packaging and storage

- Storage: maximum 12 months in hermetically sealed original drums.
- Storage conditions: Store indoors under dry conditions, between 5 and 45 °C. Protect from frost.
- Packaging: 25 kg PE drums.
- Palletising: 24 drums per pallet, i.e. 600 kg.

Characteristics

Colour	Milky white
Specific gravity	1,15 ±0,05 g/cm³
pH	7
Dilution	Do not dilute
Consumption	200 to 250 g/m²
Application temperature	between 5 and 45 °C
Film formation time	Approx. 45 minutes at 20 °C / 60 % HR
Drying time at 20 °C	6 hours (touch dry)
and 60 % HR	3 to 4 days for complete drying
Brookfield viscosity at 25 °C	1600 - 2200 cps
Number of layers	NA
Setting mode	Air drying
Reaction to fire	NA
VOC rating	A+

The information given in this technical document is based on current tests and is assumed to be product specific. However, no guarantee of results is implied, as the conditions of use are beyond our control.



Application scope

Hardener for fibrous coatings



Description

PROJISO FIXO DUR® is a complex mixture of silicates and acrylic copolymers in the water phase.

Properties and performance

PROJISO FIXO DUR® acts by impregnation and its original formula combined with its particularly low viscosity (approx. 4 to 6 cps) means that it can penetrate up to 15 mm into the fibrous covering. It does not affect the acoustic or fire protection qualities of the fibrous covering.

Implementation

Shake well before use.

Depending on the desired results, apply PROJISO FIXO DUR® hardener by pneumatic spraying between 1 and 2 kg/m² directly onto the fibres (wet or dry).

Environment and safety

Refer to the Safety Data Sheet (FDS), available on request.

Do not discharge waste into drains, waterways or the ground. Use the bin bags provided for this purpose.

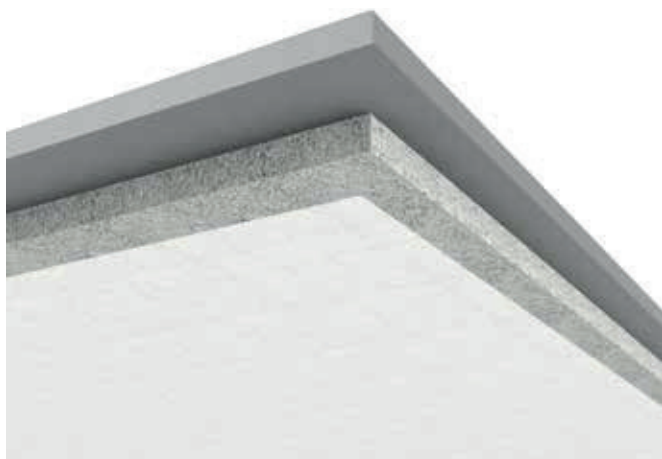
Packaging and storage

- Storage: maximum 12 months in hermetically sealed original drums.
- Storage conditions: Store indoors under dry conditions, between 5 and 45 °C. Protect from frost.
- Packaging: 25 kg PE drums
- Palletising: 24 drums per pallet, i.e. 600 kg.

Characteristics

Colour	White
Specific gravity	1,1 ± 0,5 g/cm ³
pH	12
Dilution	Do not dilute
Coloration	None
Consumption	1 to 2 kg/m ²
Application temperature	5 to 45 °C
Drying time at 20 °C	8 hours (touch dry)
and 60 % HR	48 hours to be fully dry
Brookfield viscosity at 25 °C	4 to 6 cps
Number of layers	NA
Setting mode	NA
Reaction to fire	NA
VOC rating	A+

The information given in this technical document is based on current tests and is assumed to be product specific. However, no guarantee of results is implied, as the conditions of use are beyond our control.



Application scope

Finishing coat for fibrous and plaster coatings.



Description

SIDAIRLESS® is an aqueous dispersion of vinyl copolymers with inert mineral fillers. It is a fine, ready-to-use coating, specially designed for the surfacing and mechanical reinforcement of fibrous coatings.

Properties and performance

Substrates consisting of fibrous sprayed plasters conforming to DTU 27.1 and sprayed mortar plasters conforming to DTU 27.2.

Implementation

SIDAIRLESS is delivered ready to use (without mixing or diluting). The product is spray-applied using Airless plaster pumps with a minimum flow rate of 5.6 L/min and with nozzles from 25 to 29.

The product is applied to a fibrous or semi-solid coating that has dried for at least 48 hours (at 20°C and 60% RH).

Do not apply below 5°C, or at a humidity level above 65%, or on heated surfaces.

The application rate is approx.. 100 m²/h.

Colouring in pastel shades can be done directly on site. Option of using a concentrated universal dye. Mixing can be done with a mixing turbine for mortars. It is advisable to carry out a colour test.

Other types of colouring can be developed during the production process, please consult us.

Environment and safety

Refer to the Safety Data Sheet (FDS), available on request.

Do not discharge waste into drains, waterways or the ground. Use the bin bags provided for this purpose.

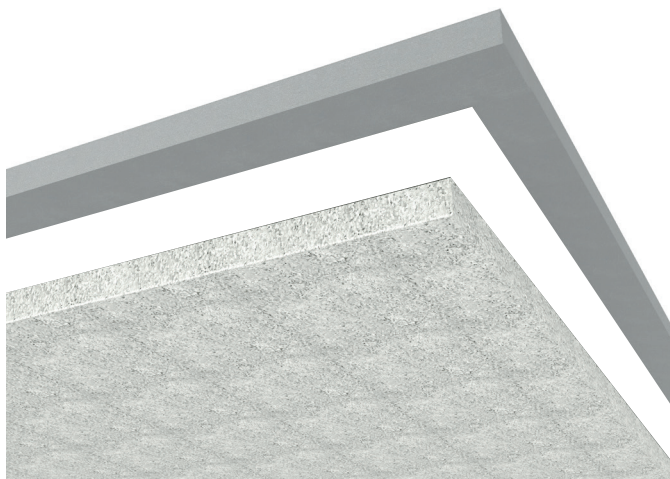
Packaging and storage

- Storage: maximum 9 months in hermetically sealed original drums.
- Storage conditions: Store indoors under dry conditions, between 5 and 30 °C. Protect from frost.
- Packaging: 25 kg PE drums.
- Palletising: 33 drums per pallet, i.e. 825 kg.

Characteristics

Colour	Brilliant white or tinted
Specific gravity	1,60 ± 0,1 g/cm ³
pH	8,5 ± 0,5
Dilution	Do not dilute
Coloration	On site or in production
Consumption	0,7 à 2 kg/m ² depending on substrate quality
Application temperature	5 to 30 °C
Drying time at 20 °C and 60 % HR	12 hours/mm
Brookfield viscosity at 25 °C	78 000 to 82 000 cps
Number of layers	NA
Setting mode	NA
Reaction to fire	A1

The information given in this technical document is based on current tests and is assumed to be product specific. However, no guarantee of results is implied, as the conditions of use are beyond our control.



Application scope

High performance bonding primer



Description

PROJISO FIXO M+® is an aqueous emulsion primer based on modified acrylic copolymers and highly adhesive additives for metal and concrete substrates.

It takes the form of a film which retains its flexibility even at low temperatures and which, when applied to a metal surface, does not cause any flash rusting.

Suitable as an adhesive primer for fibrous and semi-solid coatings, it retains a sticky feel indefinitely.

Implementation

The surface to be treated must be thoroughly cleaned; on metal surfaces, remove all traces of rust, scale or dirt. Concrete surfaces must be cleaned and cleared of any efflorescence of saltpetre, etc.

The product is ready for use. It is generally applied by pneumatically spraying and pre-bonding the concrete or steel substrate intended to receive the determined thickness of mineral fibre. It is advisable to apply a quantity of PROJISO FIXO M+® of 0.1kg/m², on a metal substrate and 0.2kg/m² on concrete. It can be applied at temperatures above 5°C. Tools should be cleaned with water immediately after use.

Environment and safety

Refer to the Safety Data Sheet (FDS), available on request.

Do not discharge waste into drains, waterways or the ground.

Use the bin bags provided for this purpose.

Packaging and storage

- Storage: maximum 12 months in hermetically sealed original drums.
- Storage conditions: Store indoors under dry conditions, between 5 and 45 °C. Protect from frost.
- Packaging: 25 kg drums.
- Palletising: From 24 drums per pallet, i.e. 600 kg.

Characteristics	
Colour	White
Specific gravity	1,05 ± 0,05 g/cm ³
pH	7/8
Dilution	Do not dilute
Application temperature	5 to 45 °C
Brookfield viscosity at 25 °C	2600 - 3600 cps
Film formation time	Approx. 1 hour at 20 °C / 60% RH
Drying time at 20 °C and 60 % HR	1 hour (touch dry) 3 to 4 days to be fully dry

The information given in this technical document is based on current tests and is assumed to be product specific. However, no guarantee of results is implied, as the conditions of use are beyond our control.

Site reference:

Quotation reference:

CONFORM TO DTU 27.1

Name of the spraying company:

THE SITE

Site address:

Post code:

City:

Nature of the works: ☐ New ☐ Renovation

Nature of the substrate: ☐ Concrete ☐ Steel ☐ Wood ☐ Other

If other, specify:

IMPLEMENTATION

Insulation product brand name: FIBREXPAN® Bag weight: 20 kg

Product reference: FIBREXPAN®

Manufacturer's name: Projiso

ACERMI certificate number:

Bonding primer: ☐ Brand name:

Bonding framework: ☐

Finishing coat: ☐ Brand name:

TESTING OF MACHINE SETTINGS

Recap of machine setting tests: sprayed area for 10 bags

SECTION 1: IMPLEMENTATION REPORT

Sprayed surface area: m²

Average thickness measured after finishing (flat surfaces): mm

Average thickness measured after finishing (beams): mm

Quantity used: Bonding primer: kg

Insulation product: kg

Finishing coat: kg

Thermal Resistance (flat surfaces): planned installed

Thermal Resistance (beams): planned installed

DESIGN APPLICATOR

Company:

Spraying start date: / /

Spraying end date: / /

Company stamp and signature:

PRINCIPAL

Company:

Company stamp and signature:

Name: Name:

Job title: Job title:

SECTION 2: DETAILS OF MACHINE SETTINGS TESTS

Machine brand name:

Machine serial number:

Insulation product brand name: FIBREXPAN®

Product reference: FIBREXPAN®

Manufacturer's name: Projiso

Bag weight: 20 kg

Batch number

Bag n°1

Bag n°2

Bag n°3

Bag n°4

Bag n°5

Bag n°6

Bag n°7

Bag n°8

Bag n°9

Bag n°10

Sprayed area for 10 bags:m²

Number of thickness measurements: 25

Thickness measurement record - machine setting test

mm	1	2	3	4	5	Total
A						
B						
C						
D						
E						
Total						

Average thickness measured after finishing = Total / 25 = mm

Consumption:

Calculation of the number of bags per 100 m² = 1000 / sprayed area for 10 bags:

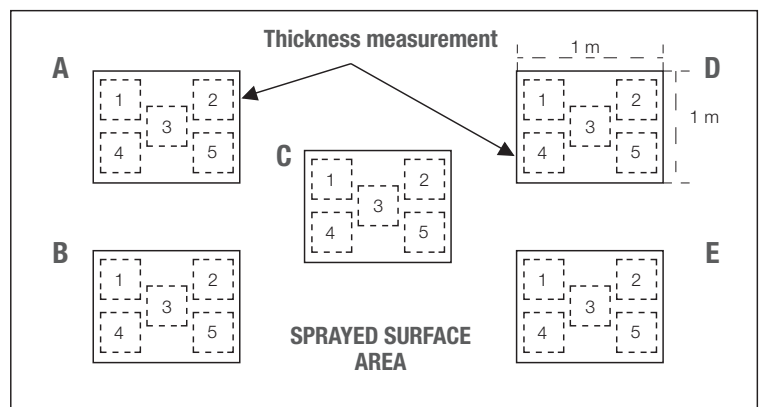
The average thickness measured and the consumption must match the values shown on the ACERMI label.

If not, repeat the procedure.

Thickness measurement method (flat surface)

Number of measurements required for 10 sprayed bags:

25 = 5 sections of 5 measurements



Site reference:

General terms and conditions of sale valid from 01/06/2016

Any order of products implies the buyer's unreserved acceptance of and adherence to these general terms and conditions of sale, which prevail over any other document of the buyer and in particular over any general terms and conditions of purchase, unless expressly agreed otherwise in advance by our company.

1. Sales

1.1 Our sales are made under the conditions of tariffs and quantities in force at the time of the order, except in circumstances beyond our control, and except for deferred or staggered deliveries, in which case our sales are made under the conditions of the tariffs in force at the time of delivery.

Our sales are only definitively valid after our order acknowledgements have been sent. Orders can no longer be modified or cancelled 48 hours before delivery; after this time, they will be firm and definitive.

Our tariff applies to all our customers on the same date. This may be revised upwards during the year, after prior information to our clients. Any modification will be applicable on the date indicated on the new tariff.

1.2 The transfer of ownership of our products is suspended until full payment of the price of said products by the customer, in principal and accessories, even in cases where payment terms have been granted.

Payment is understood as the effective receipt of the price by our company. Any clause to the contrary, in particular in the general terms and conditions of purchase, shall be deemed unwritten.

Our company may enforce its rights under this retention of title clause, for any of its claims, on all of its products in the customer's possession, with no prejudice to its right to request the cancellation of sales in progress.

The customer shall ensure that the goods delivered are identifiable in their stock and kept in strict compliance with the conditions relating to these products. They shall insure said products against all risks, this clause in no way prohibiting the transfer of risks to the buyer upon delivery.

In the event of damage to or disappearance of the goods, prior to the transfer of ownership, the payments from the customer's insurance company shall accrue to our company, notwithstanding the exercise of any other recourse by our company against the customer.

Following formal notice, our company may unilaterally draw up or have drawn up an inventory of its products in the possession of the client, who agrees, from now on, to allow free access to its warehouses, shops or others for this purpose. The goods must be returned to our company immediately, at the customer's expense and risk, even in cases of force majeure, an act of God or the act by a third party.

The reclamation of our goods does not relieve the customer of their obligation to pay the price immediately in principal or accessories. Our company is therefore entitled to continue execution of the sale, even after having taken possession of the goods, unless it prefers to request the cancellation of the sale. In the latter case, any advance payments already made will be retained by our company with no prejudice to any other damages. In the event of seizure, the customer shall immediately inform our company.

In general, the customer shall be obliged to oppose by all legal means any pretensions, threats, actions, procedures or any other measure that may call into question the seller's right of ownership that third parties may be led to assert over the goods sold. They will immediately notify the seller to enable them to safeguard their interests.

2. Deliveries and warranties

2.1 Delivery times are given for information only due to the availability of carriers and the order in which orders are placed. However, the buyer may request the cancellation of their order if the goods are not delivered within 60 days of a formal notice that has remained without effect, it being understood that this formal notice may only be made after the indicated delivery date, and that delays do not entitle the customer to cancel the sale, to refuse the goods or to claim damages.

2.2 In accordance with the provisions of articles 1641 et seq. of the Civil Code, the seller is bound by the guarantee of hidden defects of the product sold.

2.3 The company's contractual warranty is limited to the replacement by simple exchange of any part recognised as defective due to a manufacturing defect established by both parties. It takes effect from the delivery of the goods.

2.4 Any use of our goods for a purpose other than that for which they were manufactured fully discharges our liability. The same applies in the event of modification of the goods by third parties or in the event of alteration due to deficient storage, transport or handling conditions.

2.5 With the exception of those that may implicate the carrier, any declaration of any nature whatsoever will only be accepted if it is made within eight days of the goods being made available, by registered letter with acknowledgement of receipt.

3. Shipments

3.1 Irrespective of the destination of the goods and the conditions of sale (including free sales), delivery is effected by handing over the goods to the customer or to their carrier or to the carrier chosen by our order company and on behalf of the customer.

3.2 The transfer of risk takes place at the time of delivery. Consequently, the goods travel at the risk of the customers who are responsible, at reception, for issuing the full, detailed reservations on the transport document, and then for confirming these reservations to the carrier by registered letter with acknowledgement of receipt within three days of goods reception in accordance with the provisions of article L.133-3 of the Code of Trade. Our company will not be liable in any way for damage or loss during transport operations.

3.3 Any other complaint concerning nonconformity of the delivery with the order shall, in order to be valid, be addressed to our company by fax or registered letter with acknowledgement of receipt within eight days of the aforementioned delivery date. This complaint shall be accompanied by the delivery note. No returns will be made without the prior written consent of our company. In the event of an accepted complaint, the liability of our company is strictly limited to the obligation to replace the non-conforming goods to the exclusion of all damages.

Any complaint addressed to our company outside the aforementioned period will be deemed null and void and the delivered goods will be irrefutably deemed to conform to the order.

3.4 If goods ready in our factories are not collected by the customer or the carrier acting on his behalf within 15 days of a fax reminding them of the obligation to collect the goods, the customer shall be solely responsible for any damage to the goods.

3.5 Notwithstanding the acceptance by our company to bear the cost of transport, the cost of delivery by road of the goods to the home or building site indicated by the customer shall nevertheless be borne by the customer when these places are inaccessible by normally used vehicles (article 4 of the general conditions of application of road haulage tariffs for goods).

4. Payment

4.1 Our invoices are payable in cash, except under special conditions. This deadline shall be understood as the deadline for the actual collection of the payment and not as the deadline for the receipt of the means of payment.

Should the customer request to make an advance payment, we reserve the right, depending on the customer's financial situation, to set the payment deadline, within the limits of and in compliance with the law on payment deadlines, an overdraft ceiling and to request guarantees. Any new information that modifies our assessment of the risk may justify, at any time, the requirement of a cash payment or new guarantees. No discount will be granted for early payment.

Payments should be sent to PROJISO, Service comptabilité, 41 rue Paul Vaillant Couturier 03100 Montluçon.

4.2 Failure to pay on the due date shall render our entire claim immediately payable by forfeiture of the term.

Penalties for late payment, applicable without the need for a reminder, as well as a fixed indemnity for collection costs shall be payable by law on the day following the date of payment shown on the invoice, in the event that the sums due are paid after this date. This rate is equal to the key rate of the European Central Bank in force on the first day of the half-year in question, plus 10 points. The amount of the fixed compensation for collection costs is set at 40 euros. Additional compensation may be claimed when the collection costs incurred are higher than the amount of this fixed indemnity on justification.

4.3 In addition, we reserve the right to suspend or cancel pending orders, even if accepted, without prejudice to any other remedy.

4.4 Any delay in delivery or any claim whatsoever and at whatsoever time shall not modify the terms and conditions of payment.

5. Force majeure

Events beyond our control shall be considered as force majeure or fortuitous events, insofar as their occurrence makes the fulfilment of obligations completely impossible. In particular, the following are considered to be cases of force majeure or fortuitous events discharging our responsibility: strikes, fire, flooding, war, production stoppages due to fortuitous breakdowns, epidemics, roadblocks, supply shortages not attributable to our company. Our company will inform the customer as soon as possible of the occurrence of one of the events listed above and will endeavour to remove the effects as soon as possible. However, if the execution of an order appears to us to be definitively compromised, our company shall be entitled to cancel it purely and simply without being held liable.

6. Tolerance

The supplies are made with the usual tolerances in terms of quality, quantity, dimensions, thickness and weight, which is expressly accepted by the customer without the latter being able to invoke a reconsideration of the order or a modification of the prices.

7. Resolutive clause

In the event of non-performance by the customer of any of its obligations, and 8 days after a formal notice by registered letter with acknowledgement of receipt has remained wholly or partly without effect during this period, the sales contract shall be terminated automatically and without formalities. The goods shall then be returned at the first request of our company at the expense, risk and peril of the customer, who is obliged to do so, with no prejudice to any damages due to our company. Any deposit already paid will be forfeited as initial compensation.

8. Miscellaneous

Purchasers may not sell our products, either directly or indirectly, to other manufacturers of similar products, or under names other than our registered trademarks, without our approval.

9. Intellectual property rights

All technical and/or commercial documents given to the client remain the exclusive and full property of our company, which is the sole owner of the intellectual property rights on these documents. The latter may only be used in connection with the performance of the service requested. The customer shall refrain from any exploitation, except with the express prior consent of our company. All the documents transmitted, as well as any reproductions, will be returned to our company on request and in any case at the end of the service.

10. Jurisdiction

Any dispute will be brought before the courts of Montluçon, which the sellers and buyers acknowledge to be exclusively competent, notwithstanding any stipulation to the contrary, even in the event of a warranty claim.

N.B. We reserve the right to change our terms and conditions without notice.



MANUFACTURER OF SPRAY-ON INSULATION

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