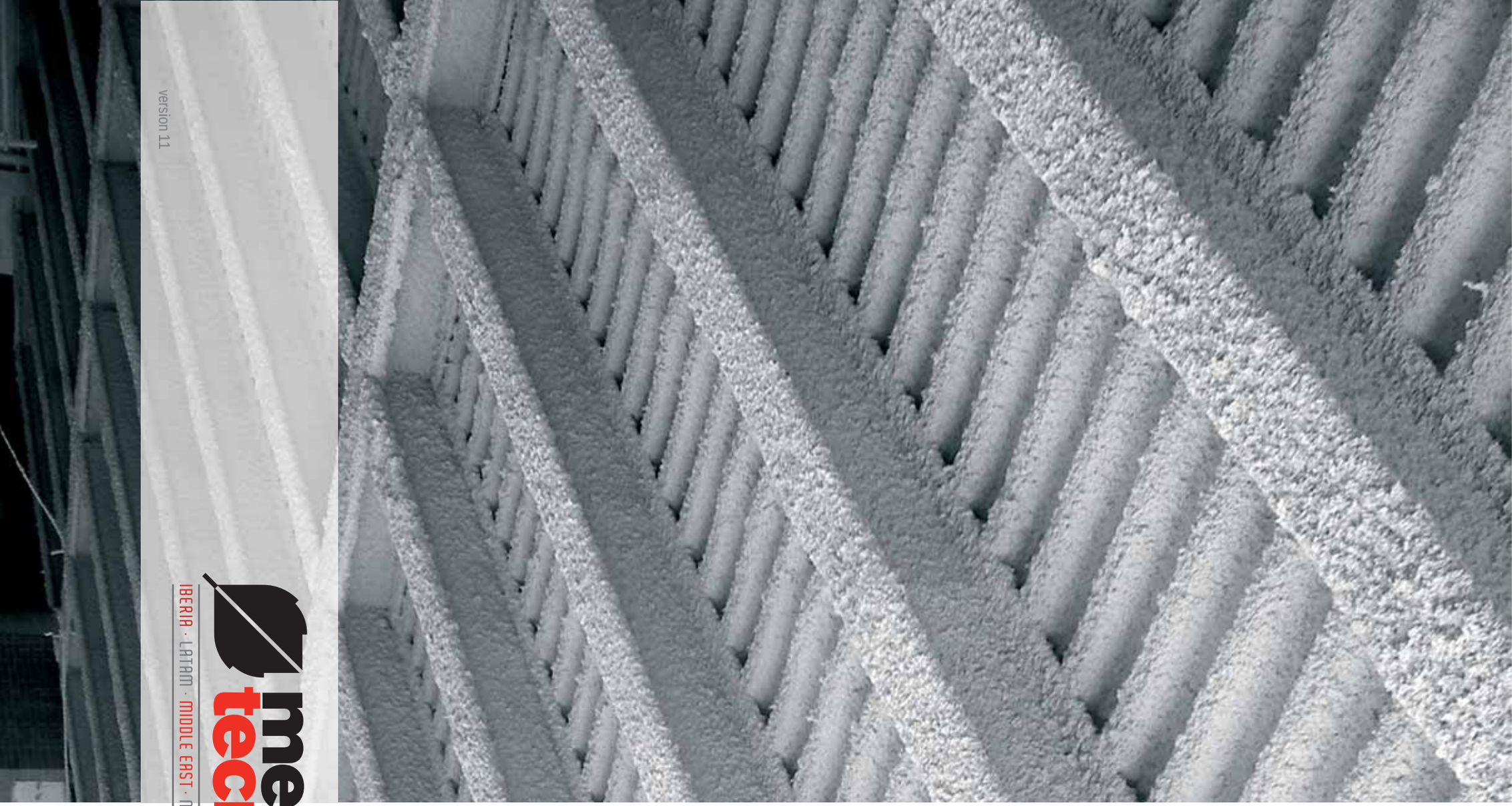

version 11

mercor tecresa®

IBERIA · LATAM · MIDDLE EAST · NORTH AFRICA · TURKEY

TECWOOL® F: • STEELWORK PROTECTION • REINFORCED CONCRETE PROTECTION • CARBON FIBRE PROTECTION IN STRUCTURES • CONCRETE / PROFILED STEEL SHEET MIXED ELEMENTS' PROTECTION • CERAMIC BLOCK AND WOODEN BEAMS SLAB STRUCTURE • GALVANIZED DUCT PROTECTION • FIRE BELT BARRIER SYSTEM / ROOF FIREBREAK • DIVIDING WALL / ROOF FIRBREAK • TUNNEL PROTECTION • **TECWOOL® T:** • VENTILATED FACADE • SLAB STRUCTURES AND WALLS OF PREMISES AN CAR PARKS • **TECWOOL® 825:** • STEELWORK PROTECTION • TUNNEL PROTECTION

TECWOOL® MORTAR

BUILDING SOLUTIONS FOR YOUR SAFETY

Tecresa Protección Pasiva®, a Spanish company established on 24 July 1998, has been part of the **Mercor® Group** since 19 February 2008. It was originally created to offer, both the national and international market, cutting edge comprehensive solutions for passive protection against fire, focusing on two areas: Smoke vents and materials resistance with products made on our premises, such as the **Tecwool®** mortar or **Tecbor®** boards.

Our main objective is to meet the needs of the current, competitive and ever-changing market providing not only solutions to the development and marketing of fire protection materials but also a wider approach to enable customers to optimise their management, which is a key to competitiveness.

In recent years, **mercor tecresa®** has consolidated its leadership in the sector due to its commitment, technology and development of fire prevention systems.

The company policy is based on a continuous improvement of the production capacity, with a permanent focus on service quality and customer satisfaction. Thus, it has been the first quality certified company in the passive protection sector in compliance with standard ISO 9001:2008 and ISO 14001:2004 by Applus. Regarding occupational risk prevention, it has complied with standard OHSAS 18001:2007.

Mercor tecresa® is in continuous evolution and development, striving to improve every day the service we offer to our customers.

LEGEND

Fire protection.

Thermal insulation.

Acoustic absorption.

Fire protection for industrial appliances and tunnels.

Application and general usage.

Reference works.

TECWOOL® MORTAR

TECWOOL® F

TECWOOL® T

TECWOOL® 825

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tecresa
Mortero / Mortar / Mortier
TECWOOL®
TECWOOL® F & T & TECFILL
Protección contra el fuego.
Fire protection.
Protection incendie.
Aislamiento térmico.
Thermal insulation.
Isolement thermique.
Absorción acústica.
Acoustic absorption.
Absorption acoustique.
TECWOOL® 825
Protección contra el fuego en industria y túneles.
Fire protection for industrial applications and tunnels.
Protection contre le feu dans l'industrie et les tunnels.
TECWOOL® F
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TECFILL®
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TECWOOL®

GENERAL CHARACTERISTICS OF OUR MORTARS

COMPOSITION

Tecwool® mortars, manufactured by **mercor tecresa®**, are a combination of rock wool with cement as unique hydraulic binder and other additives in smaller amounts added during production.

TESTS

Mercor tecresa® constantly evolves and adapts to changes in standards, developing new tests in official labs certified by ENAC or other similar international entities and pursuant to UNE EN, ASTM, etc.

FIRE REACTION

Fireproof pursuant to European standard UNE EN 13501. Euroclass A1.

TRACEABILITY

All of our products undergo an internal quality control that provides a guaranteed knowledge of the history, location and path of our batches.

QUALITY

Commitment to and effort in the creation of a market leading product, certified by Applus pursuant to standard ISO 9001.

Tecwool® F is the first rockwool mortar to obtain the CE mark with the DITE 11/0185 number.

HEALTH AND SAFETY

Tecwool® is manufactured with inorganic components such as rock wool, classified according to European Directive 67/548/EEC as Xi; R-38 (health risk-free). Likewise, it is neither toxic nor pathogenic; it contains no free asbestos or crystalline silica; and it is not affected by fungi growth.

TECHNICAL ASSISTANCE

Our sales department, through its technicians, offers personalized advice both constructive solutions as implementing Normative.

FINISHINGS

Rugged or smooth finishing can be obtained due to the product's versatility. An acrylic coating can be applied over the mortar to obtain a decorative finishing

APPLICATION

Tecwool® is applied a by pneumatic spraying machine. Easy, quick and economic.

GLOBALIZATION

Either directly or through the **Group Mercor®** brands, **Tecresa** markets its products all around the world, with the purpose of being the reference point in the passive fire protection market.

TECWOOL® F

Fire protection.

Thermal insulation.

Acoustic absorption.

Passive Protection against Fire

Tecwool® F is a rock wool and cement spread mortar, manufactured by **mercor tecresa®** specifically engineered for fire protection of all types of building structures and faces.

Several reaction and resistance tests, performed in official labs, present **Tecwool® F** as the perfect complement for making a construction element fire resistant.

Tecwool® F adapts to a wide variety of supports, even when exposed to settlement vibrations or movements. No cracking or crazing as a result of its perfect adherence and flexibility.

Besides providing great fire resistance, **Tecwool® F** features exceptional characteristics regarding sound and acoustic absorption in reverberation room.

Lastly, the mortar acts as an excellent thermal insulator thanks to its thermal conductivity value.

TECHNICAL CHARACTERISTICS AND SPECIFICATIONS

Composition	Cement, rock wool and additives	
Fire reaction	Fireproof/ Euroclass A1	EN 13501-1
Bulk mortar density	250 Kg/m³ ± 10%	ISO 3049
Hardened mortar apparent density	328 Kg/m³ ± 10%	EN 1015-10
Fresh mortar apparent density	464 Kg/m³ ± 10%	
Thermal conductivity	0,061 W/mk	EN 12667 EN ISO 10456
Alkalinity (pH value)	12,4	
Bulk product, dried at 105°C	0,68% of H_2O	
Steam permeability	2,1 (μ)	UNE EN ISO 12572 5.6.2 ETAG 018-1
Resistance to fungi	Immune	
Protection against steel corrosion	Yes	
Flexural strength	0,15 Mpa (28 days)	EN 1015-11
Crushing strength	0,19 Mpa (28 days)	EN 1015-11
Wind erosion resistance	15 m/s β=90° y β= 15°	
Toxic/Pathogenic	No	
Free crystalline silica asbestos	No	
Weighted sound absorption ratio (25 mm)	∝w=0,8 (H) Class C	EN ISO 354 EN ISO 11654
Acoustic absorption class (15 mm)	∝w=0,6 (H) Class B	EN ISO 354 EN ISO 11654
Adherence	0,011 N/mm² failure	EGOLF SM5
Intended use category	Z_1, Z_2 Internal use	
Marketing	25 kg sacks in 600 kg pallets	
Useful life of the material	25 years	Dite 11/0185

1. STEELWORK PROTECTION

until R 240

Fire Resistance of Structural Members

Steel structures are a construction system used worldwide.

One of the main advantages is that they have great resistance per weight unit, which provides them with tremendous versatility and the possibility of creating complex yet light structures.

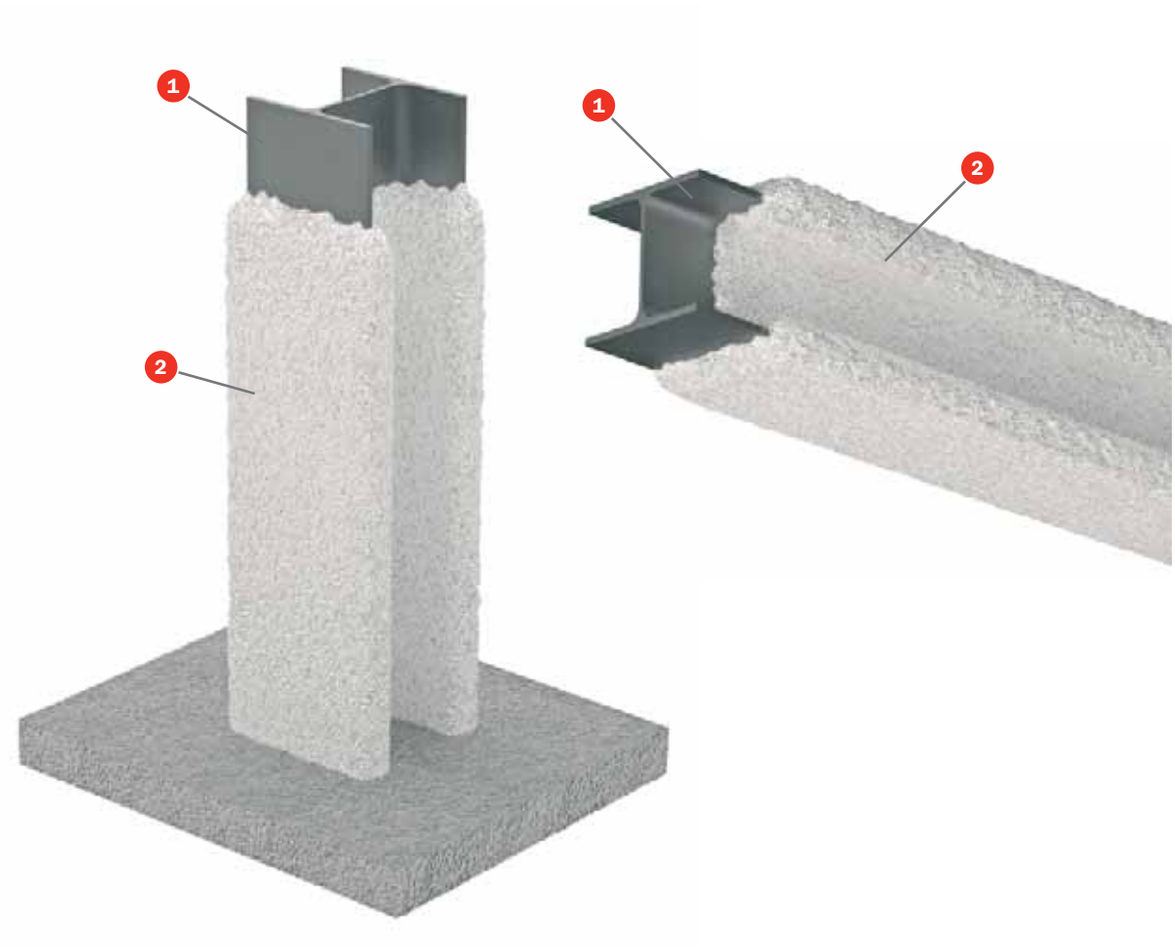
By contrast, one of the drawbacks of steel is its high thermal conductivity. Therefore, in the event of a fire, the progressive increase in temperature plus steel high heat transmission result in a reduction of the structure's bearing capacity and mechanical resistance. The resistance and elastic limit are modified after 250 °C, and after approximately 500 °C the drop in resistance is significant enough so as not to support its design capacity.

To avoid this, **mercor tecresa®** introduces **Tecwool® F** mortar, tested pursuant to standard UNE ENV 13381-4 to determine the mortar fire protection properties when applied to steel structural elements: beams, pillars or tension members.

Tecwool® F has been designed and tested to cover a great variety of steel profiles characterised by their section factors. Likewise, it is tested for several design temperatures specified in the standard.

COLUMN

BEAM



TESTS

Standard: UNE ENV 13381-4

Laboratory: APPLUS
Test No: 08/32302469

Laboratory: FIRES

Test No: FR-082-09

SOLUTION

1. Steel Profile.
2. **Tecwool® F** (thickness according to the profile's section factor and fire resistance time required).

APPLICATION

Tecwool® F is spread with a pneumatic machine pursuant to the following technical specifications:

The surface to be protected requires no prior primer, mesh or any other type of support for the mortar adherence.

The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc.

It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

Tecwool® F can provide different finishings: rugged, smooth, painted, etc., according to different aesthetic requirements. Once the spread is completed and in order to obtain a smooth finishing, a roller should be used and pressed slightly over the wet mortar until the desired finishing is obtained. It is possible to paint the mortar with elastic acrylic coatings to form a steam barrier. Before painting the mortar should be completely dry (28 days).

Once spread, mortar should be water sprayed superficially to ensure optimum settling of the cement.

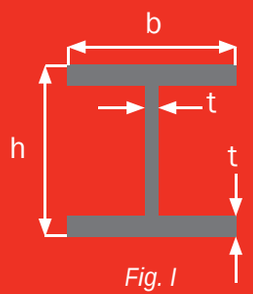


Fig. I

Fig. II - **4 SIDED**
P = 4b + 2h -2t

Fig. III - **3 SIDED**
P = 3b + 2h -2t

Fig. IV - **2 SIDED**
P = 2b + h - t

Fig. V - **1 SIDED**
P = b

SECTION FACTOR CALCULATION

Tecwool® F application on a metal structure is performed covering the entire surface of the profile that could be attacked by fire.

We define the profile section factor (profiled) or mass factor as: the relation between the section of the exposed external perimeter of the structural element itself per unit of length and its volumetric section per unit of length.

To simplify the calculation, the following expression is used:

$$Mass = \frac{P}{A} \ (m^{-1})$$

where:

P = Profile's protected straight section perimeter (m)

A = Profile's straight section area (m^2)

MASS CALCULATION EXAMPLES FOR HEB - 180

HEB - 180 profile measures

h = 180 mm / b = 180 mm / t = 8.5 mm

4 sided "profiled" protection example (See Fig. II)

1.- Perimeter exposed to fire calculation:

P = 4 x b + 2 x h - 2 x t = 4 x 180 + 2 x 180 - 2 x 8,5 = 1063 mm = 1,063 m

2.- Profile section:

A = 65,3 cm^2 = 0,00653 m^2

3.- Section factor:

$$\frac{1{,}063}{0{,}00653} = 162{,}8 \ (m^{-1})$$

2 sided "profiled" protection example (See Fig. IV)

1.- Perimeter exposed to fire calculation:

P = 2b + h - t = 2 x 180 + 180 - 8,5 = 531,5 mm = 0,5315 m

2.- Profile section:

A = 65.3 cm^2 = 0,00653 m^2

3.- Section factor:

$$\frac{0{,}5315}{0{,}00653} = 81{,}4 \ \ (m^{-1})$$

Once the profile's form factor is known, we should look at the mortar thickness specification chart and find the **Tecwool®** mortar to be applied for that thick mass so as to comply with the required fire resistance.

MORTAR THICKNESS SPECIFICATION CHART ACCORDING TO THE REQUIRED FIRE RESISTANCE AND THE PROFILE'S SECTION FACTOR

The information in this chart appears in the characteristics report under file 08/32302469.

Valid chart for 500 ºC design temperature on steel pursuant to UNE ENV 13381-4.

Masividad (m^{-1})	R 15 min	R 30 min	R 45 min	R 60 min	R 90 min	R 120 min	R 180 min	R 240 min	R 300 min
63	[15]	[15]	[15]	[15]	[17]	[23]	[35]	[47]	[59]
70	[15]	[15]	[15]	[15]	18	24	36	49	61
80	[15]	[15]	[15]	[15]	20	26	38	51	[64]
90	[15]	[15]	[15]	[15]	21	27	40	53	---
100	[15]	[15]	[15]	[15]	22	28	42	55	---
110	[15]	[15]	[15]	16	23	29	43	56	---
120	[15]	[15]	[15]	17	24	30	44	57	---
130	[15]	[15]	[15]	17	24	31	45	58	---
140	[15]	[15]	[15]	18	25	32	45	59	---
150	[15]	[15]	[15]	18	25	32	46	60	---
160	[15]	[15]	[15]	19	26	33	47	61	---
170	[15]	[15]	[15]	19	26	33	47	62	---
180	[15]	[15]	16	19	26	34	48	62	---
190	[15]	[15]	16	20	27	34	48	[63]	---
200	[15]	[15]	16	20	27	34	49	[63]	---
210	[15]	[15]	17	20	27	35	49	[64]	---
220	[15]	[15]	17	20	28	35	49	[64]	---
230	[15]	[15]	17	21	28	35	50	[64]	---
240	[15]	[15]	17	21	28	35	50	[65]	---
250	[15]	[15]	17	21	28	36	50	[65]	---
260	[15]	[15]	17	21	28	36	51	[65]	---
270	[15]	[15]	18	21	29	36	51	---	---
280	[15]	[15]	18	21	29	36	51	---	---
290	[15]	[15]	18	22	29	36	51	---	---
300	[15]	[15]	18	22	29	37	51	---	---
310	[15]	[15]	18	22	29	37	52	---	---
320	[15]	[15]	[18]	[22]	[29]	[37]	[52]	---	---
330	[15]	[15]	[18]	[22]	[29]	[37]	[52]	---	---
340	[15]	[15]	[18]	[22]	[30]	[37]	[52]	---	---

2. REINFORCED CONCRETE PROTECTION

until R 240

Used in most of modern buildings, concrete is part of today's landscape because of its multiple applications. However, concrete strength could be seriously impaired when exposed to fire, reducing its resistance when temperature exceeds 300 °C and losing it almost completely above 550 °C. In the case of reinforced concrete, framework resistance decreases after 250 °C, damaging the adherence between steel and concrete.

Mercor tecresa® markets **Tecwool® F** mortar, tested pursuant to standard UNE ENV 13381-3, this test determines its capacity to provide protection against fire, to remain cohesive and fixed to concrete and to provide data on the temperature distribution in the entire protected concrete element when exposed to standard temperature/time curve.

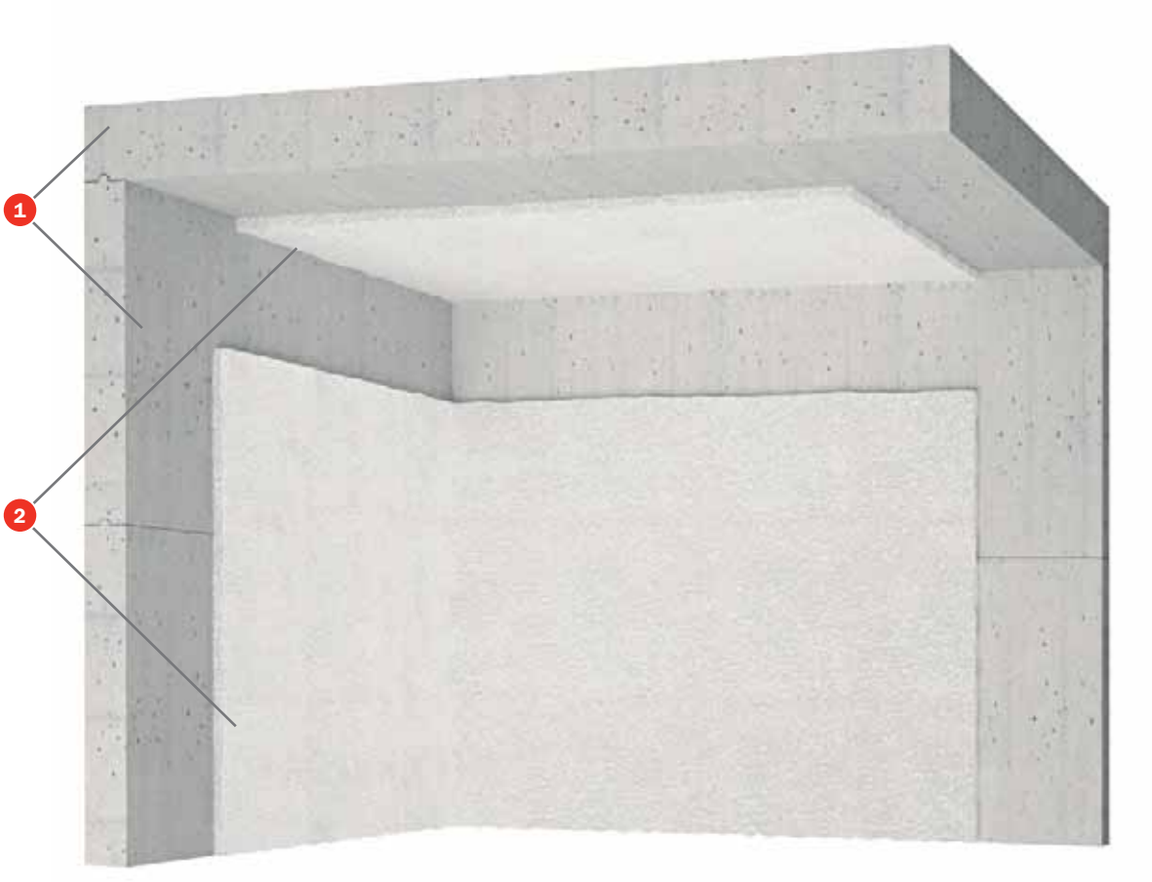
The temperature information obtained in the tests performed is used to provide:

- The relation among concrete temperature, time and thickness of the fire protection material.

- Concrete equivalent thickness.

Light, normal or heavy concrete could be used, strength classes being 20/25 (LC/C/HC) to 50/60 (LC/C/HC). The member can contain steel reinforcing bars.

2.1 SLABS, FLOORS, ROOFS AND WALLS PROTECTION



TESTS

Standard: UNE ENV 13381-3

Laboratory: CIDEMCO

Test No: 24033

Laboratory: FIRES

Test No: FR-066-09

SOLUTION

1. Concrete.
2. **Tecwool® F** (thickness according to concrete thickness and fire resistance time required)..

APPICATIONS

Tecwool® F is spread with a pneumatic machine pursuant to the following technical specifications:

The surface to be protected requires no prior primer, mesh or any other type of support for the mortar adherence.

The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftovers, etc.

It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

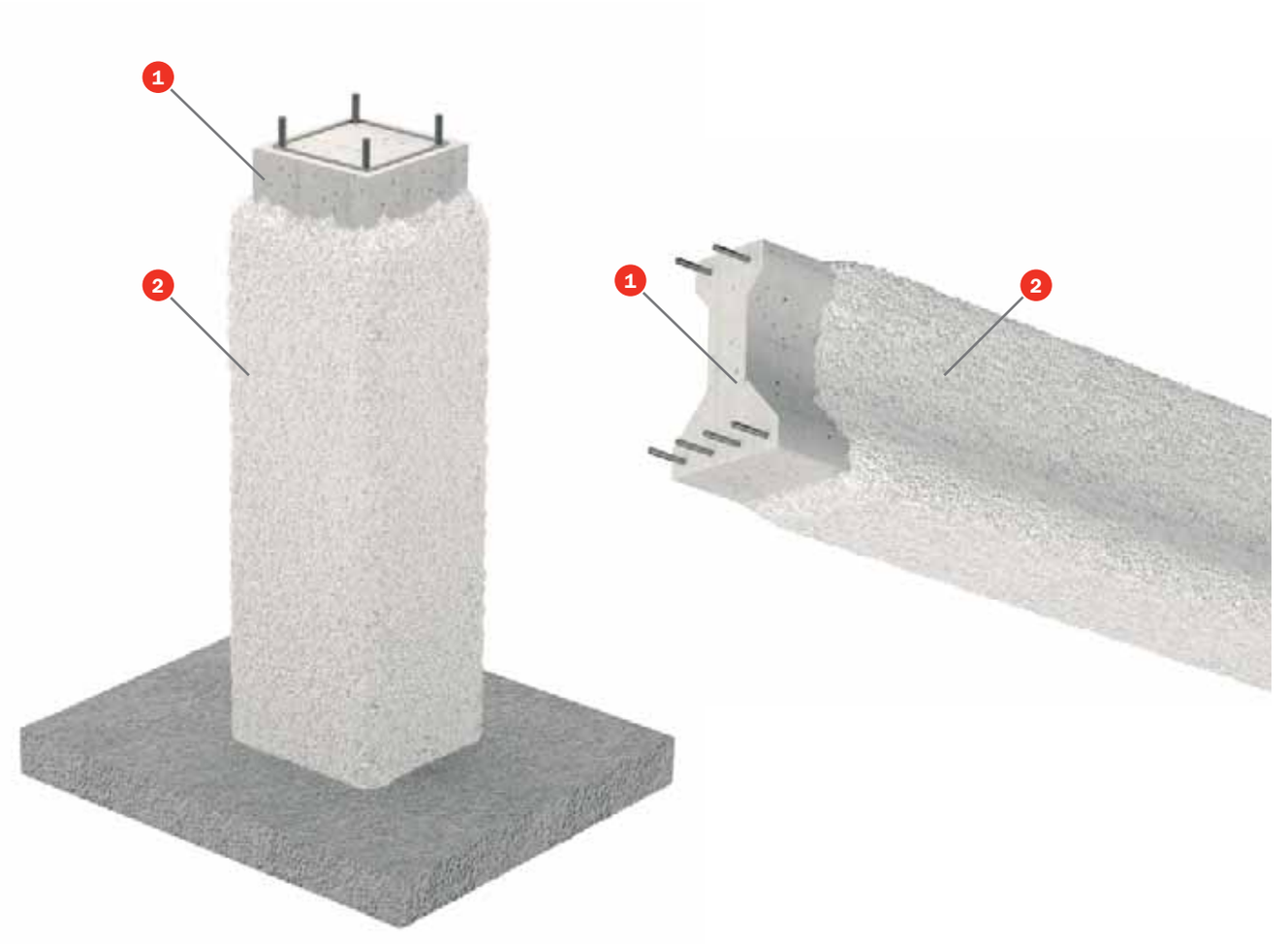
Tecwool® F can provide different finishings: rugged, smooth, painted, etc., according to different aesthetic requirements. Once the spread is completed and in order to obtain a smooth finishing, a roller should be used and pressed slightly over the wet mortar until the desired finishing is obtained. It is possible to paint the mortar with elastic acrylic coatings to form a steam barrier. Before painting the mortar should be completely dry (28 days).

Once spread, mortar should be water sprayed superficially to ensure optimum settling of the cement.

2.2 PROTECTION TO COLUMNS AND BEAMS

COLUMN

BEAM



TESTS

Standard: UNE ENV 13381-3

Laboratory: CIDEMCO

Test No: 24033

Laboratory: FIRES

Test No: FR-066-09

SOLUTION

1. Concrete column or beam.
2. **Tecwool® F** (thickness according to concrete thickness and fire resistance time required).

APPLICATION

Tecwool® F is spread with a pneumatic machine pursuant to the following technical specifications:

The surface to be protected requires no prior primer, mesh or any other type of support for the mortar adherence.

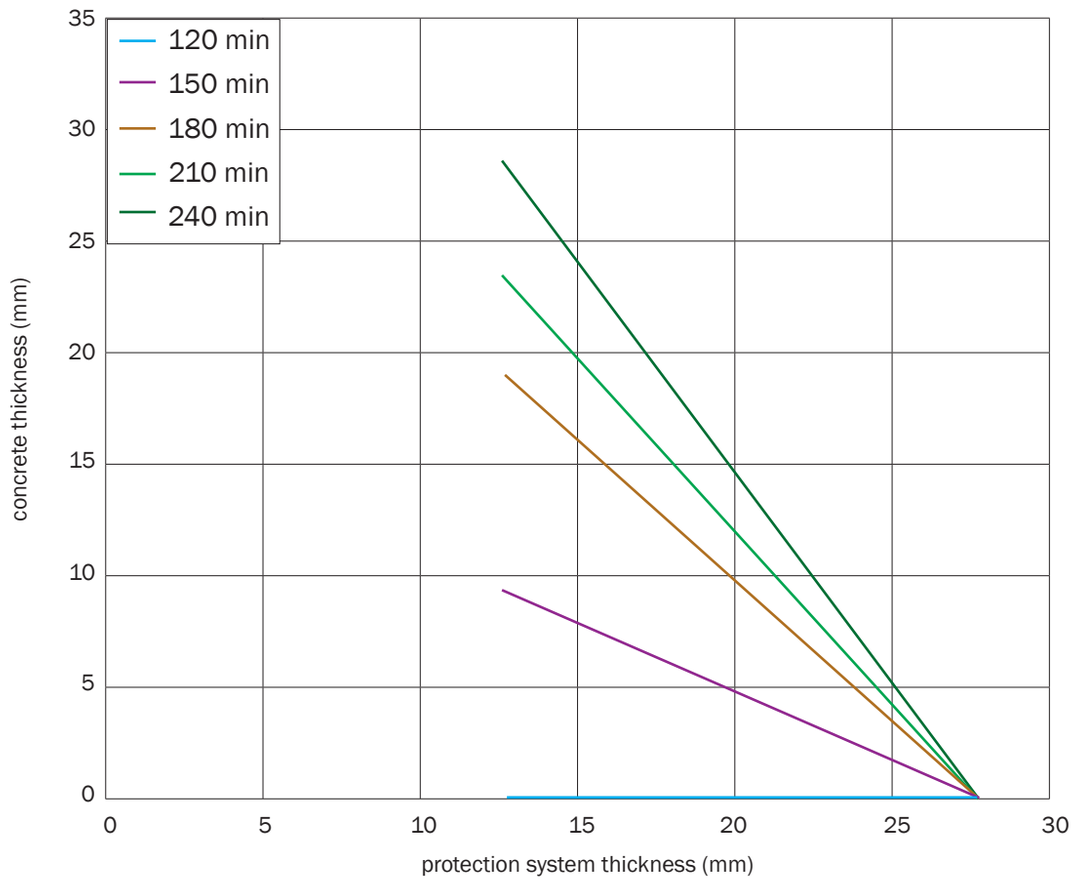
The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc.

It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

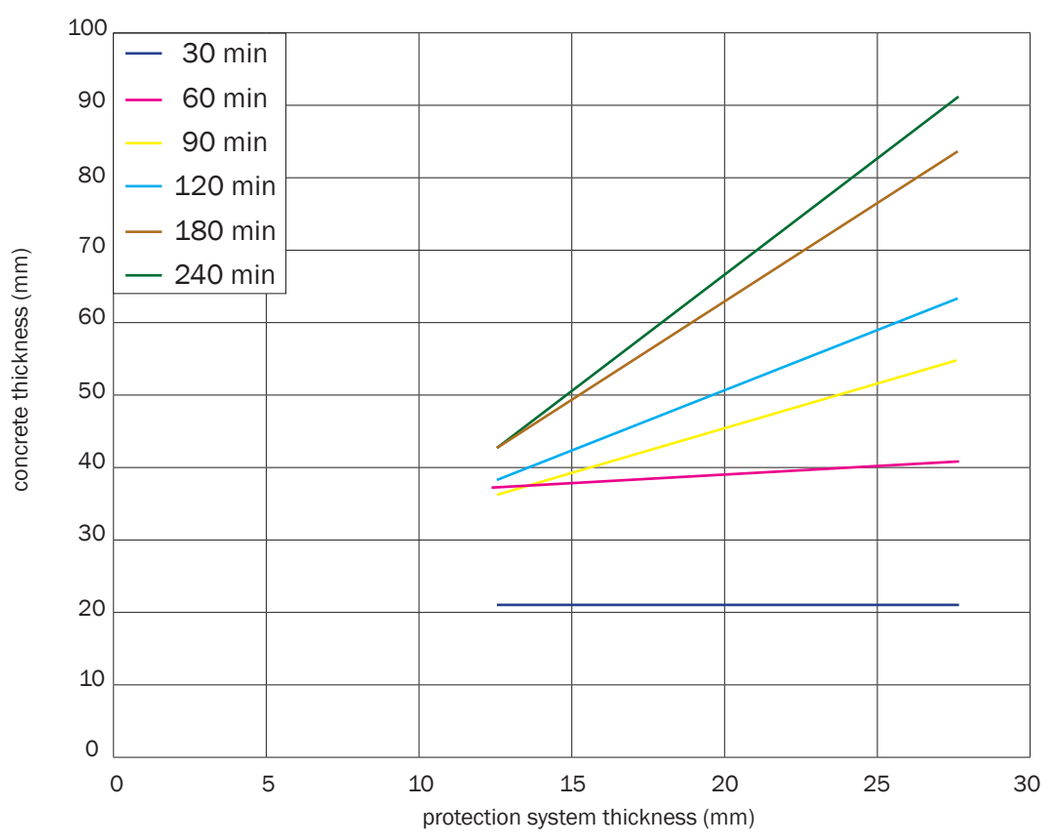
Tecwool® F can provide different finishings: rugged, smooth, painted, etc., according to different aesthetic requirements. Once the spread is completed and in order to obtain a smooth finishing, a roller should be used and pressed slightly over the wet mortar until the desired finishing is obtained. It is possible to paint the mortar with elastic acrylic coatings to form a steam barrier. Before painting the mortar should be completely dry (28 days).

Once spread, mortar should be water sprayed superficially to ensure optimum settling of the cement.

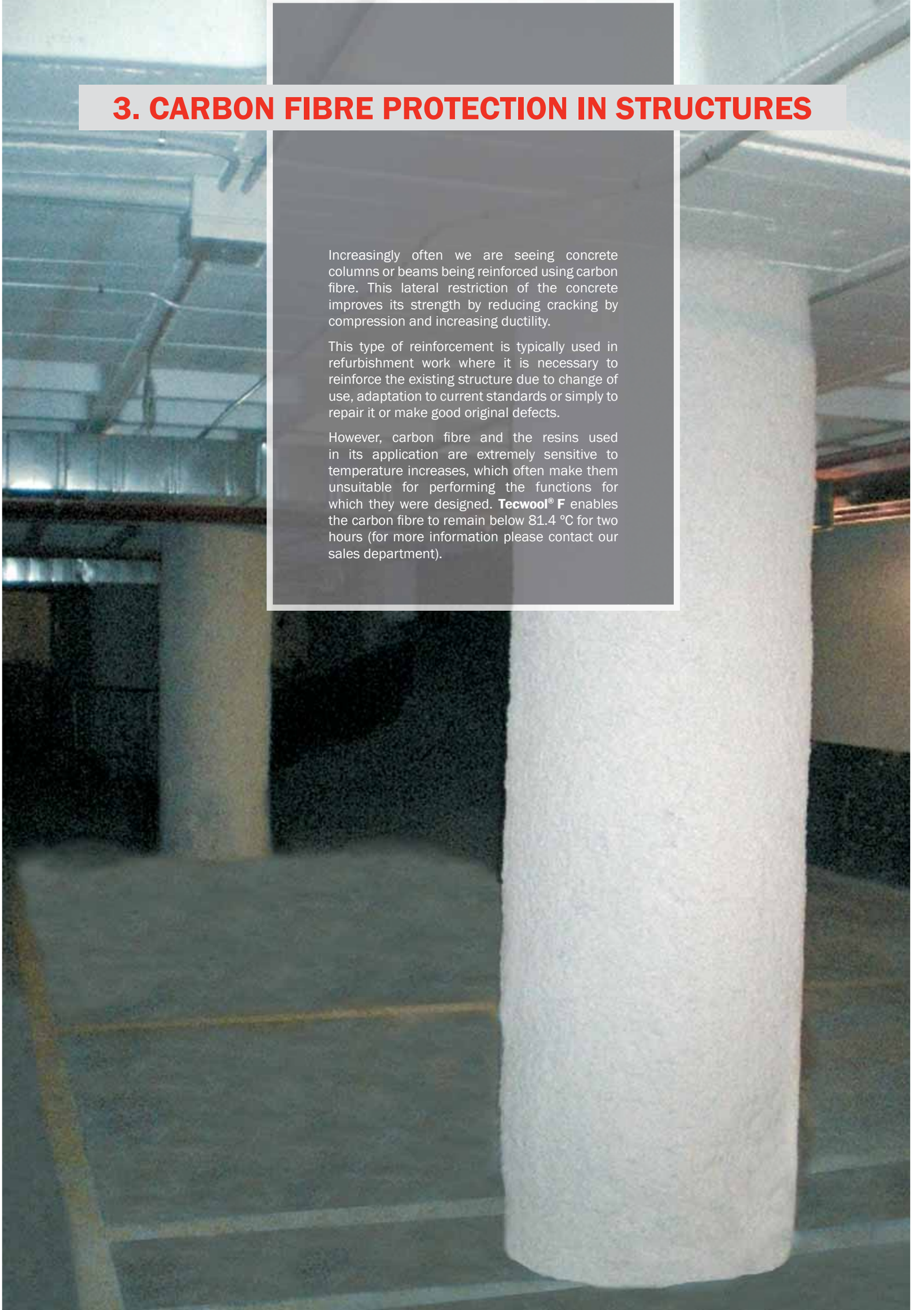
FIRE PROTECTION THICKNESS CURVE ACCORDING TO CONCRETE THICKNESS. CRITICAL TEMPERATURE AT 500 ºC. SLABS



CONCRETE EQUIVALENT THICKNESS CURVE ACCORDING TO APPLIED PROTECTION THICKNESS. CRITICAL TEMPERATURE AT 300 ºC



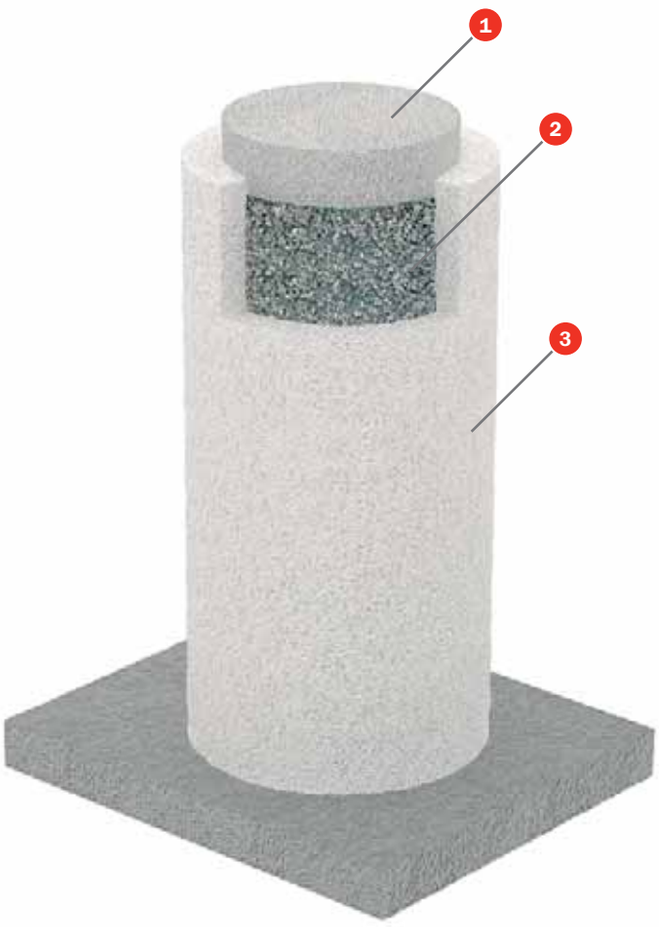
3. CARBON FIBRE PROTECTION IN STRUCTURES



Increasingly often we are seeing concrete columns or beams being reinforced using carbon fibre. This lateral restriction of the concrete improves its strength by reducing cracking by compression and increasing ductility.

This type of reinforcement is typically used in refurbishment work where it is necessary to reinforce the existing structure due to change of use, adaptation to current standards or simply to repair it or make good original defects.

However, carbon fibre and the resins used in its application are extremely sensitive to temperature increases, which often make them unsuitable for performing the functions for which they were designed. **Tecwool® F** enables the carbon fibre to remain below 81.4 °C for two hours (for more information please contact our sales department).



TESTS

Standard: UNE EN 1363-1

Laboratory: TECNALIA

Test No: 27796

SOLUTION

1. Concrete column.
2. Carbon fibre.
3. **Tecwool® F** (thickness of 50 mm)

APPLICATION

The carbon fibre surface must be rough, with this being achieved by sprinkling silica sand onto the still tacky outer coating of resin. This prevents any problems regarding the bond between the mortar and the resin (please contact our sales department for more information).

The surface to be protected shall be totally free of dust, oil and/or grease, loose particles, traces of paint, etc.

It is advisable to give the facing of the structure a light wash down using the water of the application hose itself in order to remove any remaining dirt. This shall also ensure that a thermal balance is reached between the mortar and the applied surface.

Tecwool® F puede proporcionar diferentes acabados: rugoso, liso, pintado, etc., en función de la estética requerida. Para acabados lisos se debe pasar un rodillo una vez finalizada la **Tecwool® F** can provide different finishes: rough, smooth, painted, etc. in accordance with the look required. For smooth finishes, once the application has been completed a roller must be lightly applied to the damp mortar until the desired finish is achieved. It is possible to apply elastic acrylic coatings to the mortar to prevent water vapour from penetrating the structure. The mortar must be totally dry (28 days) prior to application.

Following projection, the mortar must be lightly sprayed with water in order to ensure that the cement hardens in optimum conditions.

4. CONCRETE / PROFILED STEEL SHEET MIXED ELEMENTS' PROTECTION

until REI 120

Fire Resistance of Structural Members

We often find this type of solution both in new and refurbishment works as this kind of structure is really easy to assemble. It consists of a profiled metallic sheet that serves as the formwork base where a concrete slab is later added.

However, in the event of a fire, the simplicity of the solution itself entails the risk of the metallic sheet being directly exposed to fire, rendering the slab structure vulnerable.

Mercor tecresa® markets **Tecwool®F**, tested pursuant to standard UNE ENV 13381-5. With the temperature information obtained from the steel sheet through the concrete's thickness and non-exposed surface, we calculate:

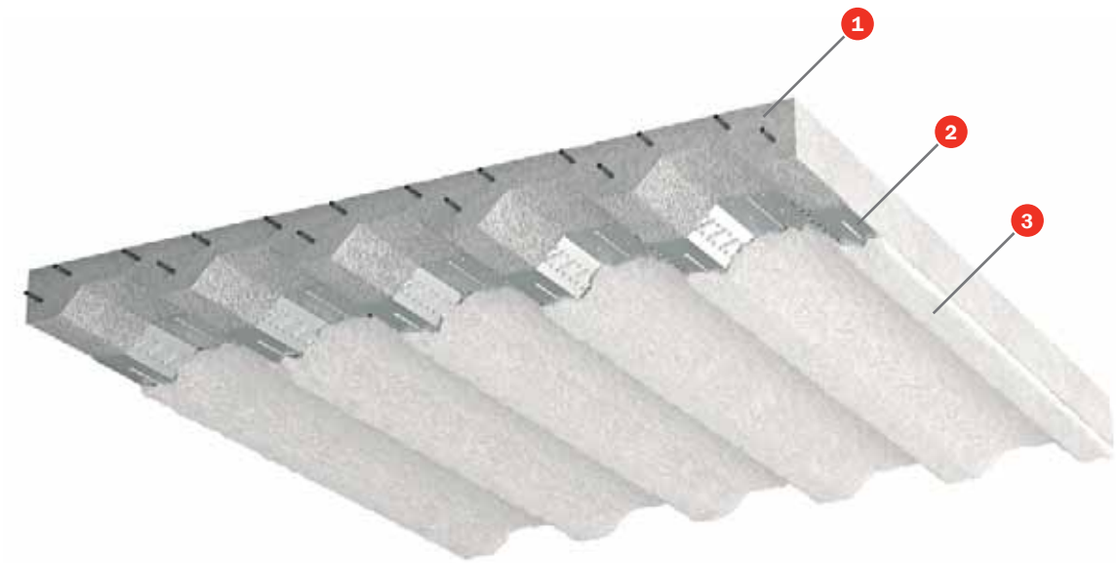
- The relation among steel temperature, time and thickness of the fire protection material.

- Concrete equivalent thickness, in relation to the thermal insulation criteria.

- Information on adherence capacity and exposure limit time.

For intermediate thickness values of the fire protection system, the time for regular temperature to increase up to 350 ºC is obtained through linear interpolation.

Light, normal or heavy concrete could be used, strength classes being 20/25 (LC/C/HC) to 50/60 (LC/C/HC). The member can contain steel reinforcing bars.



TESTS

Standard: UNE ENV 13381-5

Laboratory: APPLUS

Test No: 10/100324-148

SOLUTION

1. Concrete forging.
2. Profiled steel sheet.
3. **Tecwool® F** (thickness according to concrete thickness and fire resistance time required).

APPLICATION

Tecwool® F is spread with a pneumatic machine pursuant to the following technical specifications:

The surface to be protected requires no prior primer, mesh or any other type of support for the mortar adherence.

The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc.

It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

Tecwool® F can provide different finishings: rugged, smooth, painted, etc., according to different aesthetic requirements. Once the spread is completed and in order to obtain a smooth finishing, a roller should be used and pressed slightly over the wet mortar until the desired finishing is obtained. It is possible to paint the mortar with elastic acrylic coatings to form a steam barrier. Before painting the mortar should be completely dry (28 days).

Once spread, mortar should be water sprayed superficially to ensure optimum settling of the cement.

5. CERAMIC BLOCK AND WOODER BEAMS SLAB STRUCTURE

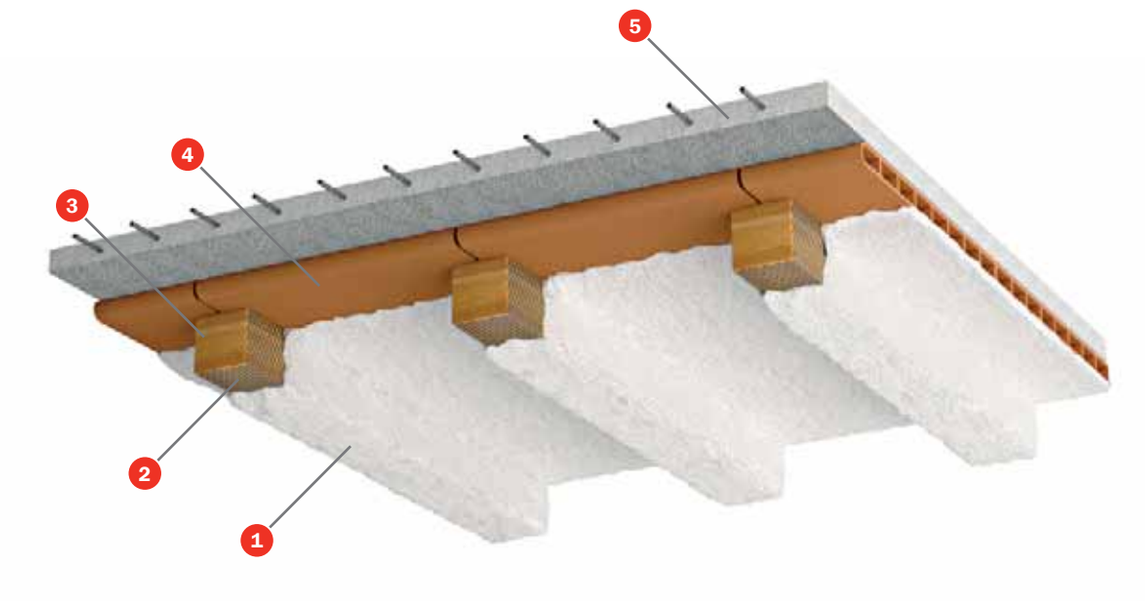
REI 180

Fire Resistance of Structural Members

In refurbishment building work, we usually find non-conventional slab structures. In this case, we have a slab structure consisting of a 50 mm thick concrete compression layer under which a hollow ceramic board supported by 140 x 140 mm wooden section beams is placed.

The test was performed pursuant to UNE EN 1365-2. Thermocouples were placed on the compression layer and throughout wooden beams, with the purpose of extrapolating the results to other more favourable configurations, provided that they remain within the limitations of the above mentioned standard.

For further information, Annex E to DB SI describes a calculation method to determine wooden structural elements' resistance to the action represented by the standard time/temperature curve. Fire resistance is mainly determined by beam sizes, fire exposure and the loads supported by them.



TESTS

Standard: UNE ENV 1365-2

Laboratory: APPLUS

Test No: 08/32311573

SOLUTION

1. **Tecwool® F** (23 mm thick)
2. Wire mesh.
3. Wooden beams.
4. Hollow ceramic board.
5. 50 mm thick compression layer.

APPLICATION

Due to wood particular characteristics, **Tecwool® F** application in this solution differs from other analysed faces. Wood hygroscopicity makes it absorb or release water from the surrounding environment.

To avoid adherence problems from wood shrinking, its surface is covered with a wire mesh fastened with clamps or the like after applying **Tecwool® F**. mortar.

The mesh acts as reinforcement between the product and the face, providing extra flexibility and adherence to the support structure, regardless of its expansion.

The application on the ceramic block is similar to that on concrete slabs and walls. It is important to verify that there are no holes in slab structure to avoid material waste and to provide the spread with a uniform and homogeneous finishing.

6. GALVANIZED DUCT PROTECTION

EI-60 / EI-120

Service Facilities Fire Resistance

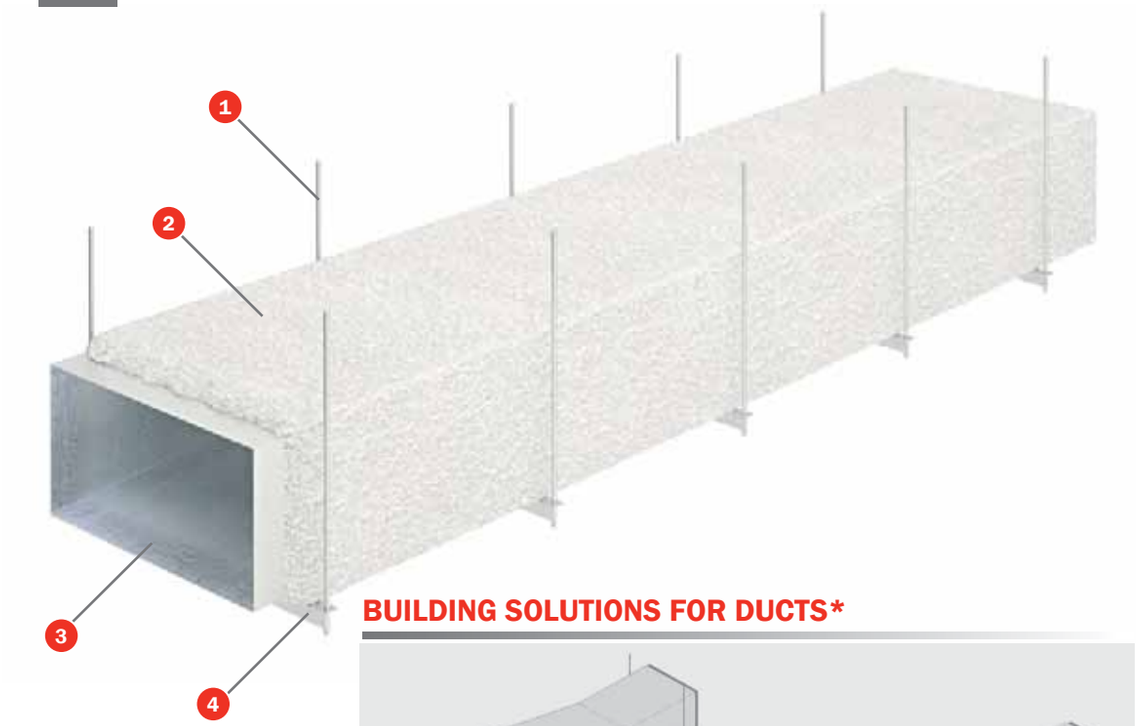
Most of new constructions are crossed by several installations such as: cables, pipelines, conduits, ventilation shafts, etc. These installations alter the subdivisions of the splitting elements, allowing fire and smoke to pass through different fire areas.

Both the Technical Building Code and the Safety Regulations against Fire in Industrial Facilities offer several solutions to prevent smoke and fire propagation throughout the installations.

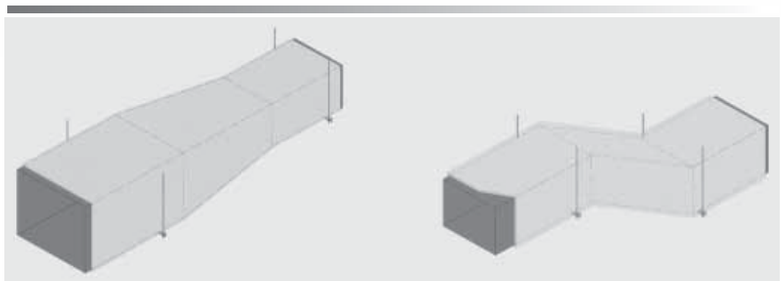
Tecwool® F mortar, the solution offered by **mercor tecresa®,** consists in providing elements with a resistance equal to or above the resistance of crossed elements. That is, the mortar directly applied to the sheet provides the solution with the integrity and insulation established by the standard, ensuring full sealing lengthways.

In the specific case of these solutions, a 0.6 mm plated horizontal duct and a vertical one were tested, exposed to external fire according to UNE EN 1366-1 standard, obtaining EI-60 and EI-120 classification.

6.1 PROTECCIÓN DE CONDUCTOS DE CHAPA HORIZONTAL. EI-60

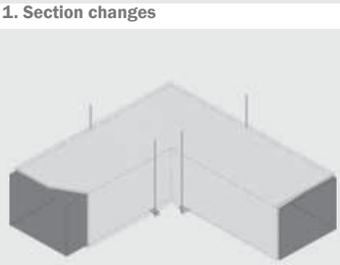


BUILDING SOLUTIONS FOR DUCTS*

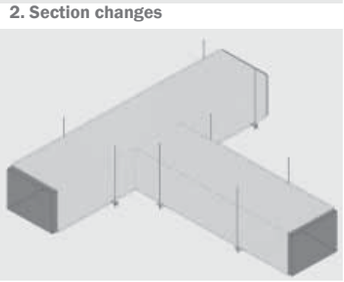


1. Section changes

2. Section changes



3. Elbow-shaped



4. Branches

TESTS

Standard: UNE EN 1366-1

Laboratory: APPLUS

Test No: 10/101513-1941

SOLUTION

1. M12 Rod
2. **Tecwool® F** (43 mm thick)
3. 0,6 mm thick metal plated horizontal duct.
4. Metal angle 50x50x5 mm.

APPLICATION

Tecwool® F is spread with a pneumatic machine pursuant to the following technical specifications:

The surface to be protected requires no prior primer, mesh or any other type of support for the mortar adherence.

The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc.

It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

Tecwool® F can provide different finishings: rugged, smooth, painted, etc., according to different aesthetic requirements. Once the spread is completed and in order to obtain a smooth finishing, a roller should be used and pressed slightly over the wet mortar until the desired finishing is obtained. It is possible to paint the mortar with elastic acrylic coatings to form a steam barrier. Before painting the mortar should be completely dry (28 days).

Once spread, mortar should be water sprayed superficially to ensure optimum settling of the cement.

7. FIRE BELT BARRIER SYSTEM/ROOF

EI 60 - EI 90 - EI 120

Safety Regulations against Fire in Industrial Facilities indicate that, when a dividing wall or a splitting construction element in fire prone areas connects into the roof, the resistance of the latter will be at least equal to half of that established for the construction element in a 1-metre firebreak. The firebreak could be:

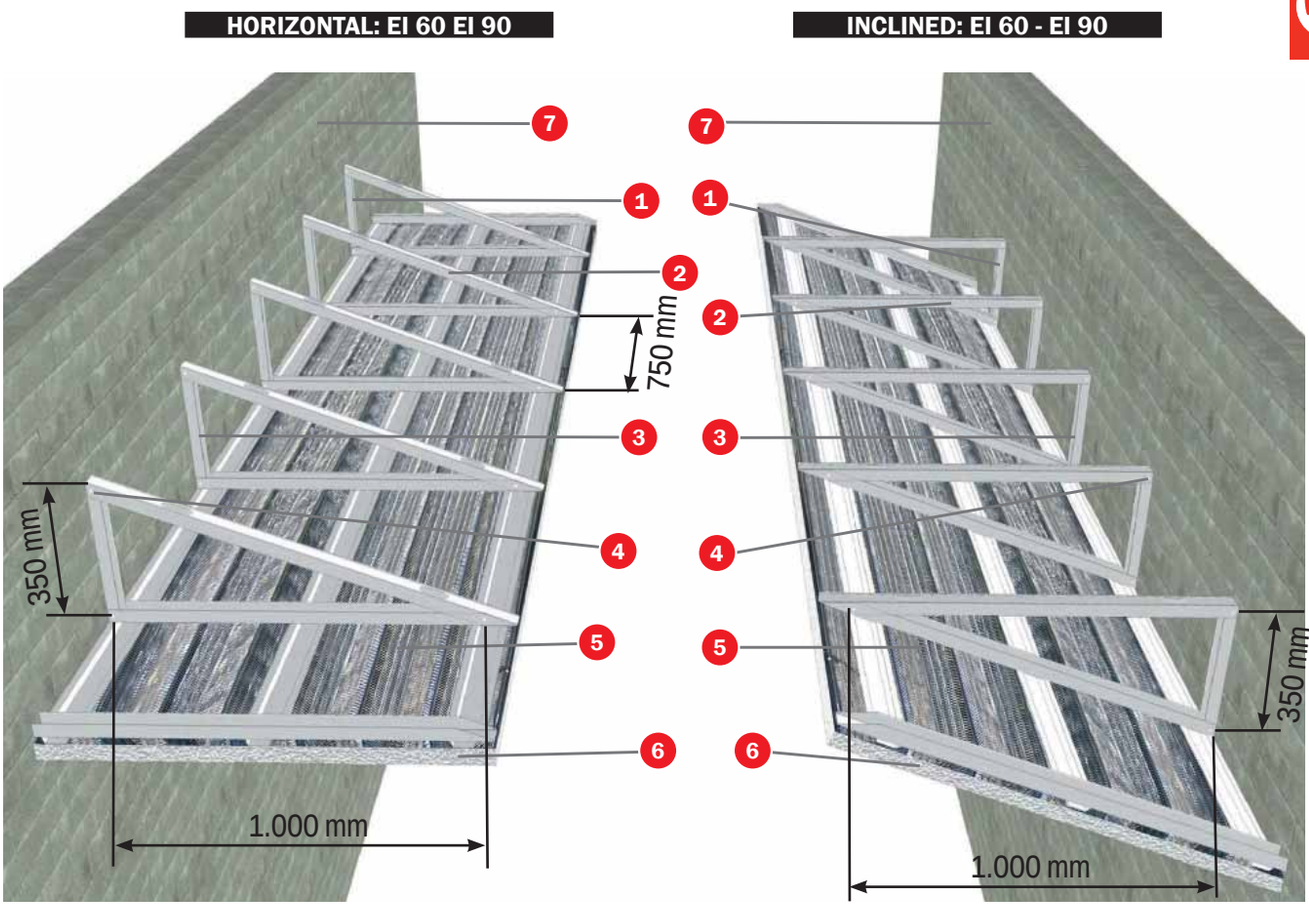
- Roof built-in as long as the firebreak presence is justified after non-resistant roof parts collapse.

- Fixed to the roof structure when it has the same fire stability as the firebreak resistance required.

- Made of a 1-metre wide barrier underneath the roof fixed to the diving wall, providing the fire resistance required. In no case should the barrier be installed at a distance greater than 40 cm from the roof lower part.

mercor tecresa® has designed and conducted this solution pursuant to the following European Standard (Document/Protocol): "**Fire Resistance Test of dividing wall/roof firebreak**," the classification obtained being **EI-60** y **EI-120**.

7.1 FIRE BELT BARRIER SYSTEM / ROOF FIREBREAK EI 60 - EI-90



TESTS

Standard: Fire resistance test protocol for fire belt barrier system/roof firebreak

Laboratory: TECNALIA

Test No:

060930-001-1 Horizontal

060930-001-2 Inclined

SOLUTION

1. 10x100 mm metal frame anchor
2. 46x36x0.6 mm stud
3. 48x36x0.5 mm wall support section
4. 4.2x27 mm sheet metal screw
5. Metal-ribbed mesh
6. **Tecwool® F** (thickness of **37 mm**)
7. Partition wall

APPLICATION

We build a framing square with 48x36x0,6 mm uprights, respecting the dimensions stablished on the details for the horizontal and inclined configurations.

The union between profiles is made by 4,2x27 mm metal-metal screws. The framing squares are placed each **750 mm** and fixed to the support work by dowel and screw of **10x100 mm**, at least two fixations per upright.

Three master omega profiles type **45x15x0,6** separated each **500 mm** and fixed by **4,2x27 mm** metal-metal screws

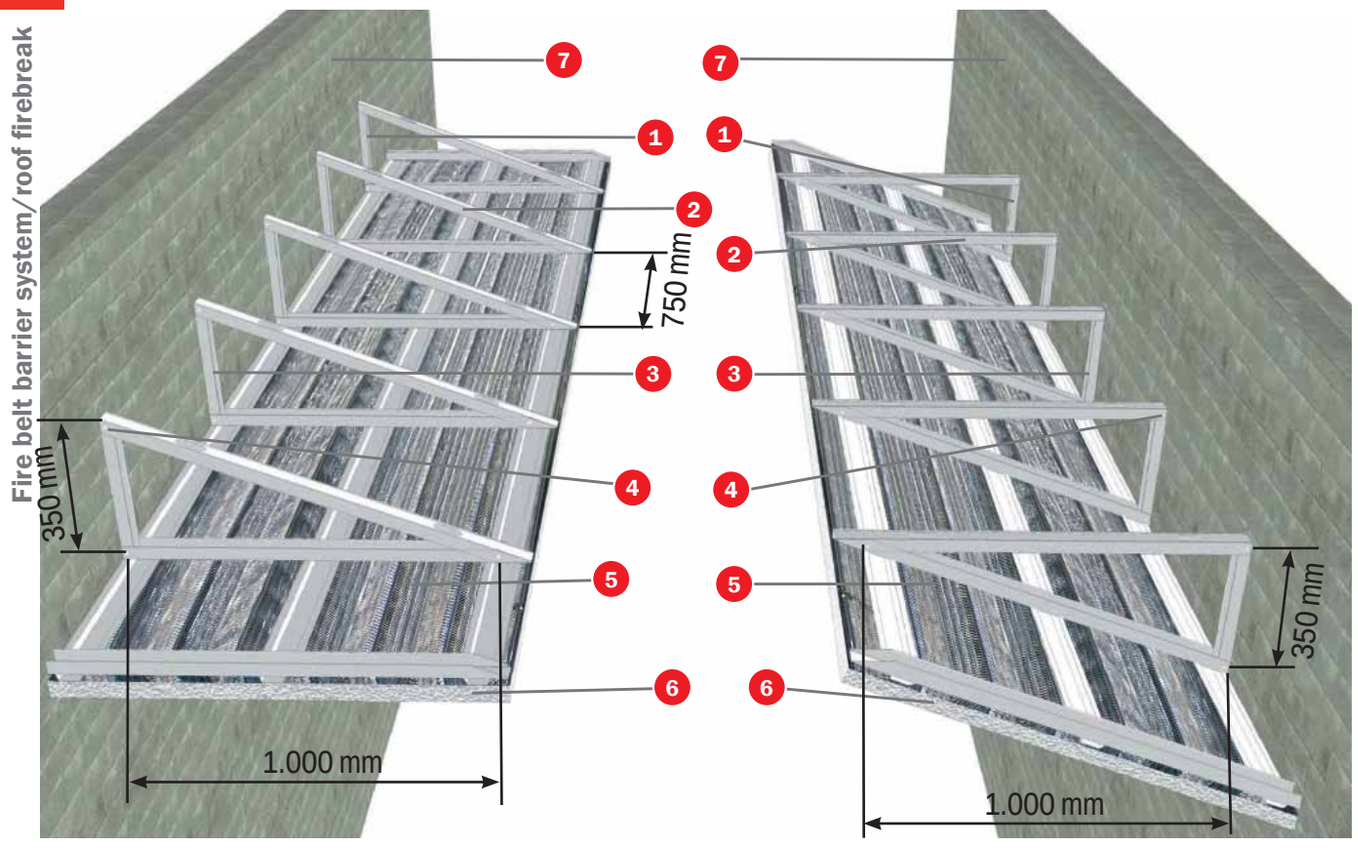
The nervometal Tecmesh will be fixed to the support structure on its omega profiles by self-tapping screws and the appropriate washer.

We will spray **37 mm** of **Tecwool® F** mortar over the nervometal.

The stripe has been tested horizontally and inclined making an angle of 30º to the horizontal. These configurations allow an installation on works in configurations from 0º to 50º of inclination to the horizontal, provided the assembly system and the maximum distances indicated and reflected previously in the different construction assembly details are respected.

7.2 FIRE BELT BARRIER SYSTEM / ROOF FIREBREAK EI 120

HORIZONTAL: EI 120 **INCLINED: EI 120**



TESTS

Standard: Fire resistance test protocol for fire belt barrier system/roof firebreak

Laboratory: TECNALIA.

Test No:

060930-001-1 Horizontal

060930-001-2 Inclined

SOLUTION

1. 10x100 mm metal frame anchor
2. 46x36x0.6 mm stud
3. 48x36x0.5 mm wall support section
4. 4.2x27 mm sheet metal screw
5. Metal-ribbed mesh
6. **Tecwool® F (**thickness of **50 mm**).
7. Partition wall

APPLICATION

We build a framing square with 48x36x0,6 mm uprights, respecting the dimensions stablished on the details for the horizontal and inclined configurations.

The union between profiles is made by 4,2x27 mm metal-metal screws. The framing squares are placed each **750 mm** and fixed to the support work by dowel and screw of **10x100 mm**, at least two fixations per upright.

Three master omega profiles type **45x15x0,6** separated each **500 mm** and fixed by **4,2x27 mm** metal-metal screws

The nervometal Tecmesh will be fixed to the support structure on its omega profiles by self-tapping screws and the appropriate washer.

We will spray **50 mm** of **Tecwool® F** mortar over the nervometal.

The stripe has been tested horizontally and inclined making an angle of 30° to the horizontal. These configurations allow an installation on works in configurations from 0° to 50° of inclination to the horizontal, provided the assembly system and the maximum distances indicated and reflected previously in the different construction assembly details are respected.

8. PARTITION WALL / LARGE FORMAT CLADDING

EI 120 - EI 180

Non-bearing partitions performing separation functions between fire compartments, must have a fire resistance as indicated on the **UNE EN 1364-1** standard.

When conducting a fire resistance test of non-bearing elements, part 1: walls, an edge is left free, the standard allows to increase the width dimensions.

Regarding height extension, the standard is clear and concise. When the construction is tested with a minimum of 3 meters, it is possible to increase it up to 4 meters.

On numerous occasions we find partition walls higher than 4 meters. **mercor tecresa®** is pioneer on the development of large dimension partition walls and offers the most efficient and confortable solution for this type of works. Consult our commercial department.

On the other hand, every time a compartment is broken, for example the services crossing, it is necessary to seal the gaps produced by them. Consult the **Tecsel® Sealing System** catalogue to find the most appropriate solution.

TESTS

Standard: UNE EN 1364-1

Laboratory: CIDEMCO

Test No: 27916

SOLUTION

1. 0,6 mm corrugated sheet
2. 3,5x25 mm self drilling screw
3. 46x36x0,6 mm stud
4. 60x60x1,5 mm metal structure
5. **Tecwool® F** (49 mm thickness)
6. 48x30x0,5 mm metal runner

APPLICATION

Fix the 60x60x1,5 mm metal structure (consult our commercial department for dimensions and fixations).

Fix the 48x30x0,5 mm metal runners over the modulation of the metal structure and over them, the 46x36x0,6 mm metal runners every 600 mm by 3,5x25 mm self-drilling screws.

Afterwards, place the 0,6 mm corrugated sheet and affix it to the studs with 3,5x25 mm self drilling screws. Lastly, apply **Tecwool®F** mortar over the corrugated metal sheet.

The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc.

It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

Tecwool® F can provide different finishings: rugged, smooth, painted, etc., according to different aesthetic requirements. Once the spread is completed and in order to obtain a smooth finishing, a roller should be used and pressed slightly over the wet mortar until the desired finishing is obtained. It is possible to paint the mortar with elastic acrylic coatings to form a steam barrier. Before painting the mortar should be completely dry (28 days).

Once spread, mortar should be water sprayed superficially to ensure optimum settling of the cement.

ASSEMBLY OF METALLIC STRUCTURE FOR LARGE DIMENSION PARTITION WALLS (> 4 m HEIGHT)

When the dimension of the partition walls is higher than 4 meters, it is necessary to place an additional structure.

This structural solution is offered in 5 standard pieces easy to install, making the partition wall independent from the tensions produced by the expansions and temperature changes, and also the own work settlement.

The large formar metallic structure, depending on the height, will be as follows:

Up to 8 meters height: 45x45x1,5 mm.

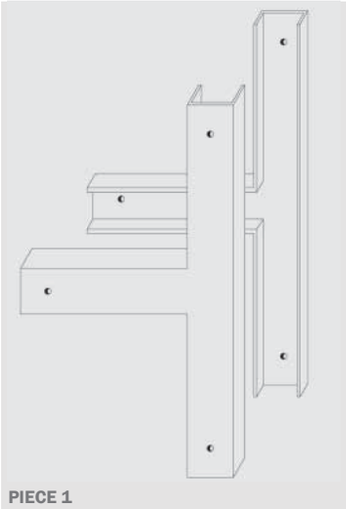
Partition walls higher than 8 meters: 60x60x1,5 mm.

1. System break down

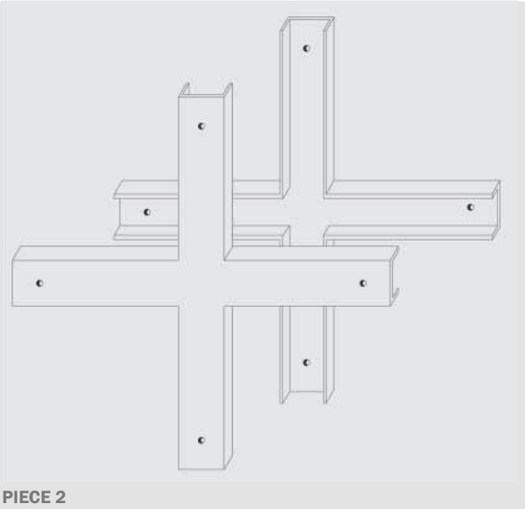
Structural solution consist of 7 standard pieces which are assembled as shown in the picture.

Pieces 3 and 7 present warped drill holes by which are fixed to the support work with dowels or metal anchors. Such warped drill holes allow movement iperpendicular to the direction of the partition wall in case of deformation. At the same time, piece 7 is articulated, so that in case of presenting inclinating angles it perfectly adapts to the support work to which is anchored.

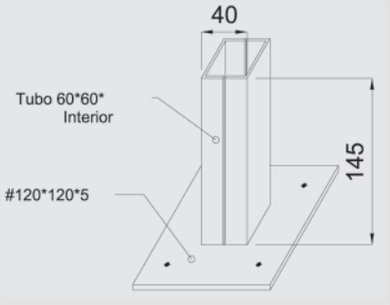
The rest of the pieces are assembled as shown in the drawing with their standard measures.



PIECE 1



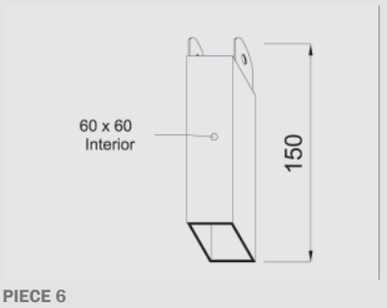
PIECE 2



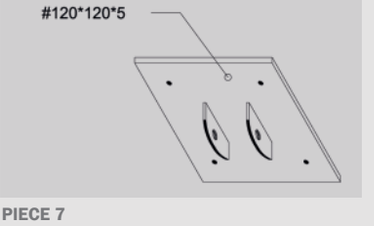
PIECE 3

PIECE 4

PIECE 5



PIECE 6



PIECE 7

2. System assembly and details

The structure forms a grid with dimensions shown in the drawing, in which independent areas of 8,28 m² will be formed.

Piece 4 represents the crossbeam and piece 5 the main stud.

Piece 2 is a connection at four points used to join pieces 4 and 5.

Piece 1 is a connection at three points used to join pieces 4 and 5 when it comes to the edge of finalisation or the beginning of the partition wall.

Once the metallic structure is placed, the profiling of the dry partition (metal runners and studs) shall be fixed onto such structure. Metal runners and studs are fixed to the structure with 19 mm nails within a distance of 250-300 mm.

Once the metallic structure is placed, the large format wall partition, the fireproof solution chosen according to the required solution, either **Tecbor®** boards or **Tecwool®** mortar will be installed.

An additional profile will be placed every three installed grids, providing the partition wall with perpendicular stability (consult with the Technical department).

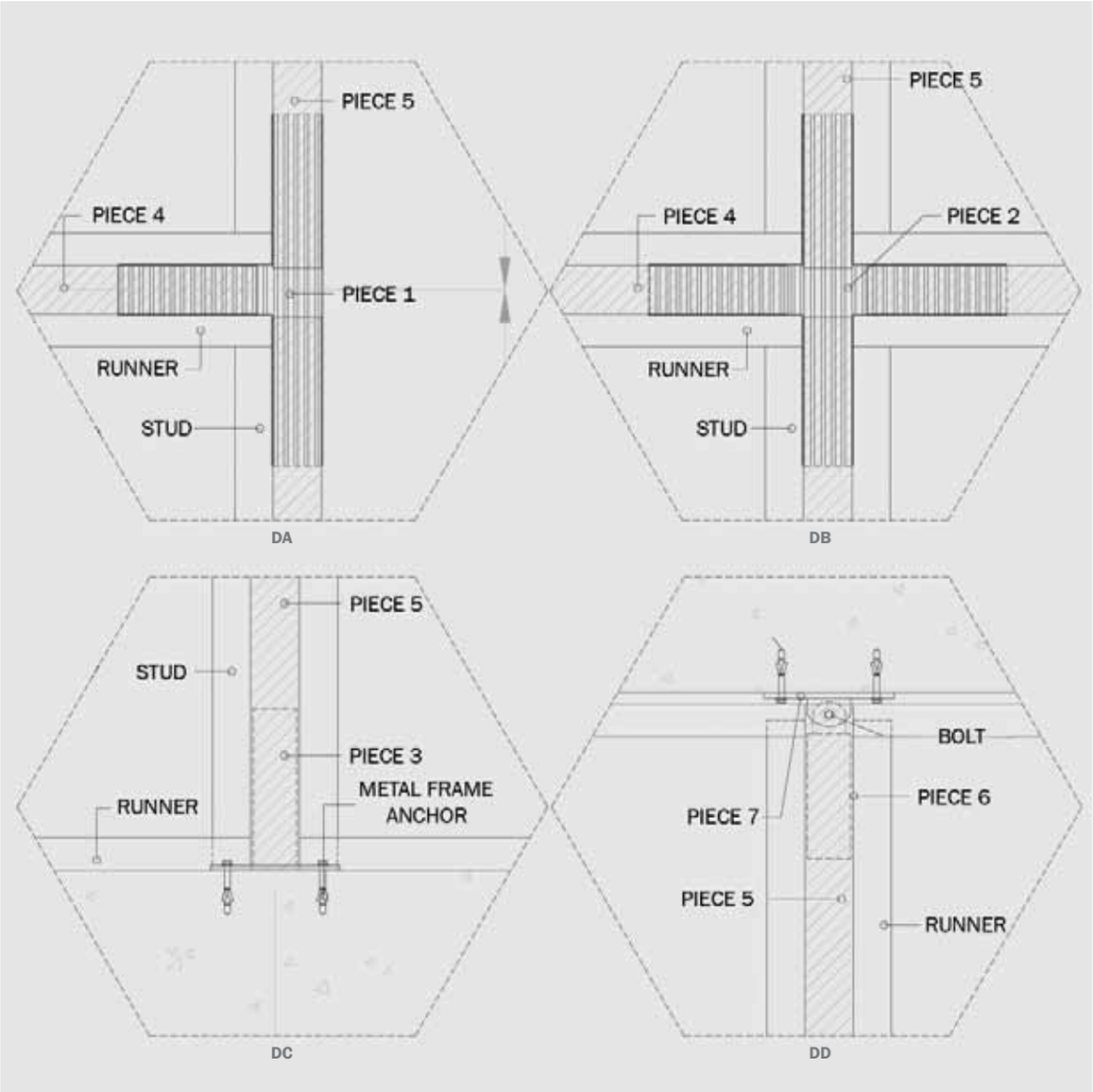
3. mortar Tecwool® application

As **Tecwool®** is a rockwool mortar, it is flexible enough to absorb the deformation produced by the expansions of the structure.

A free edge of 50-70 mm (it will depend on the dimensions of the partition wall) will be left at the top of the partition wall, which will allow the uniform movement of the partition wall from the support work. This edge will be sealed, either with exterior baseboard (100 mm wide) or **Tecsel®** sealing.

Consult our Technical Department for further information.

*Note: **Mercor tecresa®** garantees this solution,provided that all the components of the installation are from **mercor tecresa®** and the installation have been executed following the installation manual.*



9. TUNNEL PROTECTION

In case of a fire in a tunnel, material and human damages can only be avoided if the tunnel is adequately protected against fire.

In the last 10 years, several fires in tunnels have occurred worldwide. One of the conclusions is that we cannot simulate fires in tunnels with the same criteria applied to other constructions.

In this case, fires are destructive and reach high temperatures very rapidly. Besides, they can maintain these conditions during long periods of time. In other words, the standard time/ temperature curve included in standard **UNE EN 1363-1,** representing the pattern of a fire occurring in a certain fire section, is not suitable for evaluating fires in tunnels.

Consequently, we shall study the effects on materials through fire simulations produced by the combustion of hydrocarbons.

Other effect observed in fires developed in tunnels is referred to as “spalling” or concrete spalling process. As temperature rises, water in the concrete evaporates. However, steam does not run off properly causing the internal pressure to increase and the layers closer to the fire to spall off.

mercor tecresa® has tested **Tecwool® F** mortar in a real scale tunnel exposed to a gasoil-caused fire. A 40 mm mortar application was enough to surpass the test performed in San Pedro de Anes by **Tunnel Safety Testing S.A**.

TESTS

Standard: Real scale test.

Laboratory: Tunnel Safety Testing S.A. (TST)

SOLUTION

1 Concrete walls or slabs

2 **Tecwool® F**(40 mm thick)

APPLICATION

Tecwool® F is spread with a pneumatic machine pursuant to the following technical specifications:

The surface to be protected requires no prior primer, mesh or any other type of support for the mortar adherence.

The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc.

It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

Tecwool® F can provide different finishings: rugged, smooth, painted, etc., according to different aesthetic requirements. Once the spread is completed and in order to obtain a smooth finishing, a roller should be used and pressed slightly over the wet mortar until the desired finishing is obtained. It is possible to paint the mortar with elastic acrylic coatings to form a steam barrier. Before painting the mortar should be completely dry (28 days).

Once spread, mortar should be water sprayed superficially to ensure optimum settling of the cement.

TECWOOL® T

Fire protection

Thermal insulation

Acoustic absorption

Thermal insulation

Tecwool® T a rock wool and cement mortar manufactured by **mercor tecresa®**, is the perfect building solution to provide an optimum thermal insulation.

Its application by spreading allows a homogeneous coating, avoiding discontinuities and irregularities in the coating of building shells, thus solving the problem of heat bridges.

Tecwool® T adapts to a wide variety of supports, even when exposed to settlement vibrations or movements. No cracking or crazing as a result of its perfect adherence and flexibility.

Besides its insulation properties, **Tecwool® T** is A1 fire-reaction classified pursuant to UNE EN 13501, complying with specifications in the Technical Building Code for ventilation space internal surfaces and facades.

Lastly, it features exceptional characteristics regarding sound and acoustic absorption in reverberation room.

TECHNICAL CHARACTERISTICS AND SPECIFICATIONS

Composition	Cement, rock wool and additives
Fire reaction	A1
Bulk mortar density	175 Kg/m³ ± 10%
Thermal conductivity	0,0456 W/mk
Alkalinity (pH value)	12,5
Resistance to fungi	Immune
Adherence	0,014 N/mm² failure
Marketing	5 kg sacks in 450 kg pallets

1. VENTILATED FACADE

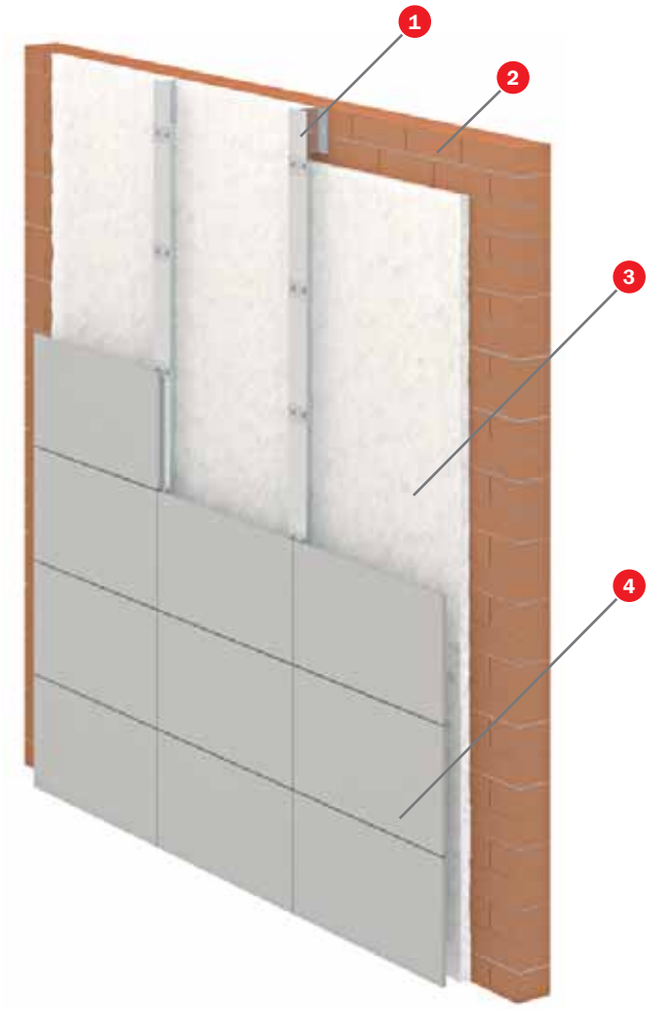
This kind of building solution is characterised by a ventilated space between the insulation and the external coating of the building.

The main feature of this facade is the so called “chimney effect”, which in summer causes the internal air to warm up and rise by convection. Its space is then occupied by fresh air avoiding heat build-up in the facade.

Conversely, this effect does not occur in winter since the air does not warm up to the point of generating this effect; however, in this case the ventilated facade acts as a heat accumulator.

Tecwool® T is the perfect solution to provide a continuous and homogeneous coating to the entire facade, avoiding a reduction in the enclosure’s thermal resistance. **Tecwool® T** provides an effective sealing since its application is joint-free. It does not favour steam condensation from the space air either.

Tecwool® T has an A1 fire reaction classification and complies with DB SI (B-s3d2) requirements for coating materials of ventilation space internal surfaces.



SOLUTION

1. Guiding profiles.
2. Building enclosure.
3. **Tecwool® T** (thickness according to necessary insulation).
4. External coating.

APPLICATION

Tecwool® T is spread with a pneumatic machine pursuant to the following technical specifications:

In case of applying over metallic sheet, concrete, bricks, etc., no prior primer, mesh or any other type of support for the mortar adherence are required.

The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc.

It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

Once spread, mortar should be water sprayed superficially to ensure optimum settling of the cement.

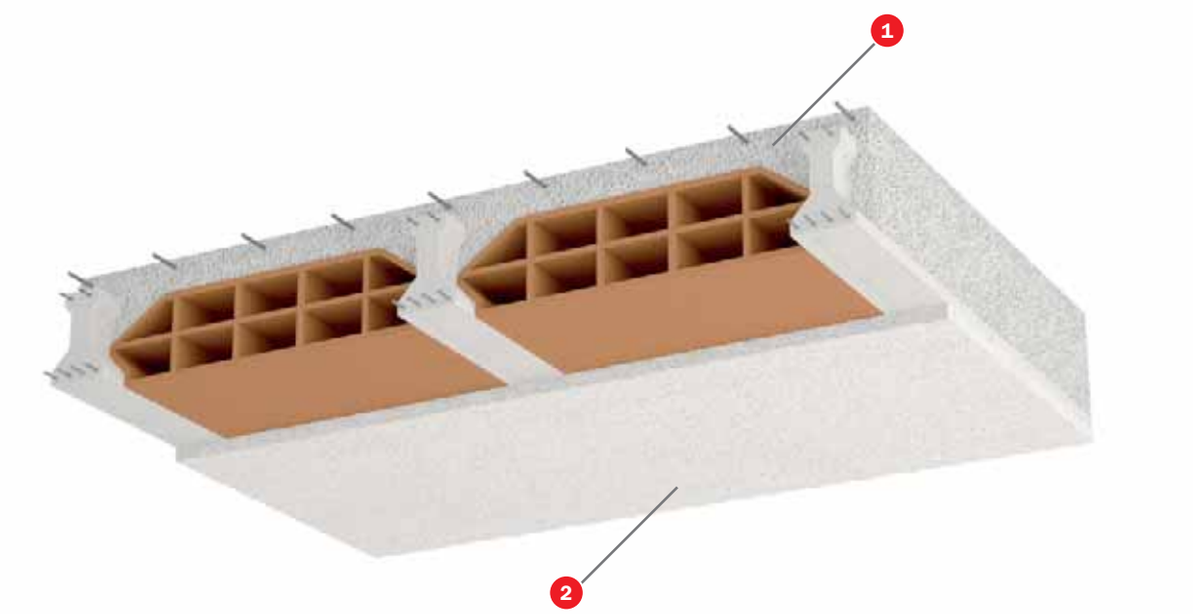
2. SLAB STRUCTURES AND WALLS OF PREMISES AND CAR PARKS

Tecwool® T is the best solution to provide a perfect thermal insulation between homes and non-heated premises (car parks, warehouses, etc).

Applied by spreading, a continuous and uniform finishing can be obtained both in the slab structure's lower side and over vertical splitting elements.

Tecwool® T ensures great acoustic insulation, minimising noise from running vehicles in car parks.

Tecwool® T has an A1 fire reaction classification complying with specifications in the Technical Building Code for this type of coating.



SOLUTION

1. Slab structure.
2. **Tecwool® T** (thickness according to necessary insulation).

APPLICATION

Tecwool® T is spread with a pneumatic machine pursuant to the following technical specifications:

Substrates as metal deck, concrete slab or brickwall does not need any previous treatment as primers, metal mesh or any others.

The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc.

It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

Tecwool® T can provide different finishings: rugged, smooth, painted, etc., according to different aesthetic requirements. Once the spread is completed and in order to obtain a smooth finishing, a roller should be used and pressed slightly over the wet mortar until the desired finishing is obtained. It is possible to paint the mortar with elastic acrylic coatings to form a steam barrier. Before painting the mortar should be completely dry (28 days).

Once spread, mortar should be water sprayed superficially to ensure optimum settling of the cement.

TECWOOL® 825

Fire protection for industrial applications and tunnels.

Fire protection for industrial applications and tunnels

Tecwool® 825 is a mortar made of rock wool, cement and small amounts of heat-resistant material manufactured by **mercor tecresa®** and specifically designed for fire protection for industrial applications and tunnels. Its cement content makes it highly robust. Once spread, it looks like a monolithic block highly resistant to erosion and semi-exposed or partially covered areas.

Tested under hydrocarbons curve, RWS curve and American UL standards, **Tecwool® 825** has been subjected to simulations to evaluate fires at high temperatures during a long period of time.

Tecwool® 825 adapts to a wide variety of supports, even when exposed to settlement vibrations or movements. No cracking or crazing as a result of its perfect adherence and flexibility.

Due to its alkalinity, the product resists fungi, does not corrode steel or release toxic or flammable vapour.

TECHNICAL CHARACTERISTICS AND SPECIFICATIONS

Composition	Cement, rock wool and additives
Fire reaction	A1
Bulk mortar density	385 Kg/m³ ± 10%
Bulk density of hardened mortar	613 Kg/m³ ± 10%
Bulk density of fresh mortar	1070 Kg/m³ ± 10%
Alkalinity (pH value)	12,5
Resistance to fungi	Immune
Marketing	25 kg sacks in 600 kg pallets

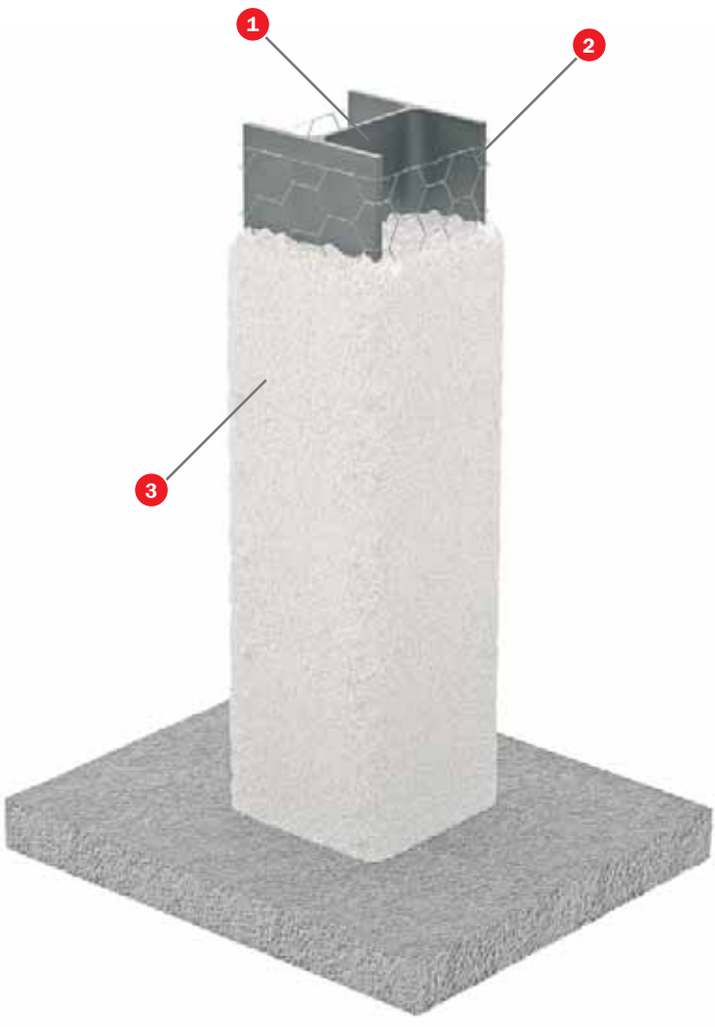
1 - Steelwork protection

Fire resistance of structural members

Metallic structures in chemical, petrochemical and power generating plants, among others, are likely to suffer fires generally caused by hydrocarbons.

Tecwool® 825 has been tested pursuant to standard UNE ENV 13381-4, and subjected to UL 1709 temperature curve, to determine its contribution to fire protection when applied to steel structural elements: beams, pillars or tension members.

Tecwool® 825 has been designed and tested to cover a great variety of steel profiles characterised by their section factor. Likewise, it is tested for several design temperatures specified in the standard.



TEST

Standard: PN ENV 13381-4

Laboratory: FIRES

Test No: FR-057-09

Standard: UNE ENV 13381-4

Laboratory: ITB

Test No: AT 15-8196/2009

SOLUTION

1. Steel profile.
2. Wire mesh.
3. **Tecwool® 825** (thickness according to the profile's section factor and fire resistance time required).

APPLICATION

Tecwool® 825 is spread with a pneumatic machine pursuant to the following technical specifications:

A wire mesh should be fastened to the support with electro-welded nails or the like, before applying mortar.

The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc.

It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

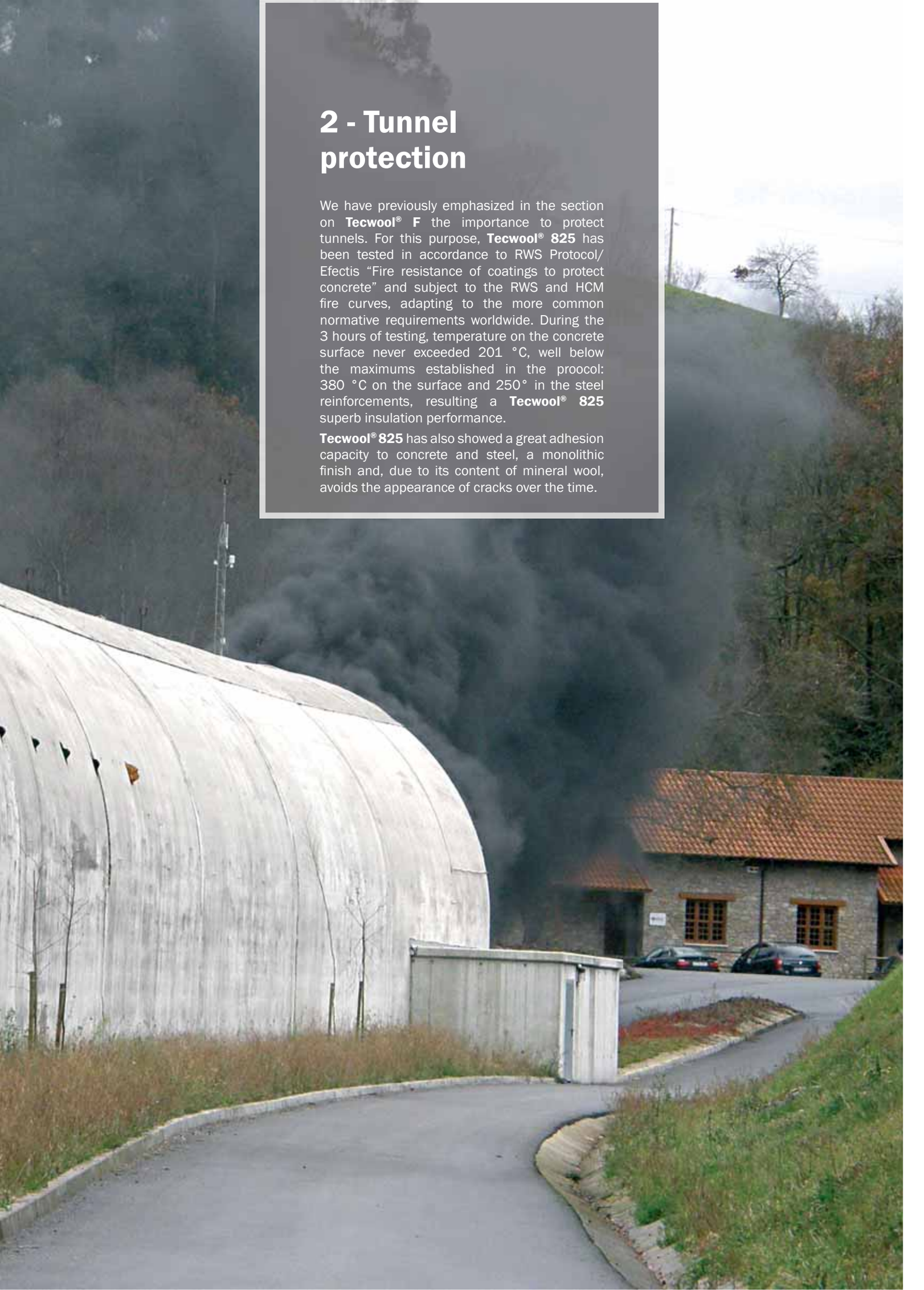
In structures prone to bumps, a wooden mortar formwork could be installed. During the spreading, mortar is pressed with a roller in order to render **Tecwool® 825** highly robust.

Tecwool® 825 isolation thickness requirements , open profiles.

U/A m^{-1}	Minimum protection thickness, mm depending on the type of fire resistance						
	R 15	R 30	R 60	R 90	R 120	R 180	R240
≤60	14	14	15	19	22	29	36
61 ÷ 80	14	14	17	20	24	32	40
81 ÷ 100	14	14	17	22	26	34	43
101 ÷ 120	14	14	18	22	27	36	45
121 ÷ 140	14	14	19	23	28	37	46
141 ÷ 160	14	14	19	24	28	38	47
161 ÷ 180	14	14	19	24	29	39	48
181 ÷ 200	14	15	20	25	29	39	49
201 ÷ 220	14	15	20	25	30	40	50
221 ÷ 240	14	15	20	25	30	40	51
241 ÷ 260	14	15	20	25	30	41	51
261 ÷ 280	14	15	20	26	31	41	52
281 ÷ 300	14	15	21	26	31	41	52
301 ÷ 320	14	15	21	26	31	42	52
321 ÷ 340	14	15	21	26	31	42	53
341 ÷ 360	14	15	21	26	32	42	53
361 ÷ 380	14	16	21	26	32	42	53
381 ÷ 400	14	16	21	26	32	43	53

Tecwool® 825 isolation thickness requirements, closed rectangular profiles.

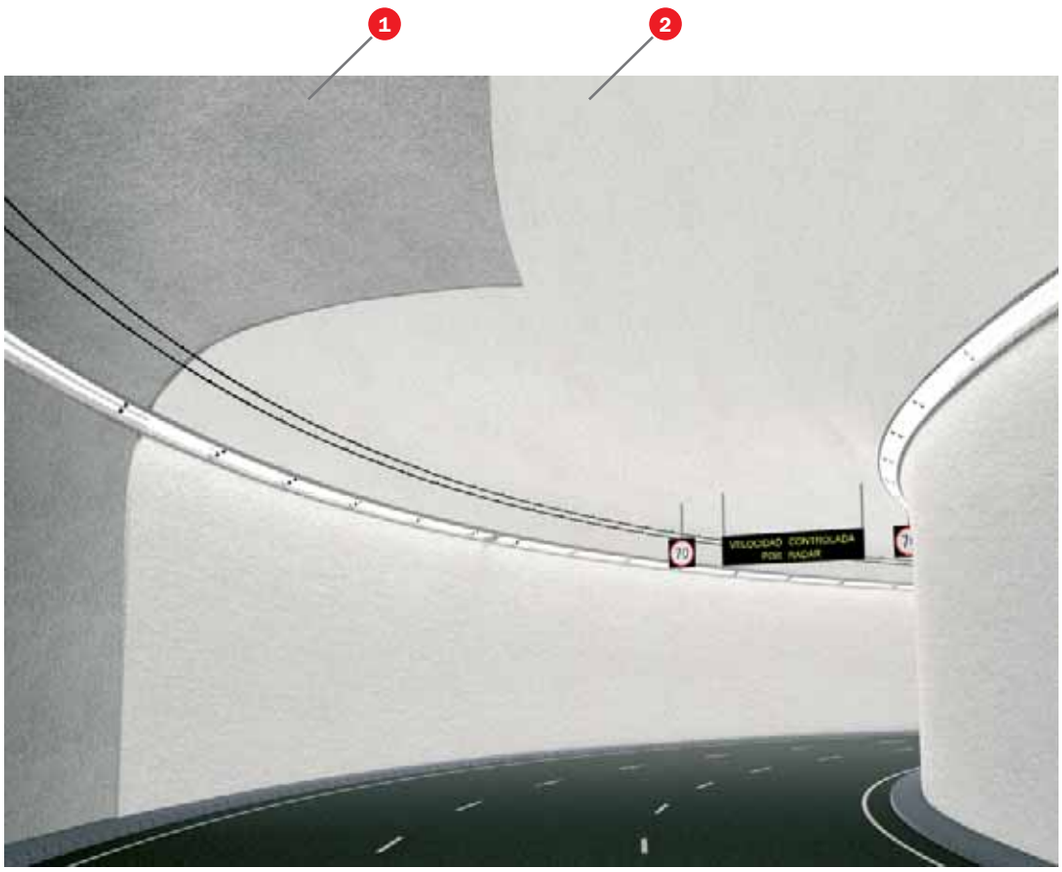
U/A m^{-1}	Minimum protection thickness, mm depending on the type of fire resistance						
	R 15	R 30	R 60	R 90	R 120	R 180	R240
≤60	14	14	19	25	30	40	50
61 80	14	15	20	26	32	43	55
81 100	14	15	21	27	33	45	57
101 120	14	15	22	28	34	47	60
121 140	14	15	22	28	35	48	61
141 160	14	16	22	29	36	49	62
161 180	14	16	23	29	36	50	-
181 200	14	16	23	30	37	51	-
201 220	14	16	23	30	37	51	-
221 240	14	16	23	30	37	52	-
241 260	14	16	23	30	38	52	-
261 280	14	16	23	31	38	52	-
281 300	14	16	23	31	38	53	-
301 320	14	16	23	31	38	53	-
321 340	14	16	24	31	38	53	-
341 360	14	16	24	31	39	53	-
361 380	14	16	24	31	39	54	-
381 400	14	16	24	31	39	54	-



2 - Tunnel protection

We have previously emphasized in the section on **Tecwool® F** the importance to protect tunnels. For this purpose, **Tecwool® 825** has been tested in accordance to RWS Protocol/ Efectis “Fire resistance of coatings to protect concrete” and subject to the RWS and HCM fire curves, adapting to the more common normative requirements worldwide. During the 3 hours of testing, temperature on the concrete surface never exceeded 201 °C, well below the maximums established in the proocol: 380 °C on the surface and 250° in the steel reinforcements, resulting a **Tecwool® 825** superb insulation performance.

Tecwool® 825 has also showed a great adhesion capacity to concrete and steel, a monolithic finish and, due to its content of mineral wool, avoids the appearance of cracks over the time.



TESTS

Standard: Protocolo RWS /Efectis Fire testing procedure for concrete tunnel.

Laboratory: Efectis Netherland

Test No: 2010-Efectis-R0531

SOLUTION

1. Concrete walls or slabs.
2. **Tecwool® 825** (thickness is depending on the fire resistance required and construction characteristics).

APLICACIÓN

Tecwool® 825 is spread with a pneumatic machine pursuant to the following technical specifications:

The surface to be protected requires no prior primer, mesh or any other type of support for the mortar adherence.

The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc.

It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

TECFILL®

Fire protection

Thermal insulation

Acoustic absorption

Thermal and acoustic insulation

Tecfill® is made of volcanic rockwool, particularly suitable for mechanical blowing. Its intended use is the application by blowing in roofs or injection in closed suspended frames through adapted machines. Specially suitable for thick walls. This product offers significant advantages:

· Speed and ease of application, no cuts.

· Adaptation to complex shaped works.

· Homogeneus filling, reduction of thermal bridges.

· High performance, both in winter and summer.

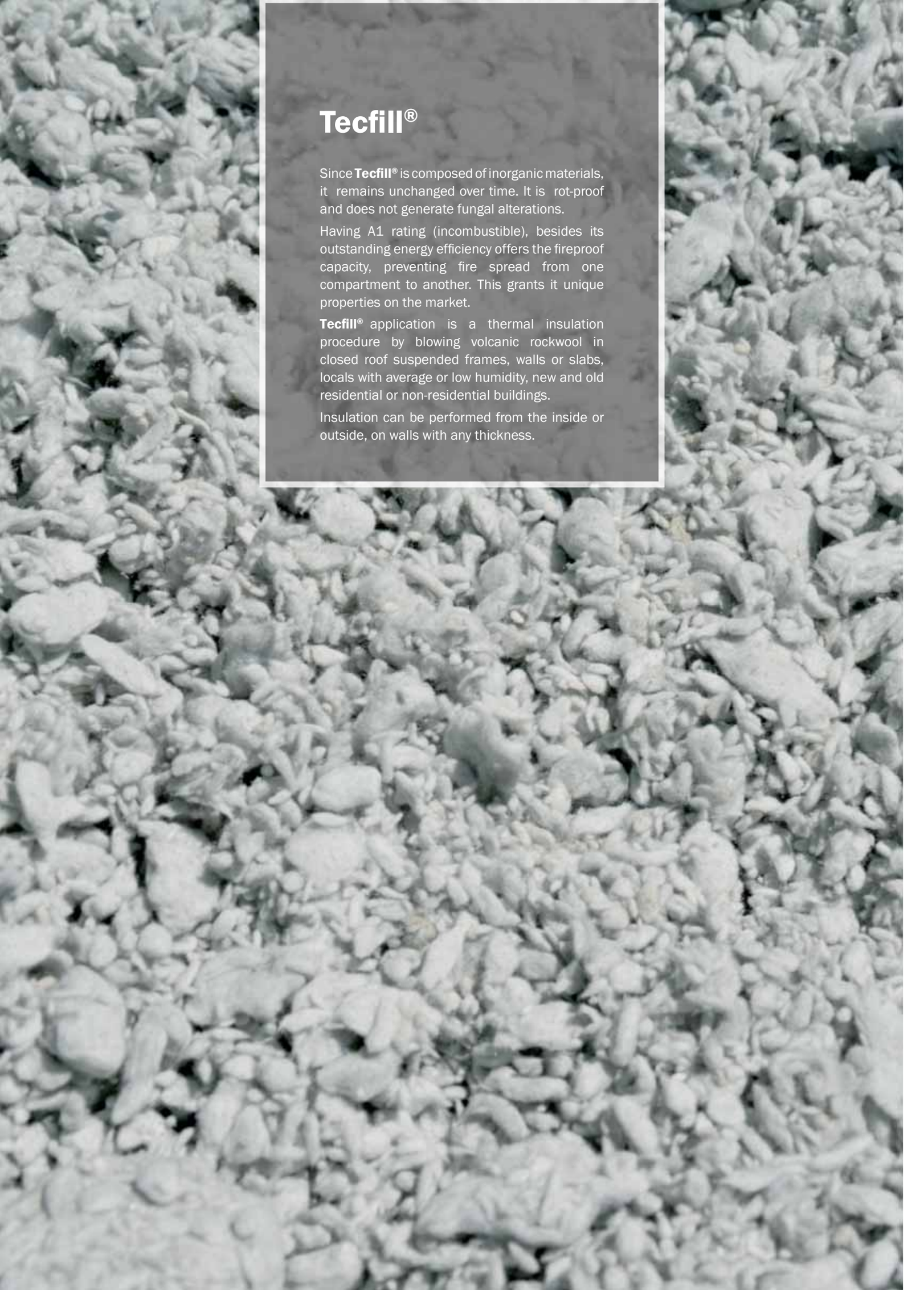
· Open to water vapour diffusion, hygrothermal convenience.

· Environmentally friendly.

· Application by **Tecfill®** certified professionals.

TECHNICAL CHARACTERISTICS AND SPECIFICATIONS

Obtained density	De 80 a 95 kg/m^3
Densidad nomial	80 kg/m^3 ± 10%
Thermal resistance	0,038 W/mk
Moisture content	< 5 %
Melting point	≥ 1.350 ºC
Reaction to fire	Euroclase A1
Biological behaviour	Not affected by microorganisms. Rot-proof. Chemically neutral.
Application density ρ (kg/m^3)	· Blowing Attic floor - approx. 70 - 80
	· Injection of suspending frames Roofs, floors, walls - approx. 80 - 95



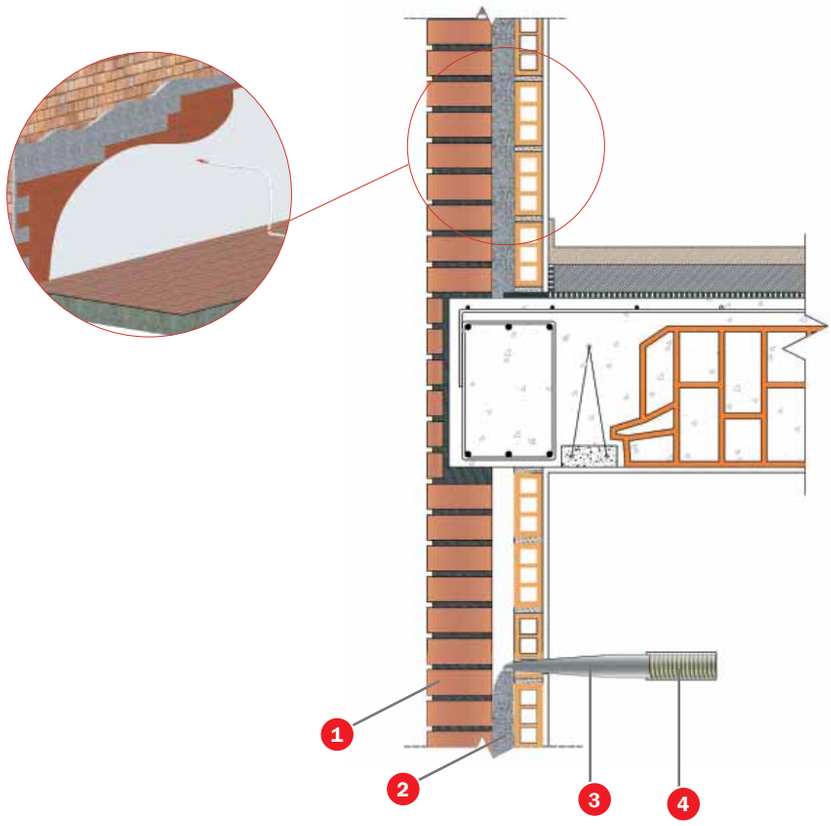
Tecfill®

Since **Tecfill®** is composed of inorganic materials, it remains unchanged over time. It is rot-proof and does not generate fungal alterations.

Having A1 rating (incombustible), besides its outstanding energy efficiency offers the fireproof capacity, preventing fire spread from one compartment to another. This grants it unique properties on the market.

Tecfill® application is a thermal insulation procedure by blowing volcanic rockwool in closed roof suspended frames, walls or slabs, locals with average or low humidity, new and old residential or non-residential buildings.

Insulation can be performed from the inside or outside, on walls with any thickness.



TESTS

Laboratory: CEIS acreditado por ENAC

Test No: CAT0044/15

SOLUTION

1. Ceramic brick
2. **Tecfill®**
3. Blowing noozle
4. Hose

APPLICATION

Tecfill® application is quick and easy, the desired insulation is achieved in very little time, cleanly and without major works. A **mercor tecresa®** skilled and accredited worker will perform the installation following the steps below:

1. Check the state of the cavity, veryfing the optimum application conditions.

2. Setting out of the penetration holes which will be done on the support work, guaranting the optimal distribution of the material in the cavity.

3. **Tecfill®** is blown dry, avoiding material waste, stains, drips, etc.

4. Once the cavity is filled with **Tecfill®** the worker will seal the holes of the support work with the most appropriate sealant (concrete, gypsum, mastic, etc.)

The installation worker will adjust the machine in accordance with the required insulation characteristics (thickness, density)

Tecfill® rockwool sacks are emptied in the machine's feed hopper to be blown. The rockwool is pneumatically blown through a hose and a nozzle towards the wall to be insulated. **Tecfill®** is blown through the holes drilled in the facing wall. The blowing hose diameter is 50 mm.

The application nozzle has a diameter of 50 mm, therefore, the hole must be 52 mm.

THERMAL RESISTANCE

Thickness (mm)	R (m²K/W)
30	0,79
40	1,05
50	1,31
60	1,57
70	1,84
80	2,1
90	2,36
100	2,63
110	2,89
120	3,15
130	3,42
140	3,68
150	3,94
160	4,21
170	4,47
180	4,73
190	5
200	5,26

TECWOOL® F&T

APPLICATION AND GENERAL USAGE

Besides the application characterisation on concrete and steel, detailed in each of the solutions of this catalogue, the following considerations should be taken into account for the rest of the faces.

Wood: A wire mesh should be fixed to the support before applying the mortar.

Asbestos cement: Surface must be clean and without cracks between sheets.

Galvanised or pre-lacquered metallic sheet: An adhesive primer will be necessary before applying the mortar.

Synthetic plastic: An adhesive primer will be necessary before applying the mortar.

Plaster surfaces: Plenty of water will be necessary on the support before applying the mortar. If the exposed side of the face to be protected is extremely smooth, its surface must be rubbed or chipped off to improve **Tecwool®**. adherence. If the thickness is greater than 3 cm, a wire mesh should be fastened to the support.

Bricks or porous support: Plenty of water must be applied on the support before mortar is spread.

The surface to be protected should be free from dust, oil, waste, poorly attached particles, release agents, paint leftover, etc.

As a general rule, and regardless of the supporting structure to which the mortar is applied, for thickness values above 55 mm a wire mesh should be used.

Spreading process should be performed with the proper machine.

The latter pushes dry **Tecwool®** mortar through the hose all the way to the nozzle where it is mixed with plenty of sprayed water for its later application. The spreading machine provides a flow between 3.2 and 18 kg/min. Mortar is applied with a spreading gun perpendicular to the support at a distance between 50 and 150 cm.

Tecwool® cannot be applied above 40°C or below 2°C. It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

Tecwool® can provide different finishings: rugged, smooth, painted, etc., according to different aesthetic requirements. Once the spread is completed and in order to obtain a smooth finishing, a roller should be used and pressed slightly over the wet mortar until the desired finishing is obtained. It is possible to paint the mortar with elastic acrylic coatings to form a steam barrier. Before painting the mortar should be completely dry (28 days).

Once spread, mortar should be water sprayed superficially to ensure optimum settling of the cement.

Generally, all contraindications regarding cement apply to **Tecwool®**. Application of this product on non-ferrous metals is forbidden.

Expires after 6 months.

TECWOOL® 825

APLICACIÓN Y USOS GENERALES

The surface to be protected shall be free of dust, oils, residues, poorly attached particles, paint leftovers, etc.

The surface to be protected should be free from dust, oil, waste, poorly attached particles, paint leftover, etc.

It is recommended to use water with the application hose to wash dirt away from the faces.

In structures prone to bumps, a wooden mortar formwork could be installed. During the spreading, mortar is pressed with a roller in order to render **Tecwool® 825** highly robust.

The spreading process is carried out with an appropriate machine, which pushes the **Tecwool® 825** dry mortar through the hose all the way to the nozzle, where it is mixed with plenty of water to be applied later on. The spreading machine provides a flow between 3.2 and 18 kg/min. Mortar is applied with a spreading gun perpendicular to the support at a distance between 50 and 150 cm.

Tecwool® 825 cannot be applied above 40°C or below 2°C. It is recommended to use water with the application hose to wash dirt away from the faces. This will also help achieve a thermal balance between the mortar and the applied surface.

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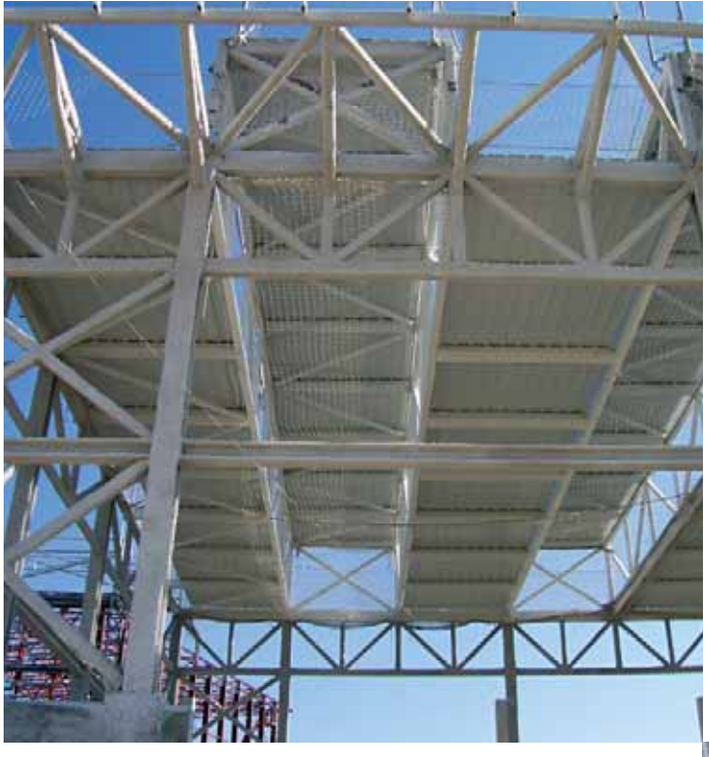
Expires after 6 months .

REFERENCE WORKS

- VALLADOLID RAILWAY COMPLEX
- REMODELING OF MADRID SOUTH BUS STATION
- ADOLFO SUÁREZ - BARAJAS AIRPORT, T4 AND T4S, MADRID
- BY-PASS M-30 NORTH AND SOUTH TUNNEL, MADRID
- URBAN ENTRANCE TUNNEL OF MALAGA AVE TRAIN
- AL SALAM STREET TUNNEL IN ABU DHABI
- REPSOL CAMPUS, MADRID
- BBVA LAS TABLAS HEADQUARTERS, MADRID
- ALBACETE TOWER, 3, MADRID
- PELLI TOWER, SEVILLA
- CASTELLÓ STREET OFFICES, 128, MADRID
- PALACE MARQUÉS DE SALAMANCA - BBVA FOUNDATION, MADRID
- FERROSER HEADQUARTERS, ALBARRACÍN STREET, 44, MADRID
- BUILDING SERRANO 66 STREET, MADRID
- PUERTO VENECIA SHOPPING MALL, ZARAGOZA
- EXTENSION AND ADAPTATION EQUINOCCIO SHOPPING MALL IN MAJADAHONDA, MADRID
- ZIELO SHOPPING MALL IN POZUELO DE ALARCÓN, MADRID
- ESPACIO MEDITERRÁNEO LEISURE AND SHOPPING MALL, CARTAGENA
- EXTENSION PARK CENTRAL SHOPPING MALL, TARRAGONA
- MAKRO Pº IMPERIAL, 42, MADRID
- PRIMARK GRAN VÍA, MADRID
- UNIVERSITY HOSPITAL REY JUAN CARLOS, MÓSTOLES, MADRID
- EXTENSION AND ADAPTATION, UNIVERSITY HOSPITAL CLINIC OF VALLADOLID
- EXTENSION MARQUÉS DE VALDECILLA HOSPITAL, SANTANDER
- VIGO HOSPITAL
- UNIVERSITY HOSPITAL OF FUENLABRADA
- REMODELING FACULTY OF MEDICINE, VALENCIA
- UNIVERSITY HOSPITAL OF BURGOS
- INFANTA SOFÍA HOSPITAL IN SAN SEBASTIÁN DE LOS REYES, MADRID
- COREYSA CLINIC, CIUDAD REAL
- NUESTRA SEÑORA DE LA PAZ CLINIC, MADRID
- 4 CAMINOS PRISON, BARCELONA
- REAL MADRID SPORT CITY, VALDEBEBAS, MADRID
- EDIFICIO GÉNESIS AVDA. DE BURGOS, 8 MADRID



REFERENCE WORKS

- GRAN VÍA CAPITAL, MADRID
- HEADQUARTERS NATIONAL INSTITUTE FOR STATISTCS, MADRID
- CONSTITUTIONAL COURT OFFICES, MADRID
- ADAPTATION MINISTERY OF ECONOMY AND COMPETITIVENESS, MADRID
- SUB-DEPARTMENT FOR NEW TECHNOLOGIES OF JUSTICE, MADRID
- MINISTERY OF AGRICULTURE AND ENVIRONMENT, MADRID
- NATIONAL MICROBIOLOGY CENTER IN MAJADAHONDA, MADRID
- Pº CASTELLANA OFFICES, 268, MADRID
- INTERNAL REFORM. OFFICE BUILDING PZA. LEALTAD 2, MADRID
- CARLOS III UNIVERSITY RESIDENCE IN GETAFE, MADRID
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- VASCO DE QUIROGA UNIVERSITY COLLEGE, MADRID
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- OIKOS HOTEL, SEVILLA
- BLUESPACE AVDA. DE LOS TORREROS, MADRID
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- ELECNOR SATELLITE INTEGRATION AND OPERATIONS CENTRE IN PUERTOLLANO, CIUDAD REAL
- CONSTRUCCIONES AERONÁUTICAS, S.A. EN GETAFE
- MERCEDES-BENZ FACTORY, BARCELONA
- LAS DEHESAS BIOMETHANIZATION PLANT, MADRID
- ACEITES ABRIL WAREHOUSE AND REFINERY IN OURENSE
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- HOTEL IN DIEGO DE LEÓN 43 STREET, MADRID
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