

## Fire protective spray materials for concrete, steel and wood Tested according to EN-standards



### Promat spray solutions

Promat offers spray based fire protection for steel, concrete and wood constructions. Each product has unique fire protective properties, ensuring you the best suitable solution for all types of applications.

The Promat spray solutions are a great choice when fire protecting constructions that are hard to access. Oddly shaped steel constructions or large concrete surfaces are examples of constructions where a spray based fire protection could be the best solution.

The PROMASPRAY product range, formerly known as Cafco spray products, is characterized by a wide product portfolio giving you the Best Insulating Performance to your building project.

The Promat spray products are all tested according to the latest EN test standards. This ensures you products of the highest quality.

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### Promat spray types and application

#### Spray types

Promat offers a variation of spray products, each with its own unique properties.

The spray products can be divided into two different product groups, wet mix sprays and dry mix sprays.

The difference between these two product types is the way the solution is mixed and applied to the subject.

A dry mix spray, is a spray consisting of fibrous material, and a concrete binder. This type of spray is poured into the mixing machine, and under pressure pushed to the nozzle of the hoze.

At the nozzle, water under high pressure is applied to the mixture, and propells the now finished mix to the substrate which needs protection.

A wet mix spray is a spray based on vermiculite and concrete or gypsum. This type of spray is mixed with water at the mixing station, before being propelled to the nozzle of the hoze under low pressure.

At the nozzle, air at high pressure propells the spray product to the substrate that needs protection.

Both spray types have their advantages, and it is project dependent which type would prove the most effective and with the lowest cost.

#### Application

The application must be performed by personnel certified by Promat, which ensures the qualification of the company. Promat offers free oneday-training to applicators.

Application of the products can be done when the temperature at the job site is as specified under each products, see page 4-6.



Tarpaulin enclosures and temporary heat or ventilation may be necessary to maintain the correct conditions. The substrate should not be subjected to shock or vibration during application or during the period required for the acquisition of the mechanical characteristics of the product.

### Promat spray products

Products	Material type	Protection of concrete structures	Protection of steel structures	Protection of composite floors	Protection of wooden floors	Protection of walls	Properties	Primers and finishes
							Fire protection	
PROMASPRAY® P300* (CAFECO® 300)	Vermiculite, plaster, wet method	X	-	-	X	X	X	Promat BONDSEAL®
PROMASPRAY® C450* (Cafco MANDOLITE® CP2)	Vermiculite, cement, wet method	X	X	X	-	-	X	Promat SBR - Bonding latex Promat® TOPCOAT 200
PROMASPRAY® F250** (BLAZESHIELD®)	Wool, cement, dry method	X	X	X	X	-	X	Promat BONDSEAL®

Names in () indicates Cafco names for the corresponding products.

\* Wet mix spray

\*\* Dry mix spray

Read description of the different product types on page 2.

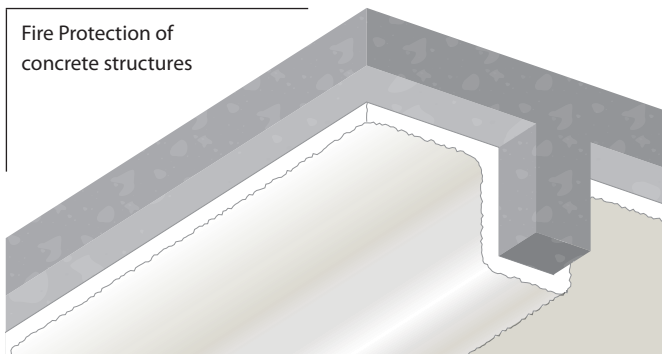
### Promat topcoats and adhesives

Products	Material type	Substrate	Properties	
			Adhesive	Finish
Promat® PSK 101	Synthetic latex (pneumatic projection or roller)	Steel	X	
Promat® SBR Bonding latex	Synthetic latex (pneumatic projection)	Concrete Steel	X	-
Promat BONDSEAL®	Polyvinyl acetate copolymer (projection or pneumatic brush)	Concrete Steel	X	-
Promat® TOPCOAT 200	Acrylic copolymer aqueous emulsion (pneumatic projection or roller)	PROMASPRAY® C450	-	X

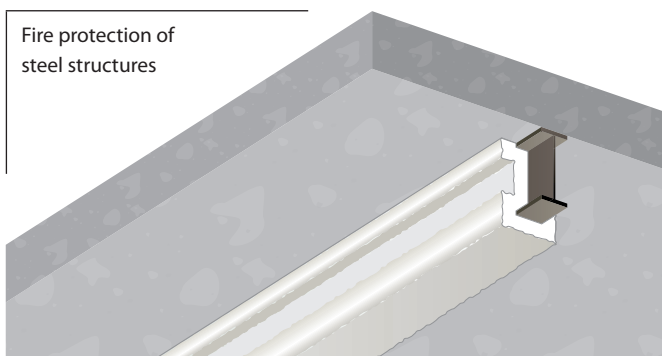
#### Safety

For the latest safety data sheet for each of these products, visit [www.promat.nu](http://www.promat.nu)

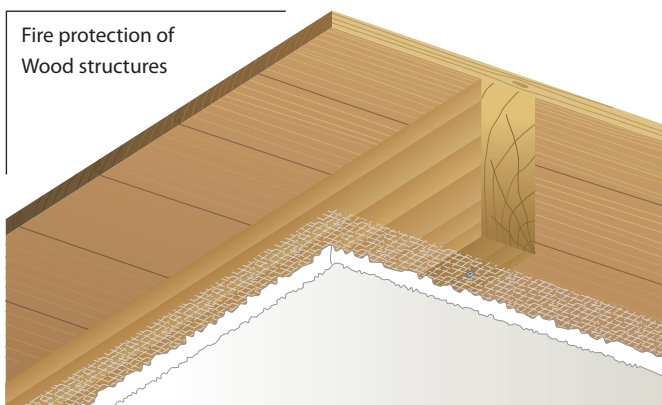
Fire Protection of  
concrete structures



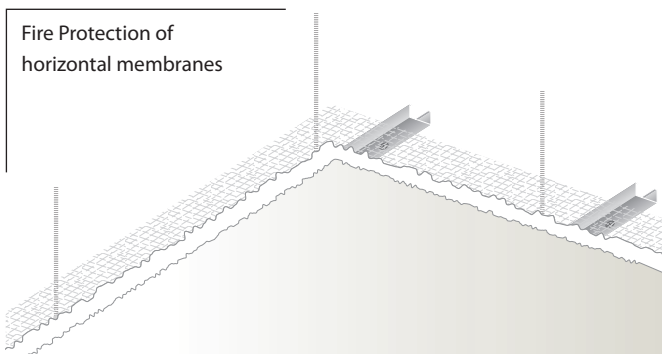
Fire protection of  
steel structures



Fire protection of  
Wood structures



Fire Protection of  
horizontal membranes



### Application Fields

- Fire Protection

### Description

PROMASPRAY®P300 is a vermiculite and gypsum based wet mix spray, for internal use only.

### Applications

- Floors and concrete structures
- Concrete slabs steel plate collaborating
- Wooden Floors (projection on expanded metal sheet)
- Horizontal membranes

### Properties and performance

- Resistant to rot and mould
- Resistant to pest and rodent attacks
- Non-combustible
- Easy to apply

### Safety

See safety data sheet

For the latest safety data sheet visit [www.promat.nu](http://www.promat.nu)

### Primer

Promat BONDSEAL®

### Finishing

Smoothing, untreated

### Packaging and Storage

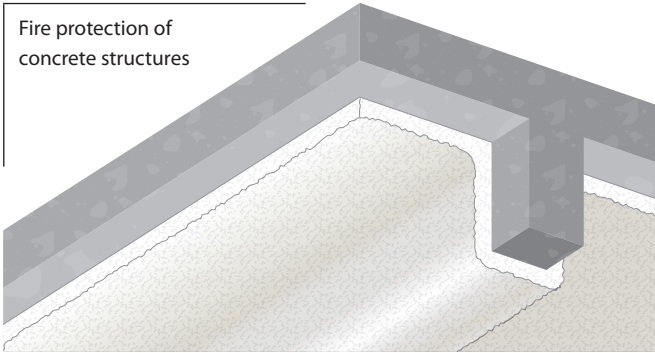
- Shelf Life: 6 months maximum from date of production in unopened packaging.
- Storage conditions: Protect from frost, moisture, excessive heat and permanent sunlight.
- Packaging: plastic bag of 20 kg.
- Pallet: 24 bags per pallet or 480 kg.
- Waste disposal: Do not discharge into drains, streams or soil. Use the trash bags provided for this purpose.

### Specification

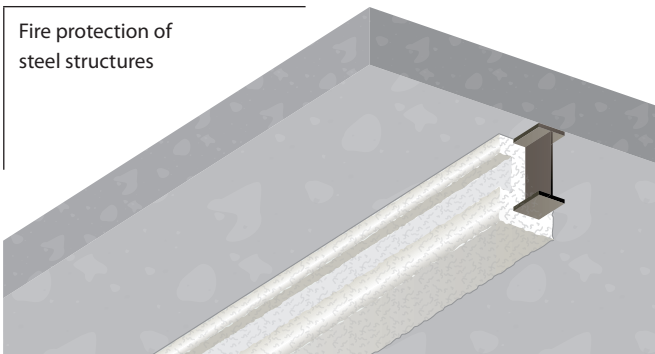
Color	Off white
Appearance	Raw projection
Density	310 kg/m <sup>3</sup> ±15 % without accelerator
Reaction to fire	A1
pH	8 - 8,5
Initial setting time	10 to 15 hours at 25 °C and 50 % HR without
Binding type	By hydraulic
Application temperature	Start: 2 °C and rising Stop: 4 °C and dropping Max temperature 45 °C
Number of layers	One or more if needed Minimum 8 mm layers
Thermal conductivity	0,078 W/mK

The information in this technical document is based on the latest test information related to this product.

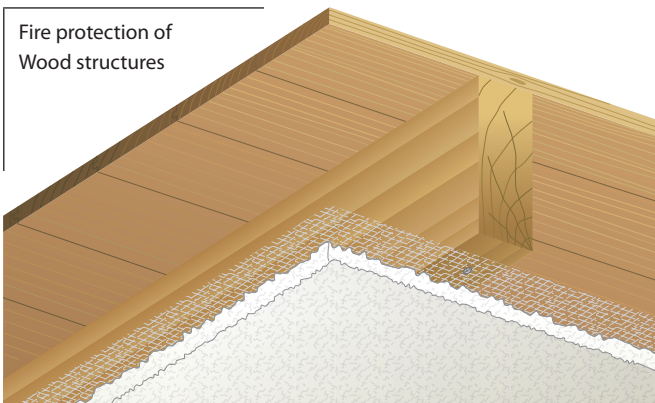
Fire protection of  
concrete structures



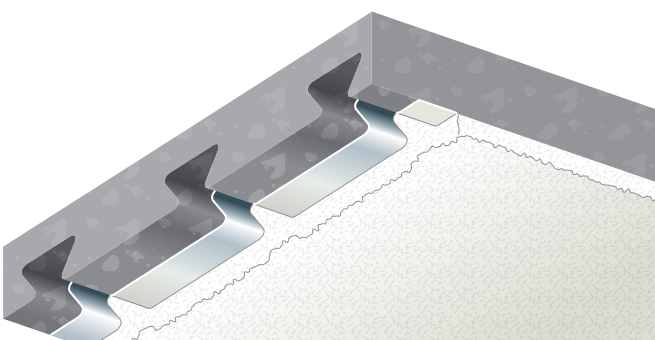
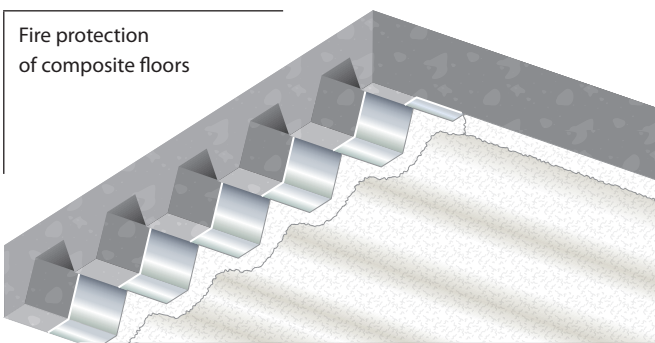
Fire protection of  
steel structures



Fire protection of  
Wood structures



Fire protection  
of composite floors



### Application Fields

- Fire Protection

### Description

PROMASPRAY® F250 is a fibrous mixture used for fire protection and insulation projects.

PROMASPRAY® F250 is a dry mix, lightweight mineral wool based product with cement and other chemical binders, for internal use only.

### Applications

- Floors and concrete structures
- Floor joist and concrete slab
- Composite floors
- Wooden Floors (projection on expanded metal sheet)
- Steel Structures

### Properties and performance

- Resistant to rot and mould
- Noncombustible
- Easy to apply

### Safety

See safety data sheet

For the latest safety data sheet visit [www.promat.nu](http://www.promat.nu)

### Primer

Promat BONDSEAL®

Promat® PSK 101

### Finishing

Smoothing, rolling or untreated

### Packaging and Storage

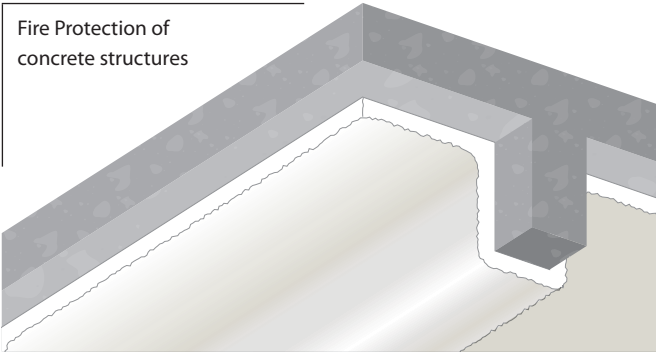
- Shelf life: 12 months maximum from date of production in unopened packaging.
- Storage conditions: Protect from frost, moisture, excessive heat and permanent sunlight.
- Packaging: plastic bag of 20 kg.
- Pallet: 30 bags per pallet is 600 kg.
- Waste disposal: Do not discharge into drains, streams or soil. Use the trash bags provided for this purpose.

### Specification

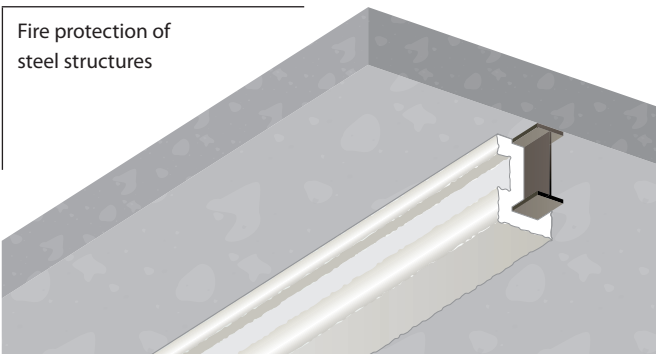
Color	Offwhite
Appearance	Rolled or smoothened
Density	Fire resistance: 200 kg/m <sup>3</sup> - 240 kg/m <sup>3</sup> Thermal insulation: 145 kg/m <sup>3</sup> - 160 kg/m <sup>3</sup>
Reaction to fire	A1 - Report SINTEF 102010.02/09.024A
pH	10
Initial setting time	24 hours at 20 °C and 50 HR
Binding type	By hydraulic
Application temperature	from 4°C to 45 °C
Low biopersistence	According to Directive CE 97/69
Number of layers	One or more if needed Minimum 10 mm layers
Thermal conductivity	0,043 W/mK

The information in this technical document is based on the latest test information related to this product.

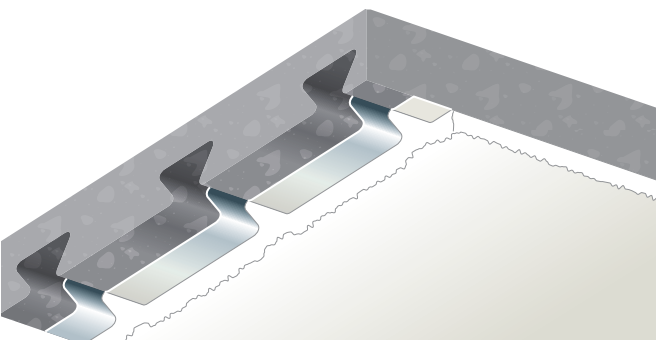
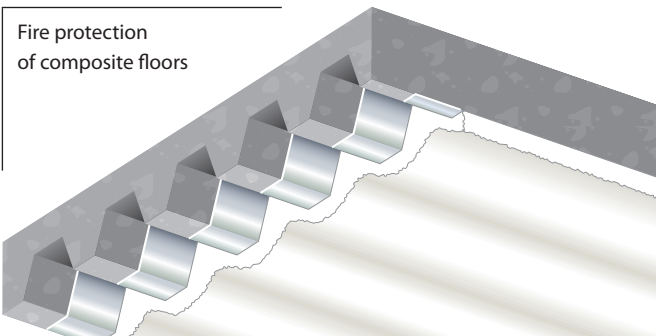
Fire Protection of concrete structures



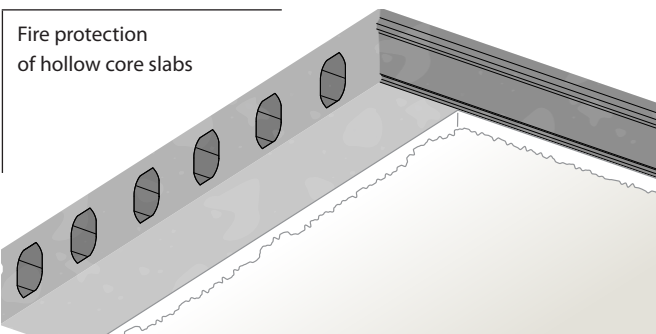
Fire protection of steel structures



Fire protection of composite floors



Fire protection of hollow core slabs



### Application Fields

- Fire Protection

### Description

PROMASPRAY® C450 is a spray applied, single package factory controlled premix, based on vermiculite and Portland cement, for internal and semi-exposed use.

PROMASPRAY® C450 produces a monolithic coating able to withstand the thermal shocks experienced in a high intensity cellulosic fire. Concrete structures in particular, will be protected from explosive spalling when coated with PROMASPRAY® C450.

### Applications

- Concrete structures
- Concrete slabs steel plate collaborating
- Steel Structures
- Hollow core slabs

### Properties and performance

- Resistant to rot and mould
- Non-combustible
- Easy to applicate
- Can be used semi-exposed and indoors
- Use Promat TOPCOAT 200 to obtain a more water resistant surface. With Promat TOPCOAT 200, PROMASPRAY® C450 is still only usable in internal and semi-exposed conditions.

### Safety

See safety data sheet

For latest safety data sheet visit [www.promat.nu](http://www.promat.nu)

### Primer

Promat SBR Bonding Latex

Promat PSK 101

### Finish

Promat TOPCOAT 200 or untreated

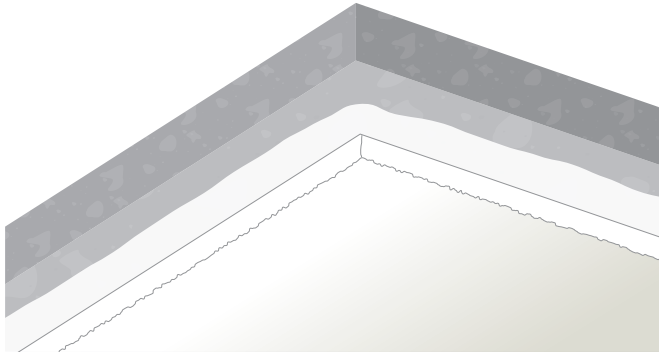
### Packaging and Storage

- Shelf Life: 12 months maximum from date of production in unopened packaging.
- Storage conditions: Protect from frost, moisture, excessive heat and permanent sunlight.
- Packaging: plastic bag of 12,5 kg.
- Pallet: 35 bags per pallet or 437,5 kg.
- Waste disposal: Do not discharge into drains, streams or soil. Use the

### Specification

Color	Grey
Appearance	Raw projection / Finished with Promat - TOPCOAT 200
Density	390 kg/m <sup>3</sup> ±15 % without accelerator
Reaction to fire	A1
pH	12 - 12,5
Initial setting time	2 to 6 hours at 25 °C and 50 % HR without
Binding type	By hydraulic
Application temperature	Start: 2 °C and rising Stop: 4 °C and dropping Max temperature 45 °C
Number of layers	One or more if needed Minimum 8 mm layers
Thermal conductivity	0,095 W/mK

The information in this technical document is based on the latest test information related to this product.



### Specification

Color	Transparent when dry
Weight	1,1 kg/l
pH	9,6
Consumption	Depends on the surface, see manual
Application Temperature	4 °C to 45 °C
Time of film formation	Around 45 minutes at 20 °C / 60 % HR
Drying time at 20 °C and 60 % HR	2 hours (dry in touch) 6 days completely dry
Number of layers	One or more if needed
Reaction to fire	-
The information in this technical document is based on the latest test information related to this product.	

### Application Fields

- Adhesive primer for concrete and steel elements

### Description

Promat BONDSEAL® is a single pack, styrene acrylic copolymer, used as an adhesive/sealer coat. Promat BONDSEAL® is used to seal or create a barrier prior to the application of PROMASPRAY® P300 or PROMASPRAY® F250.

### Application

Use brush, roller or industrial type airless spray.

Adhesive on concrete: Mix 1 part CAFCO BONDSEAL® and 1 part clean water.

Adhesive on steel: Mix 3 part CAFCO BONDSEAL® and 1 part clean water. Spray surfaces until saturation, when the primary becomes tacky, apply the projection.

### Utilization for dry spray mix

Dilute 10% Promat BONDSEAL® with 90% of clean water.

Spray gun with air and water, keep stirring for preparing the projection.

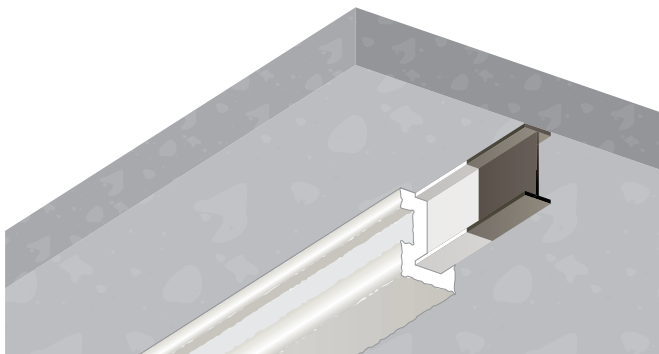
The substrate to be treated should be cleaned thoroughly.

Metal surfaces: Eliminate all traces of dust, loose slag, loose rust, oil, visible moisture.

Concrete support: Eliminate all traces of dust and remove all inflorescence and salt peter.

### Packaging and Storage

- Shelf life: up to 6 months in original containers tightly closed.
- Storage conditions: Store indoors in dry conditions between 5 and 45 °C.
- 20/60 L drums
- Waste disposal: Do not discharge into drains, streams or soil.



### Specification

Color	Dark green
Weight	1,25 ±0,1kg/l
Consumption	0,125 l/m² at 150 µ
Temperature of application	Start: 2 °C and rising Stop: 4 °C and dropping Max temperature 45 °C
Drying time at 20 °C and 60% RH	2 - 6 hours
Number of layers	One or more if needed
Reaction to fire	-
The information in this technical document is based on the latest test information related to this product.	

### Application Fields

- Primer for steel elements

### Description

Promat® PSK 101 is a single pack, multipurpose synthetic latex, water based emulsion for use as a sealer and keycoat as a component of the PROMASPRAY® C450 and PROMASPRAY® F250 fire protective coating system.

### Application

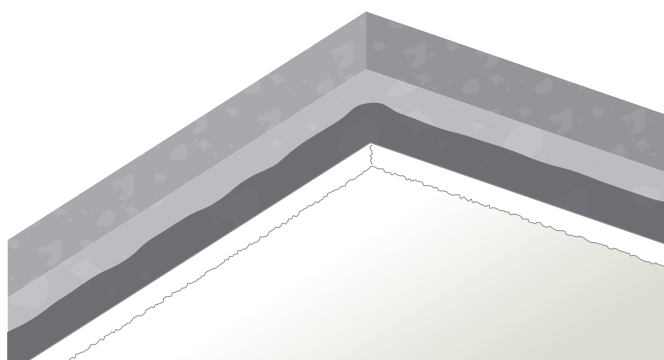
Use brush, roller or industrial type airless spray.

Stir Promat® PSK 101 before use (do not dilute) and apply with an industrial type airless spray or lambswool roller. Promat® PSK 101 may also be applied with a wide nylon or bristle brush in small (maximum 1m²) areas only.

The substrate must be clean, dry and free from dust, loose slag, loose rust, oil, visible moisture (including condensation) and any other contaminants that may interfere with proper adhesion.

### Packaging and Storage

- Shelf life: up to 6 months in original containers tightly closed.
- Storage conditions: Store indoors in dry conditions between 5 and 45 °C.
- 20 l metal pails.
- Protect from freezing.
- Waste disposal: Do not discharge into drains, streams or soil.



### Specification

Color	-
Weight	1 ±0,1kg/l
pH	10 ±0,5
Coloration	On site or to the manufacture
Consumption	1,5 to 1,7 kg/m <sup>2</sup> of prepared keycoat
Temperature of application	Start: 2 °C and rising Stop: 4 °C and dropping Max temperautre 45 °C
Drying time at 20 ° C and 60% RH	10 - 36 hours
Number of layers	1 or more as required
Reaction to fire	-

The information in this technical document is based on the latest test information related to this product.

### Application Fields

- Bonding primer for concrete and steel elements

### Description

Promat® SBR Bonding Latex is a single pack, synthetic latex for use as a keycoat for fire protective coatings.

### Application

Low pressure sprayer - the same type as for all wet mix sprays.

Adhesive on concrete and steel: Mix 1 part Promat® SBR Bonding latex and 1 part clean water. Then add 20 kg PROMASPRAY® FMII to 17 kg of diluted Promat® SBR Bonding latex.

Spray surfaces until coverage of 20-50% , when the primary becomes tacky, apply the projection.

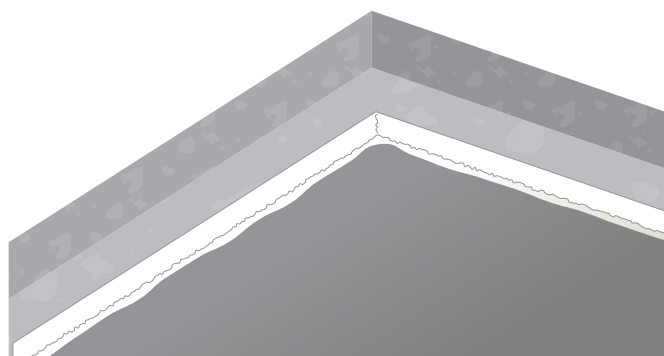
The substrate to be treated should be cleaned thoroughly.

Metal surfaces: Eliminate all traces of dust, loose slag, loose rust, oil, visible moisture.

Concrete support: Eliminate all traces of dust and remove all inflorescence and saltpeter.

### Packaging and Storage

- Storage: up to 6 months in original containers tightly closed.
- Store indoors in dry conditions between 5 and 45° C.
- 20/200 l drums
- Protect from freezing and strong radiant sunlight.
- Waste disposal: Do not discharge into drains, streams or ground.



### Specification

Color	Matt white or grey Contact Promat for other colors
Weight	1,4 ±0,1kg/l
pH	8,5 ±0,5
Coloration	On site or to the manufacture
Consumption	0,2 l/m <sup>2</sup> at 200 µ
Temperature of application	Start: 5 °C and rising Stop: 5 °C and dropping Max temperautre 45 °C
Drying time at 20 ° C and 60% RH	2 - 6 hours
Number of layers	2 or more as required
Reaction to fire	-

The information in this technical document is based on the latest test information related to this product.

### Application Fields

- Finish coat for concrete coatings

### Description

Promat® TOPCOAT 200 is a single pack, water based acrylic polymer for use as a water vapour permeable topcoat with excellent adhesion.

### Application

Use brush, roller or industrial type airless spray.

Stir Promat® TOPCOAT 200 before use (do not dilute) and apply with an industrial type airless spray or lambswool roller. The latter is not recommended on heavily textured surfaces Promat® TOPCOAT 200 may also be applied with a wide nylon or bristle brush in small (maximum 1m<sup>2</sup>) areas only.

The substrate to be treated should be cleaned thoroughly.

Eliminate all traces of oil, grease, visible moisture, dirt, dust and mould.

### Packaging and Storage

- Storage: up to 6 months in original containers tightly closed.
- Store indoors in dry conditions between 5 and 45° C.
- 25 l metal palls.
- Protect from freezing.
- Waste disposal: Do not discharge into drains, streams or ground.



### General

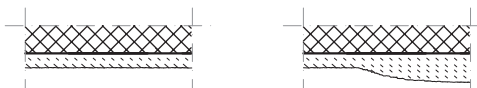
Fire protection of concrete slabs is based around preserving the load bearing capacity of the slab and/or the integrity and insulating properties. The fire protection prevents the temperature at the reinforcement to exceed the point where it loses its strength, and prevents that the temperature on the other side of the slab is below regulation requirements. The critical temperatures of the steel reinforcement can vary, and it is project specific what the critical temperature is.

- The surface must be clean, dry, dust free, free from oil and other contaminants that may interfere with proper adhesion.
- The appropriate primer should be implemented before applying the coating fire protection (see page 4-6).

For hollow core slabs, look in Table 6 on page 12. There is no calculation required to obtain the thickness of spray needed to protect the slab, simply just look in the table for the required fire resistance.

### Application

For general application guidelines see page 2 or Tips & Tricks page 22.



Correct



Wrong

It is very important to have a uniform layer thickness, to obtain the correct fire resistance on the entire slab.

Depending on which type of spray is being applied to the concrete slab, the spray nozzle must be held at different angles against the subject that needs protection.

#### PROMASPRAY® C450:

Spray the product in an 90° degree angle against the substrate, to obtain the best stickability of the product, the best even thickness and to reduce waste material.

Keep the spray nozzle at a distance of 0,3-0,6 m to the substrate.

#### PROMASPRAY® P300:

Spray the product in an 90° degree angle against the substrate, to obtain the best stickability of the product, the best even thickness and to reduce waste material.

Keep the spray nozzle at a distance of 0,3-0,6 m to the substrate.



#### PROMASPRAY® F250:

Spray the product in an 90° degree angle against the substrate, to obtain the best stickability of the product, the best even thickness and to reduce waste material.

Keep the spray nozzle at a distance of 1-1,6 m to the substrate.

#### Calculation method

The correct thickness of fire protective spray is determined based on Eurocode 2.

The Tables 1 and 2 can be found in Eurocode 2 5.8-5.11.

To determine the thickness of spray, first look up the type of concrete slab that has to be protected. When the correct slab type has been found, calculate the largest of either  $h_s$ ,  $a_{sd}$  or  $a$ .

To calculate  $h_s$ ,  $a_{sd}$  and  $a$ , find the corresponding minimum size of  $h_s$ ,  $a_{sd}$  or  $a$  for the needed slab type in Table 1-2. When the minimum size is defined, subtract the actual dimensions of the slab, as it has been designed.

When calculating flat slabs look through Tables 3-5 for thickness of spray.

When calculating beams look through Tables 7-9 for thickness of spray.

The distance  $a$  is measured from the center of the reinforcement, to the bottom of the concrete.

#### Conditions of validity

- Thickness of slabs or walls greater or equal to 120 mm
- Width of beam greater or equal to 150 mm
- Weight of concrete greater than or equal to 2305 kg/m<sup>3</sup> +/-15%
- Concrete slab cast with use of mineral oil or emulsion as release agent.
- In case of light weight concrete, contact Promats Technical department.

#### Important note

This calculation is only for determining the fire protection of the slab. This dimensioning doesn't take into account, the strength and load bearing capabilities of the slab.

This has to be calculated by other party.

These calculations doesn't take into account, spalling of the concrete.

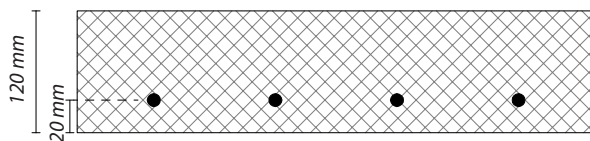
These calculations is based on a critical temperature of 500 °C on the reinforcement.

If the correct type of concrete slab is not found in the following section, or for different critical steel temperature, please contact Promats Technical department for further assistance.



### Step 1

Identify the slab and dimensions, as showed on the drawing.  
See page 12.



### Step 2

Identify the required dimensions according to Eurocode 2.

#### Minimum requirements for REI 120

Look up the minimum dimensions in Table 1 on page 12.

As read in the table the following dimensions are required to obtain REI 120.

$h_s$ : minimum 120 mm

$a$ : minimum 40 mm

Standard fire resistance	Minimum dimensions of concrete slab			
	Min. slab thickness $h_s$ [mm]	Min. axis distance $a$ [mm]		
		1 span direction	2 span directions	
			$l_y/l_x \leq 1,5$	$1,5 < l_y/l_x \leq 2$
REI 30	60	10	10	10
REI 60	80	20	10	15
REI 90	100	30	15	20
REI 120	120	40	20	25
REI 180	150	55	30	40
REI 240	175	65	40	50

Minimum dimensions of flat slabs - Table 1 taken from page 12

### Step 3

Identifying the required thickness of spray to protect the slab.

Look up the equivalent thickness of concrete in the tables on page 13.

Fire resistance	PROMASPRAY C450 thickness				
	Largest of the dimensions $h_s, a_{sd}$ or $a$				
	14 mm	20 mm	30 mm	40 mm	54 mm
REI 30	0-33	34-38	35-46	47-54	55-66
REI 60	0-43	44-49	50-60	61-70	71-85
REI 90	0-46	47-52	53-62	63-71	72-85
REI 120	0-46	47-52	53-62	63-71	72-85
REI 180	0-45	46-51	52-61	62-71	72-85

Slabs - Table 5 taken from page 13

Slab thickness  $h_s$ : 120 mm required - 120 mm actual thickness = equivalent to 0 mm concrete is needed.

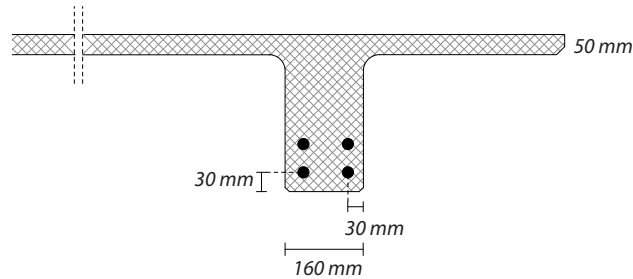
The greater of these two numbers is 20 mm. Search through the graphs on page 13, and find the required thickness.

Axis distance  $a$ : 40 mm required - 20 mm actual distance = equivalent to 20 mm concrete is needed.

Bottom of slab: 14 mm PROMASPRAY® C450

#### Step 1

Identify the slab and all dimensions, as showed on the drawing.  
See page 13.



#### Step 2

Identify the required dimensions according to Eurocode 2.

##### Minimum requirements for REI 120

Look up the minimum dimensions in Table 2 on page 12.  
In Table 2, look up which combination of dimension  $b$  and dimension  $a$  is the most fitting. In this case, column 1 is the most fitting, with a minimum dimension of  $b = 160$  mm.

As read in the table the following dimensions is required to obtain REI 120.  
 $h_s$ : minimum 120 mm  
 $a$  in beam: minimum 60 mm  
 $b$ : minimum 160 mm  
 $a_{sd}$ :  $60 + 10$  mm = 70 mm

Standard fire resistance	Minimum dimensions of concrete slab			Min. slab thickness $h_s$ and distance $a$ in flange [mm]
	Possible combinations of width of ribs $b$ and axis distance $a$ [mm]			
	1	2	3	
REI 30	$b = 80$ $a = 15$			$h_s = 80$ $a = 10$
REI 60	$b = 100$ $a = 35$	$b = 120$ $a = 25$	$b \geq 200$ $a = 15$	$h_s = 80$ $a = 10$
REI 90	$b = 120$ $a = 45$	$b = 160$ $a = 40$	$b \geq 250$ $a = 30$	$h_s = 100$ $a = 15$
REI 120	$b = 160$ $a = 60$	$b = 190$ $a = 55$	$b \geq 300$ $a = 40$	$h_s = 120$ $a = 20$

Minimum dimensions of ribbed slabs - Table 2 taken from page 12

#### Step 3

Identifying the required thickness of spray to protect the slab.  
Look up the equivalent thickness of concrete in the tables on page 13-14.

Fire resistance	PROMASPRAY C450 thickness				
	Largest of the dimensions $h_s$ , $a_{sd}$ or $a$				
	14 mm	20 mm	30 mm	40 mm	54 mm
REI 30	0-33	34-38	35-46	47-54	55-66
REI 60	0-43	44-49	50-60	61-70	71-85
REI 90	0-46	47-52	53-62	63-71	72-85
REI 120	0-46	47-52	53-62	63-71	72-85
REI 180	0-45	46-51	52-61	62-71	72-85

Slabs - Table 5 taken from page 13

Fire resistance	PROMASPRAY C450 thickness				
	Largest of the dimensions $h_s$ , $a_{sd}$ or $a$				
	19 mm	25 mm	35 mm	45 mm	54 mm
REI 30	0-17	18	19-20	21	22-23
REI 60	0-39	40-44	45-52	53-62	63-69
REI 90	0-51	52-54	55-60	61-64	65-78
REI 120	0-52	53-58	59-68	69-78	79-88
REI 180	0-50	51-60	61-78	79-96	97-111

Beams - Table 9 taken from page 14

Slab thickness  $h_s$ : 120 mm required - 50 mm actual thickness = equivalent to 70 mm concrete is needed.

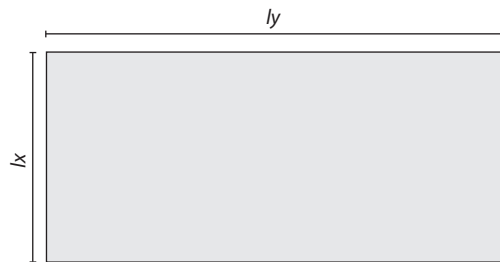
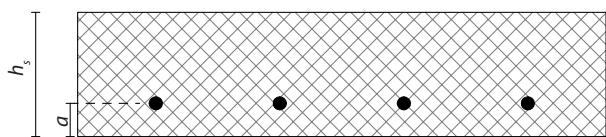
Axis distance  $a$ : 60 mm required - 30 mm actual distance = equivalent to 30 mm concrete is needed.

Axis distance  $a_{sd}$ :  $60+10$  mm required - 30 mm actual distance = equivalent to 40 mm concrete is needed.

Bottom of slab  $h_s$ : 40 mm PROMASPRAY® C450

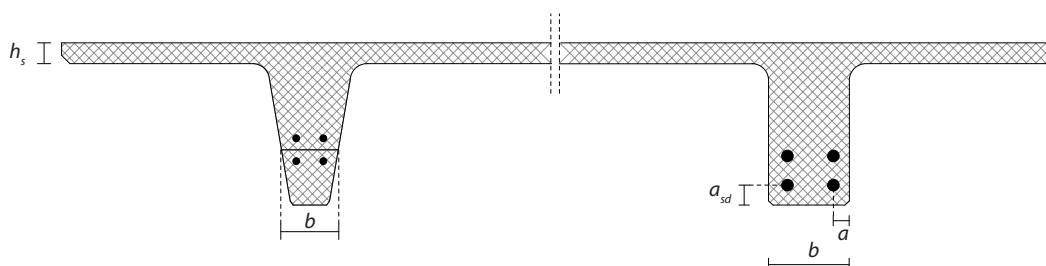
Sides of beam  $a$ : 19 mm PROMASPRAY® C450

Bottom of beam  $a_{sd}$ : 19 mm PROMASPRAY® C450



Standard fire resistance	Minimum dimensions of concrete slab			
	Min. slab thickness $h_s$ [mm]	Min. axis distance $a$ [mm]		
		1 span direction	2 span directions	
			$l_y/l_x \leq 1,5$	$1,5 < l_y/l_x \leq 2$
REI 30	60	10	10	10
REI 60	80	20	10	15
REI 90	100	30	15	20
REI 120	120	40	20	25
REI 180	150	55	30	40
REI 240	175	65	40	50

Table 1



Standard fire resistance	Possible combinations of width of ribs $b$ and axis distance $a$ [mm]			Min. slab thickness $h_s$ and axis distance $a$ in flange [mm]
	1	2	3	
	REI 30	$b = 80$ $a = 15$		
REI 60	$b = 100$ $a = 35$	$b = 120$ $a = 25$	$b \geq 200$ $a = 15$	$h_s = 80$ $a = 10$
REI 90	$b = 120$ $a = 45$	$b = 160$ $a = 40$	$b \geq 250$ $a = 30$	$h_s = 100$ $a = 15$
REI 120	$b = 160$ $a = 60$	$b = 190$ $a = 55$	$b \geq 300$ $a = 40$	$h_s = 120$ $a = 20$
REI 180	$b = 220$ $a = 75$	$b = 260$ $a = 70$	$b \geq 410$ $a = 60$	$h_s = 150$ $a = 30$
REI 240	$b = 280$ $a = 90$	$b = 350$ $a = 75$	$b \geq 500$ $a = 70$	$h_s = 175$ $a = 40$
$a_{sd} = a + 10$				

Table 2

### PROMASPRAY F250

- Thickness of protection between 14 and 36 mm.
- When applied to concrete structures, apply substrate with Promat BONDSEAL® first.
- Apply to flat slabs, ribbed slabs and walls exposed on one side only.

Fire resistance	PROMASPRAY F250 thickness			
	Largest of the dimensions $h_s$ , $a_{sd}$ or $a$			
	14 mm	20 mm	30 mm	36 mm
REI 30	0-45	46-50	51-58	59-62
REI 60	0-56	57-62	63-72	73-78
REI 90	0-57	58-65	66-78	79-86
REI 120	0-54	55-65	66-82	83-94
REI 180	0-47	48-61	62-84	85-99

Table 3

### PROMASPRAY P300

- Thickness of protection between 10 and 50mm.
- When applied to concrete structures, apply substrate with Promat BONDSEAL® first.
- Apply to flat slabs, ribbed slabs and walls exposed on one side only.

Fire resistance	PROMASPRAY P300 thickness				
	Largest of the dimensions $h_s$ , $a_{sd}$ or $a$				
	10 mm	20 mm	30 mm	40 mm	50 mm
REI 30	0-33	34-46	47-59	60-72	73-85
REI 60	0-40	41-51	52-63	64-74	75-85
REI 90	0-41	42-52	53-63	64-74	75-85
REI 120	0-40	41-51	52-62	63-74	75-85

Table 4

### PROMASPRAY C450

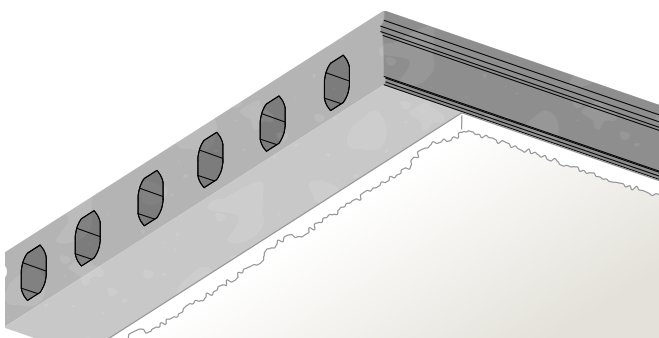
- Thickness of protection between 14 and 54 mm.
- When applied to concrete structures, apply substrate with Promat SBR Bonding latex first.
- Apply to flat slabs, ribbed slabs and walls exposed on one side only.
- For water repellent finish, apply Promat TOPCOAT 200 to finished spray. When TOPCOAT 200 is applied to PROMASPRAY C450, it is still only usable in semi-exposed conditions.

Fire resistance	PROMASPRAY C450 thickness				
	Largest of the dimensions $h_s$ , $a_{sd}$ or $a$				
	14 mm	20 mm	30 mm	40 mm	54 mm
REI 30	0-33	34-38	35-46	47-54	55-66
REI 60	0-43	44-49	50-60	61-70	71-85
REI 90	0-46	47-52	53-62	63-71	72-85
REI 120	0-46	47-52	53-62	63-71	72-85
REI 180	0-45	46-51	52-61	62-71	72-85

Table 5

### PROMASPRAY C450

- Thickness of protection between 9 and 39 mm.
- Apply substrate with Promat BONDSEAL® first.
- Critical temperature of hollow core slab 200 °C or 400°C.



Fire resistance	PROMASPRAY C450 thickness	
	Critical temperature	
	200 °C	400 °C
REI 30	-	9 mm
REI 60	17 mm	9 mm
REI 90	25 mm	9 mm
REI 120	32 mm	12 mm
REI 180	39 mm	17 mm
REI 240	-	22 mm

Table 6

### PROMASPRAY F250

- Thickness of protection between 17 and 48 mm.
- When applied to concrete structures, apply substrate with Promat BONDSEAL® first.
- Apply to flat rectangular beams

Fire resistance	PROMASPRAY F250 thickness				
	Largest of the dimensions $h_s$ , $a_{sd}$ or $a$				
	17 mm	20 mm	30 mm	40 mm	48 mm
REI 30	0-33	34-35	36-42	43-50	51-54
REI 60	0-45	46-48	49-56	57-65	66-70
REI 90	0-58	59-60	61-67	68-73	74-77
REI 120	0-65	66-68	69-77	78-86	87-91
REI 180	0-60	61-65	66-79	80-95	96-104

Table 7

### PROMASPRAY P300

- Thickness of protection between 9 and 49 mm.
- When applied to concrete structures, apply substrate with Promat BONDSEAL® first.
- Apply to flat rectangular beams

Fire resistance	PROMASPRAY P300 thickness				
	Largest of the dimensions $h_s$ , $a_{sd}$ or $a$				
	9 mm	20 mm	30 mm	40 mm	49 mm
REI 30	0-10	11-14	15-17	18-21	22-24
REI 60	0-27	28-40	41-52	53-62	63-74
REI 90	0-25	26-40	41-54	55-68	69-80
REI 120	-	-	0-20	21-54	55-87

Table 8

### PROMASPRAY C450

- Thickness of protection between 19 and 54 mm.
- When applied to concrete structures, apply substrate with Promat SBR Bonding latex® first.
- Apply to flat rectangular beams
- For water repellent finish, apply Promat TOPCOAT 200 to finished spray.

Fire resistance	PROMASPRAY C450 thickness				
	Largest of the dimensions $h_s$ , $a_{sd}$ or $a$				
	19 mm	25 mm	35 mm	45 mm	54 mm
REI 30	0-17	18	19-20	21	22-23
REI 60	0-39	40-44	45-52	53-62	63-69
REI 90	0-51	52-54	55-60	61-64	65-78
REI 120	0-52	53-58	59-68	69-78	79-88
REI 180	0-50	51-60	61-78	79-96	97-111

Table 9

### General

Fire protection of steel is based around preserving the load bearing capacity of the steel.

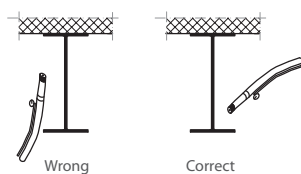
The protection is keeping the temperature of the steel lower than a point, where the steel cannot carry the desired load anymore.

There are a lot of different critical temperatures for steel, and it is project specific what the critical temperature is.

- The steel construction to be protected can be untreated or treated against rust, although our products do not promote the corrosion of steel, a surface treated with a primer is recommended for corrosion resistance for a long period. For other types of support, consult Promat Technical Services.
- The surface must be clean, dry, dust free, free from rust, oil and other contaminants that may interfere with proper adhesion. Make sure that galvanised steel profiles are free from zinc salts.
- The appropriate primer should be implemented before applying the coating fire protection (see page 4-6).

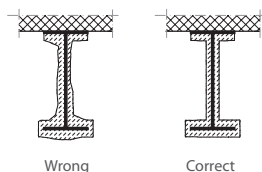
### Application

For general application guidelines see page 2.



When spraying a steel profile it is very important to get a uniform layer all around the steel profile. This is done easiest as shown in this drawing.

If the profiles do not have a uniform spray thickness, it can compromise the fire resistance of the steel profile.



For further assistance, contact Promat technical department, or visit [www.promat.nu](http://www.promat.nu) for digital application manuals.

### Calculation method

The correct thickness can be calculated according to the F/A value and from the fire classification of the profile, R 30 - R 240.

The F/A value is obtained as a result of the exposed surface of the steel (F) and the steel's cross section area (A). The higher the F/A value, the faster the steel is heated, and a thicker layer of fire protection is needed.

When the value of F is calculated, the surfaces of the profile which faces another building component, with the same or higher fire resistance, is not taken into account.

This also applies to faces of the profile, which are built into a fire resistant building component.

To calculate the amount of spray needed for a project, calculate the surface area of the profile. This is done by calculating the perimeter of the surface, and then multiplying the perimeter with the length of the profile.

Adhesive: Steel profile area x amount per m<sup>2</sup> + additionally 20 %

Spray product: Steel profile area x amount per m<sup>2</sup> + additionally 2-20 %

Topcoat: Sprayed profile area x amount per m<sup>2</sup>. Note that the perimeter has changed after the application of the spray.

The material consumption can vary.

### Important note

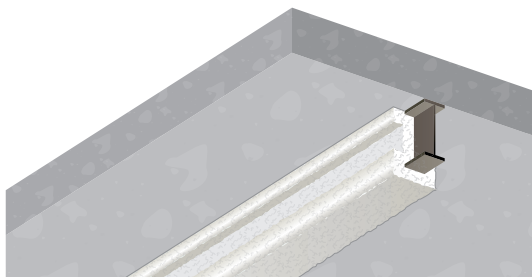
For thicknesses with critical temperatures different than the ones mentioned, or profile types not listed in the tables 10-11, contact our Technical Department for further assistance.

Our technical application manual can be obtained at [www.promat.nu](http://www.promat.nu), or by contacting our Technical Department.



Steel beams R 30 to R 240  
critical temperature 550 °C

P.-V. Efectis 07-A-398



### Note

These thicknesses in mm were calculated for a critical temperature of 550 °C.

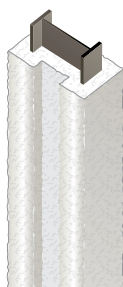
- If the substrate is protected against rust with a primer not compatible with cement, the substrate must be covered with Promat® PSK 101.
- If the substrate is unprimed, no primer is necessary.
- If the substrate is protected against rust with a primer compatible with concrete, the substrate must be covered with Promat® BONDSEAL

3 faces	R 30				R 60				R90				R120				R180				R240			
	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN
80	-	-	15	15	-	-	35	33	-	-	54	52	-	-	71	69	-	-	-	-	-	-	-	-
100	15	15	15	15	24	20	32	30	40	35	51	49	56	49	69	66	-	77	-	-	-	-	-	-
120	15	15	15	15	25	19	31	28	41	33	50	45	57	47	67	62	-	74	-	-	-	-	-	-
140	15	15	15	15	23	18	30	25	39	32	48	42	54	45	65	58	-	72	-	-	-	-	-	-
160	15	15	15	15	21	16	28	24	36	28	45	40	51	41	62	56	79	66	-	-	-	-	-	-
180	15	15	15	15	21	16	27	22	35	28	44	37	51	41	61	53	79	66	-	-	-	-	-	-
200	15	15	15	15	20	15	25	21	35	27	42	36	49	39	58	51	77	63	-	79	-	-	-	-
220	15	15	15	15	19	15	25	20	33	25	41	35	47	36	57	49	74	60	-	77	-	-	-	-
240	15	15	15	15	17	15	23	19	30	23	39	33	43	34	54	47	69	56	-	74	-	78	-	-
260	15	15	-	15	17	15	-	17	30	23	-	30	43	34	-	43	69	56	-	69	-	78	-	-
280	15	15	-	15	16	15	-	16	28	23	-	28	41	34	-	41	66	56	-	66	-	78	-	-
300	15	15	15	15	15	15	21	16	27	21	36	28	39	31	51	41	63	52	79	66	-	73	-	-
320	15	15	-	15	15	15	-	15	25	21	-	27	36	31	-	39	60	52	-	63	-	73	-	-
340	15	15	-	15	15	15	-	15	25	19	-	25	36	28	-	36	60	48	-	60	-	68	-	-
360	15	15	15	15	15	15	19	15	23	19	33	23	36	28	47	34	56	48	74	56	78	68	-	78
400	15	15	15	15	15	15	18	15	23	19	32	21	34	28	45	31	56	48	72	52	78	68	-	73
450	15	15	15	15	15	15	17	15	21	17	30	19	31	26	43	28	52	44	69	48	73	62	-	68
500	15	15	15	15	15	15	16	15	21	17	28	19	31	26	41	28	52	44	66	48	73	62	-	68
550	15	15	15	15	15	15	15	15	21	17	27	17	31	26	39	26	52	44	63	44	73	62	-	62
600	15	15	15	15	15	15	15	15	19	17	25	15	28	26	36	23	48	44	60	39	68	62	-	56

Table 10

Steel beams R 30 to R 180  
critical temperature 470 °C

P.-V. Efectis 07-A-398



### Note

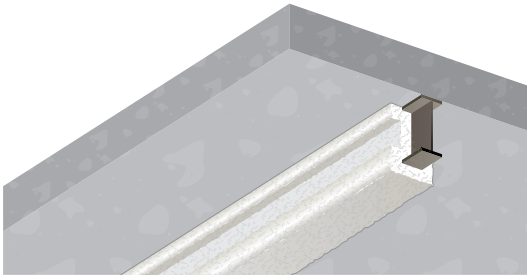
These thicknesses in mm were calculated for a critical temperature of 470 °C.

- If the substrate is protected against rust with a primer not compatible with cement, the substrate must be covered with Promat® PSK 101.
- If the substrate is unprimed, no primer is necessary.
- If the substrate is protected against rust with a primer compatible with concrete, the substrate must be covered with Promat® BONDSEAL

3 faces	R 30				R 60				R90				R120				R180							
	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN				
80	-	-	-	19	-	-	-	43	-	-	-	65	-	-	-	-	-	-	-	-	-	-	-	-
100	15	15	18	17	34	29	42	40	54	49	64	61	73	67	-	-	-	-	-	-	-	-	-	-
120	15	15	17	15	34	29	40	37	54	47	62	58	73	65	-	77	-	-	-	-	-	-	-	-
140	15	15	16	15	33	27	39	35	53	45	60	55	72	62	79	74	-	-	-	-	-	-	-	-
160	15	15	15	15	32	25	37	33	51	41	58	53	70	58	77	72	-	-	-	-	-	-	-	-
180	15	15	15	15	30	23	36	30	50	39	57	50	68	56	76	68	-	-	-	-	-	-	-	-
200	15	15	15	15	29	22	35	29	49	38	55	49	67	54	74	68	-	-	-	-	-	-	-	-
220	15	15	15	15	27	21	33	27	46	36	53	46	64	51	72	64	-	-	-	-	-	-	-	-
240	15	15	15	15	26	21	32	27	43	36	51	45	60	51	70	62	-	-	-	-	-	-	-	-
260	15	15	-	15	26	19	-	25	43	34	-	41	60	49	-	62	-	-	78	-	-	-	-	-
280	15	15	-	15	25	19	-	23	41	34	-	39	58	49	-	56	-	-	78	-	-	-	-	-
300	15	15	15	15	23	18	29	22	39	32	49	38	56	46	67	54	-	-	74	-	-	-	-	-
320	15	15	-	15	22	17	-	22	38	29	-	38	54	43	-	54	-	-	70	-	-	-	-	-
340	15	15	-	15	21	17	-	21	36	29	-	36	51	43	-	51	-	-	70	-	-	-	-	-
360	15	15	15	15	19	17	27	19	34	29	45	34	49	43	62	49	78	70	-	-	-	78	-	-
400	15	15	15	15	19	15	26	18	34	27	43	21	49	40	60	46	78	66	-	-	-	74	-	-
450	15	15	15	15	18	15	25	17	32	27	41	29	46	40	58	43	74	66	-	-	-	70	-	-
500	15	15	15	15	17	15	22	15	29	25	38	27	43	37	54	40	70	61	-	-	-	66	-	-
550	15	15	15	15	17	15	22	15	29	25	38	25	43	37	54	37	70	61	-	-	-	61	-	-
600	15	15	15	15	17	15	19	15	29	25	34	25	43	37	49	33	70	61	-	-	-	56	-	-



### Steel beams R 30 to R 240 critical temperature 550 °C



#### Note

These thicknesses in mm were calculated for a critical temperature of 550 °C.

- If the substrate is protected against rust with a primer not compatible with cement, the substrate must be covered with Promat® PSK 101.
- If the substrate is unprimed, no primer is necessary.
- If the substrate is protected against rust with a primer compatible with concrete, the substrate must be covered with Promat® SBR Bonding latex

3 faces	R 30				R 60				R90				R120				R180				R240			
	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN
80	-	-	11	11	-	-	20	20	-	-	29	29	-	-	38	38	-	-	56	56	-	-	-	-
100	10	10	10	10	14	12	19	19	21	19	28	28	28	25	37	36	42	39	55	54	57	52	-	-
120	10	10	10	10	14	11	19	18	21	17	27	26	28	24	36	35	42	37	53	52	57	50	-	-
140	10	10	10	10	13	10	18	17	20	16	26	25	27	22	35	33	41	34	52	50	55	47	-	-
160	10	10	10	10	12	10	17	16	19	15	26	24	26	20	34	32	40	32	51	47	53	43	-	-
180	10	10	10	10	12	10	17	15	19	14	25	23	25	19	33	30	39	29	49	45	52	42	-	-
200	10	10	10	10	11	10	16	14	17	13	24	22	24	16	32	29	37	28	48	44	50	40	-	-
220	10	10	10	10	10	10	16	14	17	12	23	21	23	17	31	28	36	28	47	42	48	38	-	57
240	10	10	10	10	10	10	15	13	15	12	22	20	21	17	30	27	33	28	45	41	45	38	-	55
260	10	10	-	10	10	10	-	13	15	12	-	19	20	17	-	26	32	28	-	40	44	38	-	53
280	10	10	-	10	10	10	-	12	14	12	-	19	19	17	-	25	31	28	-	39	42	38	-	51
300	10	10	10	10	10	10	14	11	13	12	21	17	18	17	28	24	29	28	42	37	40	38	58	50
320	10	10	-	10	10	10	-	11	13	12	-	17	18	17	-	23	28	28	-	35	39	38	-	48
340	10	10	-	10	10	10	-	10	13	12	-	16	17	17	-	22	28	28	-	34	39	38	-	46
360	10	10	10	10	10	10	12	10	12	12	19	15	17	17	26	20	28	28	40	32	38	38	53	43
400	10	10	10	10	10	10	12	10	12	12	19	14	17	17	25	19	28	28	39	31	38	38	52	42
450	10	10	10	10	10	10	11	10	12	12	18	12	17	17	25	17	28	28	38	28	38	38	51	38
500	10	10	10	10	10	10	10	10	12	12	17	12	17	17	23	17	28	28	36	28	38	38	48	38
550	10	10	10	10	10	10	10	10	12	12	16	12	17	17	22	17	28	28	34	28	38	38	47	38
600	10	10	10	10	10	10	10	10	12	12	16	12	17	17	21	17	28	28	28	28	38	38	38	38

### Steel beams R 30 to R 240, critical temperature 470 °C



#### Note

These thicknesses in mm were calculated for a critical temperature of 470 °C.

- If the substrate is protected against rust with a primer not compatible with cement, the substrate must be covered with Promat® PSK 101.
- If the substrate is unprimed, no primer is necessary.
- If the substrate is protected against rust with a primer compatible with concrete, the substrate must be covered with Promat® SBR Bonding latex

4 faces	R 30				R 60				R90				R120				R180				R240			
	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN	HEA	HEB	IPE	IPN
80	-	-	-	14	-	-	-	25	-	-	-	36	-	-	-	47	-	-	-	-	-	-	-	-
100	11	10	14	13	20	18	25	24	30	27	35	35	39	36	46	45	58	53	-	-	-	-	-	-
120	11	10	13	13	20	18	24	23	29	26	34	33	39	35	45	44	57	52	-	-	-	-	-	-
140	10	10	13	12	20	17	23	22	29	25	34	32	38	33	44	42	56	50	-	-	-	-	-	-
160	10	10	13	12	19	16	23	21	28	23	33	31	37	31	43	41	55	47	-	-	-	-	-	-
180	10	10	12	11	19	15	22	20	27	23	32	30	36	30	42	39	54	46	-	-	-	-	-	-
200	10	10	12	10	18	14	22	20	27	21	31	29	35	29	41	38	52	44	-	56	-	58	-	-
220	10	10	11	10	17	13	21	19	25	21	30	28	33	28	40	37	50	42	-	55	-	57	-	-
240	10	10	11	10	16	13	20	18	24	20	29	27	32	27	39	36	48	41	57	53	-	55	-	-
260	10	10	-	10	16	12	-	18	24	20	-	26	32	27	-	35	48	40	-	52	-	54	-	-
280	10	10	-	10	15	12	-	17	23	19	-	25	30	26	-	34	47	39	-	50	-	52	-	-
300	10	10	10	10	15	12	19	16	22	18	28	24	30	25	37	32	45	38	55	48	58	51	-	-
320	10	10	-	10	14	11	-	16	22	18	-	23	29	24	-	31	44	37	-	47	57	50	-	-
340	10	10	-	10	14	11	-	15	21	17	-	22	28	23	-	30	43	36	-	46	56	49	-	-
360	10	10	10	10	13	10	18	14	20	16	27	21	27	22	35	29	41	35	52	44	55	47	-	58
400	10	10	10	10	12	10	17	13	19	16	26	20	26	22	34	27	39	35	51	41	53	47	-	55
450	10	10	10	10	12	10	17	12	18	16	25	18	25	22	33	25	38	35	50	38	51	47	-	51
500	10	10	10	10	12	10	16	11	18	16	24	17	25	22	32	24	38	35	48	36	51	47	-	49
550	10	10	10	10	11	10	15	10	17	16	23	16	24	22	30	22	36	35	46	35	49	47	-	47
600	10	10	10	10	11	10	12	10	17	16	18	16	24	22	25	22	36	35	38	35	49	47	51	47

# Promat Fire protective membranes

## General

The fire resistance of wooden materials and structures is achieved by limiting the rise in temperature of the wood. Indeed, the wood starts to produce flammable substances from 300 °C. This temperature is considered the acceptable limit for wood structures. Fire protection of wood can not be applied directly on it and is absolutely dependent on the placement of a sheet of expanded metal.

The protection consists of steel mesh sheets or equivalent laid perpendicular to the joists (the leaves are arranged side by side with an overlap of 100 mm).

## Important note

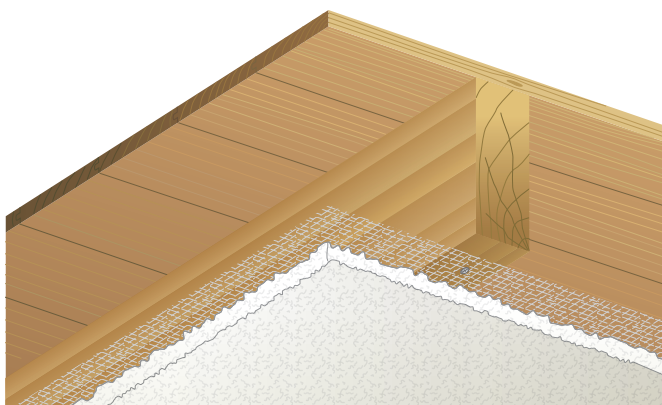
The expanded mesh must overlap each other by minimum 100 mm. The size of the expanded mesh should be equal to 8 mm, and done in galvanized steel.

For further questions contact Promats technical department.

# Promat Fire protection of wooden floors PROMASPRAY® F250

REI 120

P.-V. European CTICM 07-H-427 B



## Conditions of validity:

- Joist spacing less than or equal to 600 mm.
- Height of the joists greater or equal to 220 mm.
- For questions, contact Promat Technical department.

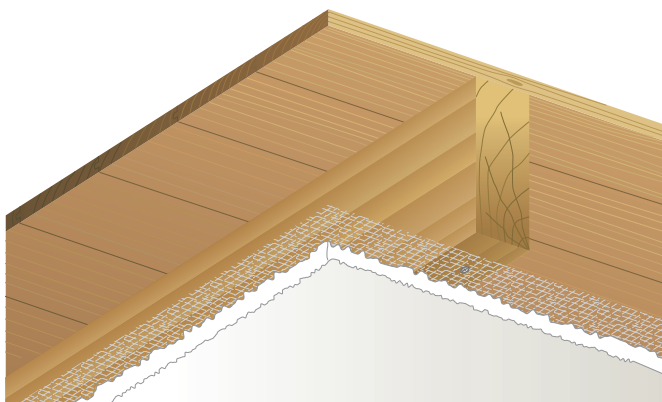
## Thickness required for performance by REI P.-V. European

REI	Thickness PROMASPRAY® F250
120	86 mm

# Promat Fire protection of wooden floors PROMASPRAY® P300

REI 30 to REI 120

P.-V. Efectis 09-H-004B



## Conditions of validity:

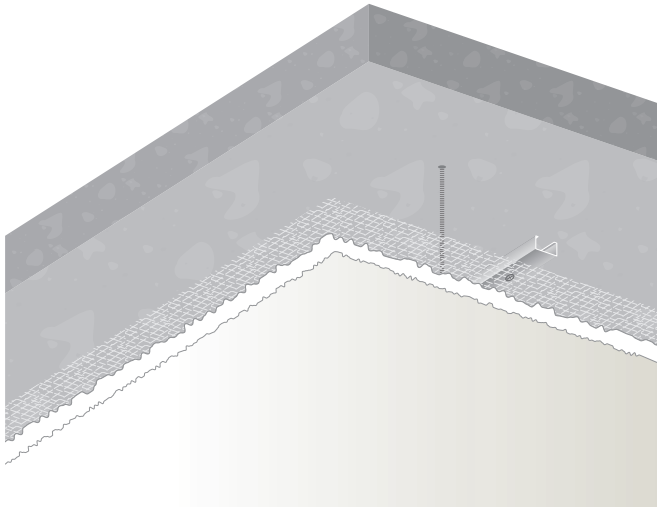
- Joist spacing less than or equal to 600 mm.
- Height of the joists greater or equal to 220 mm.
- For questions, contact Promat Technical department.

## Thickness required for performance REI

REI	Thickness PROMASPRAY® P300
30	22 mm
60	34 mm
90	44 mm
120	52 mm

R/REI 30 to 240

P-V. CTICM 09-H-311

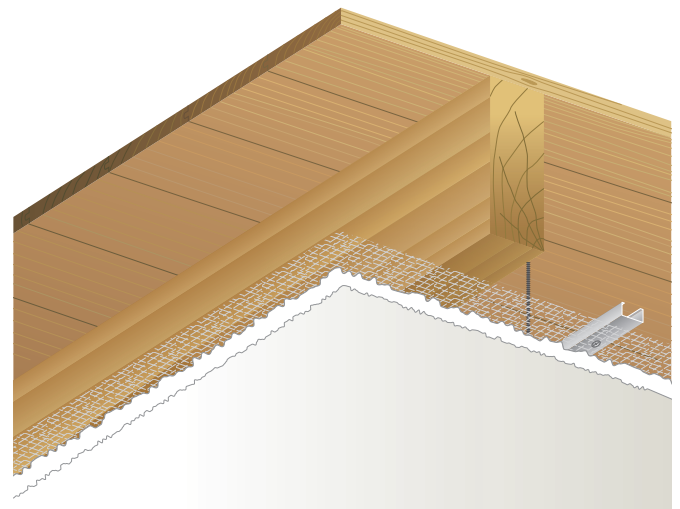
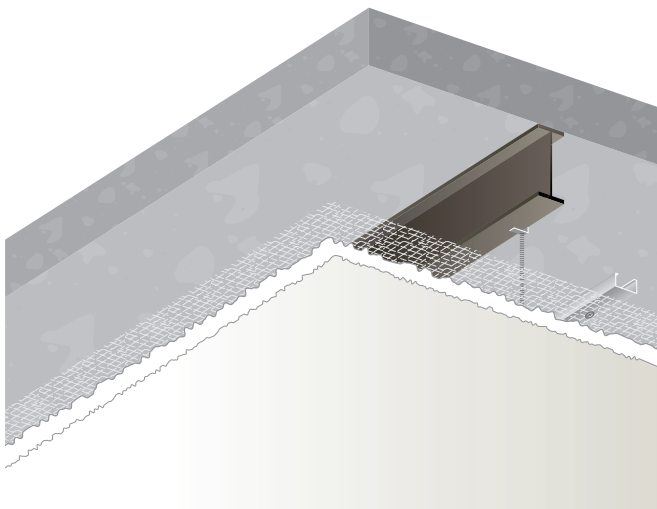


### Conditions of validity

- Thickness of protection between 21 and 55 mm.
- No contact between the top of the horizontal membrane protection implemented with structural elements or fuel.
- No accessories fitted on the underside of the membrane.
- Suspension height less than 190 mm.

### Implementation

- Creation of a framework composed , cc distance 500 mm and threaded rod spacing of 600 mm.
- Fixing the expanded steel mesh with screws
- Direct application of the product



### Thickness required for performance REI

Material Constitution beams and joists	Material Constitution Floor support	Reference temperature (°C)		Minimum thicknesses PROMASPRAY® P300 (mm)					
		Surface	Load bearing structure	REI 30	REI 60	REI 90	REI 120	REI 180	REI 240
Reinforced concrete	Aerated concrete	600	-	21	21	21	21	21	39
Reinforced concrete	Reinforced concrete	600	-	21	21	21	21	21	39
Steel	Aerated concrete	530	510	21	21	21	21	30	49
Steel	Reinforced concrete	530	510	21	21	21	21	30	49
Reinforced concrete Steel	Concrete tanks Steel collaborating	400	350	21	21	21	33	54	-
Cold rolled steel	Reinforced concrete Aerated concrete Concrete tanks Steel collaborating	370	350	21	21	22	34	55	-
Wood	Aerated concrete	300	-	21	21	33	45	-	-
Wood	Reinforced concrete	300	-	21	21	33	45	-	-
Reinforced concrete	Wood	300	-	21	21	33	45	-	-
Steel	Wood	300	-	21	21	33	45	-	-
Wood	Wood	300	-	21	21	33	45	-	-

### Thickness required for performance R

Material Constitution beams and joists	Material Constitution Floor support	Reference temperature (°C)		Minimum thicknesses PROMASPRAY® P300 (mm)					
		Surface	Load bearing structure	R 30	R 60	R 90	R 120	R 180	R 240
Steel	Steel	530	510	21	21	21	21	30	49

### General

The challenges of fire protecting composite slabs is basically the same as, when protecting a reinforced concrete slabs.

The temperature of the steel may not exceed a defined temperature, where at this point, the steel loses most of its strength.

Promat offers two solutions for protection of composite slabs:

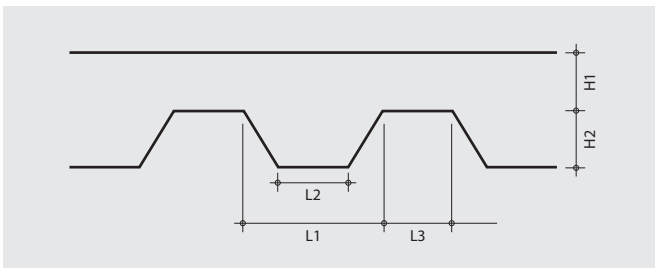
- Protection with a dry mix spray
- Protection with a wet mix spray

To read about the differences in these spray types, see page 2.

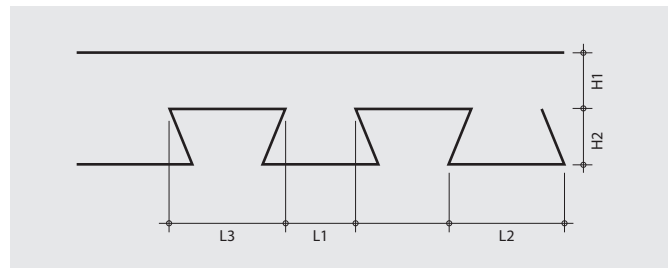
$$* \text{ Effective thickness} = H1 + \frac{H2 \times (L1 + L2) / 2}{L1 + L3}$$



### Trapezoidal profile

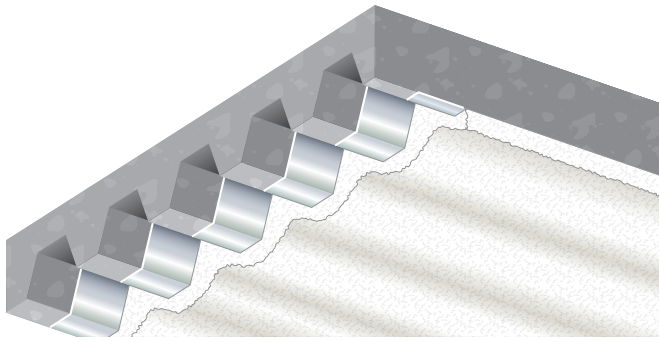


### Re-entrant profile



REI 30 to 180

P-V. Efectis 09-F-145



### Required thickness on trapezoidal profiled slabs

REI	Thickness PROMASPRAY® F250
30	13 mm
60	15 mm
90	23 mm
120	31 mm

### Required thickness on re-entrant profiled slabs

REI	Thickness PROMASPRAY® F250
30	23 mm
60	23 mm
90	23 mm
120	27 mm
180	39 mm

### Implementation

Cleaning of steel.

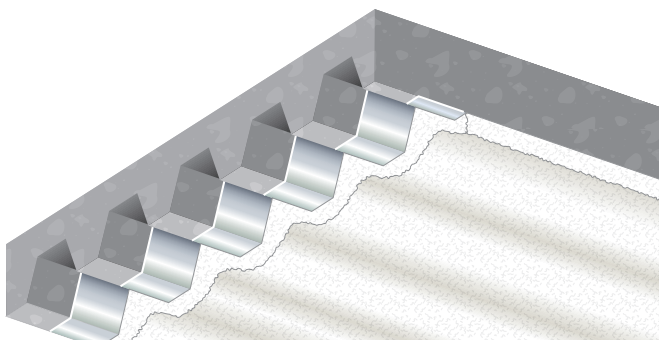
Application of primer.

Projection PROMASPRAY® F250 in one or several passes to obtain the average thickness required by the minutes.

### Conditions of validity

- 13 to 31 mm on trapezoidal profiled steel sheets.
- 23 to 39 mm on re-entrant profiled steel sheets.
- Thickness of steel profile greater than or equal to 0,75 mm.
- Width of the rib (L2) not greater than 187 mm.
- Height of the rib (H2) not greater than 87 mm.
- Test results applicable on concrete/steel composite slabs with effective slab thickness greater than or equal to 73 mm for trapezoidal profiled slabs.
- Test results applicable on concrete/steel composite slabs with effective slab thickness greater than or equal to 80 mm for re-entrant profiled slabs.

REI 30 to 180



### Required thickness on trapezoidal profiled slabs

REI	Thickness PROMASPRAY® C450
30	15 mm
60	25 mm
90	36 mm
120	46 mm

### Required thickness on re-entrant profiled slabs

REI	Thickness PROMASPRAY® C450
30	11 mm
60	11 mm
90	15 mm
120	24 mm
180	40 mm

### Implementation

Cleaning of steel bins.

Application of primer.

Projection PROMASPRAY® C450 in one or several passes to obtain the average thickness required by the minutes.

### Conditions of validity

- 15 to 46 mm on trapezoidal profiled steel sheets.
- 11 to 40 mm on re-entrant profiled steel sheets.
- Thickness of steel profile greater than or equal to 0,75 mm.
- Weight of concrete greater than or equal to 2305 kg/m<sup>3</sup> +/-15%
- Grade of concrete greater than or equal to class C25-C30
- Width of the rib (L2) not greater than 187 mm.
- Height of the rib (H2) not greater than 87 mm.
- Test results applicable on concrete/steel composite slabs with effective slab thickness greater than or equal to 73 mm for trapezoidal profiled slabs.
- Test results applicable on concrete/steel composite slabs with effective slab thickness greater than or equal to 80 mm for re-entrant profiled slabs.

**Application: Upgrading of 6.000 m<sup>2</sup> concrete slabs and beams**

**Product: PROMASPRAY® F250**

**Date: February 2011**

**Location: Helsinki, Finland**

In the beginning of 2011, this library has undergone renovation and a new extension will also be built.

The size of the library is approx. 15.000 m<sup>2</sup>, and a new building of 11.000 m<sup>2</sup> will be added.

In the basement of a library building in Helsinki, Finland 6000m<sup>2</sup> of concrete slabs and beams has been fire protected with PROMASPRAY F250. The grey colour of PROMASPRAY F250 will be left untreated, but there are possibilities to paint the spray in the future if the owner of the building desires to do so.





### Mixing

**Wet mix sprays:** Make sure that the mixing time is exactly 3 minutes. If the products are not mixed for 3 minutes it can result in reduction of the fire protection, or cause excessive material usage.

**Dry mix sprays:** Cut the bag and put the content in the mixer. No further actions is required at this point.



### Quality control

**Wet mix sprays:** Test the density of the product by weighing the product at the mixer, and at the spray nozzle after being sprayed in a bucket. Also test the slump of the mix. The density and slump must be as described in the application manuals.

**Dry mix sprays:** Make sure the amount of water mixed with the product at the nozzle, is correct. Too much or too little can inflict the correct level of fire protection or cause excessive



### Reinforcement

**Wet mix sprays:** Reinforcement can be used on beams or slabs if found necessary. In cases where excessive strength is needed, reinforcing mesh can be applied.

**Dry mix sprays:** Reinforcement can be used on beams or slabs if found necessary. In cases where excessive strength is needed, reinforcing mesh can be applied.



### Spraying

Spray the substrate as described under Application on page 9 and 14. Keep a smooth and steady motion across the substrate, to make sure the layers are even in thickness.

Avoid clusters of product in one spot, and remember to focus on the inside of the bottom flange on steel profiles.



### Finish

**Wet mix sprays:** Wet mix products can be smoothed to obtain an esthetic surface. Use boards mounted to the steel to obtain the best result. PROMASPRAY® C450 can be treated with Promat TOPCOAT 200 if exposed to repetitive washing.

**Dry mix sprays:** Dry mix products can also be smoothed to obtain an esthetic surface.



Promat Nordic, a part of the Etex Group, is a leading manufacturer of fire protective products and systems. Promat offers an extensive range of products designed to meet the highest requirements of the 21st century building legislation.

We strive to use our worldwide knowledge and experience to give our local partners the Best Insulating Performance solution to their fire protective needs.

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