

SEALING & BONDING  
SIKA FIRE PROTECTION  
SOLUTIONS FOR JOINTS AND  
PENETRATIONS

BUILDING TRUST





## BENEFITS OF OUR SOLUTIONS

Sika provides comprehensive solutions where fire resistant construction is required such as tunnels, commercial and residential buildings and steel structures. Fire resistant mortars, intumescent coatings and specially designed sealants enable the building of safer buildings and infrastructure. Our fire rated sealants and foams comply with the latest relevant standards and can be used for inside and outside applications on various substrates.

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# SIKA SOLUTIONS FULFILL THE HIGHEST STANDARDS

## SIKA SOLUTIONS HELP TO SAVE LIVES

In case of fire within buildings smoke and heat will spread through penetrations and joints endangering residents and blocking escape paths.

Fire protection solutions from Sika seal penetrations and joints and help retain fire and smoke to where they occur for a certain time, allowing inhabitants to exit the building safely. Sika fire rated products and systems comply with the most relevant standards (EN, ETAG, UL, ASTM) in order to ensure the highest fire resistance.

It is important to distinguish two different types of fire testing for building materials:

- **Reaction to fire:** How does the product react to an open flame? The reaction to fire is described by the combustibility, smoke development and dripping behaviour.
- **Fire Resistance:** How long can a product that is built into a fire protection system withstand the impact of fire. This is described by the resistance time during standardized fire tests.

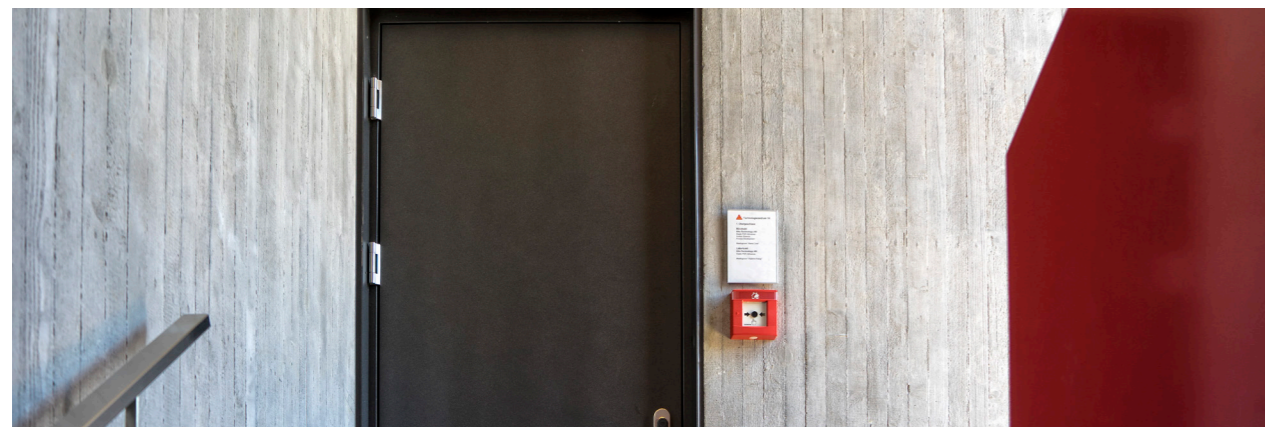
For the fire resistance of a building only the combined resistance of the system's individual components counts. For example a fire resistant door together with the fire resistant sealant and wall can hinder the spreading of fire and smoke. Therefore fire resistant tests are much more important than the reaction of a product to a flame.

## REACTION OF BUILDING MATERIALS TO FIRE

The reaction of building materials to fire is determined by exposing the single product in its not installed state to fire and heat. For example EN 13501-1 classifies how easily materials can catch fire, how smoke develops and if dripping occurs. It does not, however, provide any information about how long the product resists fire in a system.

Building material class according to EN 13501-1*	Building inspection designation	Test standards
A1	non-combustible and not containing any combustible components	EN ISO 1182, EN ISO 1716, EN ISO 9239
A2	non-combustible but containing certain amounts of combustible components	EN ISO 1182, EN ISO 1716, EN ISO 9239
A2, B, C	Flame retardant	EN ISO 9239-1
D	Normally flammable	EN ISO 9239-1
E	Normally flammable	EN ISO 11925-1
F	Easily flammable	No test required

\* For additional sub-classes for smoke development and occurrence of dripping see EN 13501-1



## RESISTANCE TO FIRE OF INSTALLED BUILDING MATERIALS

There are many fire resistance testing standards for building materials or building elements. The most relevant for joint sealants and penetration seals are:

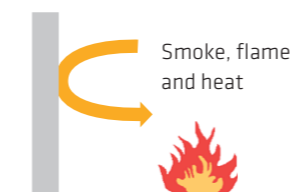
- AS 1530: Methods for tests on building materials, components, structures, Part 4: Fire-resistance tests of elements of construction. Part 10: Service penetrations and control joints.
- EN 1366: Fire resistance tests for service installations - Part 3: Penetration seals, Part 4: Linear joint seals
- ETAG 026: Fire stopping and fire sealing products - Part 3: Linear joint and gap seals
- UL 2079: Tests for fire resistance of building joint systems
- ASTM E119: Fire tests of building construction and materials
- BS 476-20: Fire resistance test for linear joints

These tests not only include the sealant but an entire section of the building where the sealant is installed with a backing rod into a joint formed by a relevant building material - concrete in most cases.

The tested Sika system consists of:

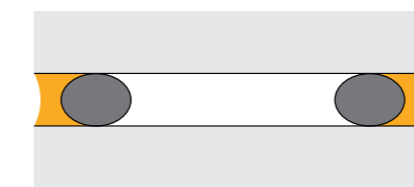
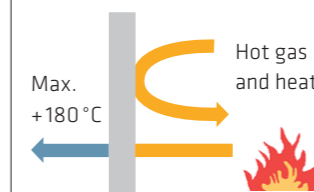
### Integrity Function

Integrity is the capability of a building element, when exposed to fire on one side, to prevent the passage of flames, smoke and hot gases to the unexposed side. There is no temperature limit on the non-fire side.

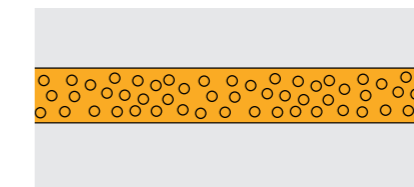


### Insulating Function

Thermal insulation is the capability of a building element to maintain its required thermal insulation separating function in case of fire (with a max. 180° temperature rise on the non-fire side).



Fire rated sealant (yellow) combined with a standard PE backing rod.



Fire retardant foam (yellow).

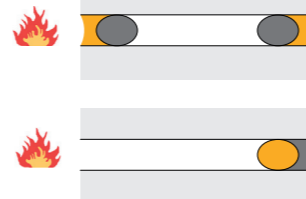
# JOINT INFORMATION

Information needed to choose the best fire rated joint sealing solution



## INFORMATION NEEDED:

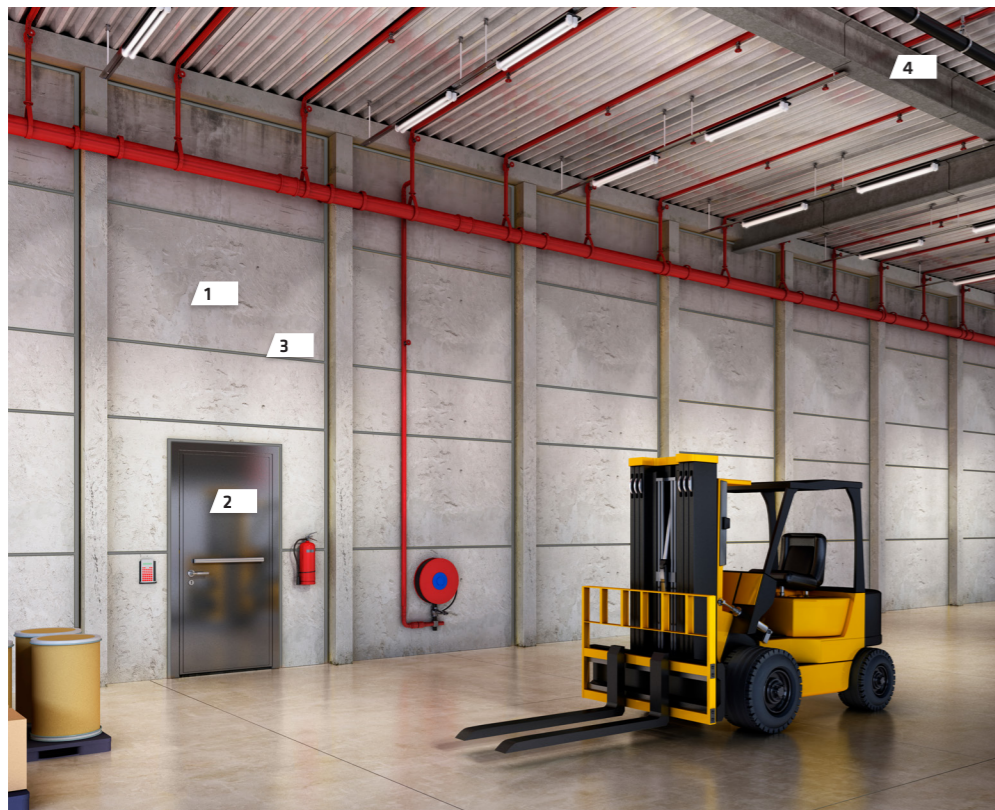
1. Substrates e.g. Concrete/Steel
2. Wall joint or floor joint
3. Wall thickness
4. Joint width
5. Single or double sided applied fire rated sealant



Many parameters have an influence on the fire resistance of a sealant in the applied and cured state in a joint. Therefore it is crucial to know the details of the joint.

Without the joint details the fire protection information *Integrity* and *Insulation* cannot be derived from the classification charts and the correct product chosen.

## EXAMPLE OF FIRE RATED SEALANT APPLICATION



- 1 Precast concrete elements
- 2 Fire protection door
- 3 Sika fire protection sealant: Sikaflex®-400 Fire
- 4 Sika fire protection coating: Sika® Unitherm Platinum

In the image above a possible application of fire rated sealants and protective coatings is illustrated. A big distribution centre and warehouse is divided into several sections. To avoid the spread of fire and smoke between the sections several fire protection measures are taken. The walls

are made of precast concrete elements that are sealed to each other with Sikaflex®-400 Fire. This combination unifies efficient installation, best sealing properties and highest fire protection. Choose Sika fire protection solutions for best performance.

# SIKA FIRE RATED PRODUCTS

## Sikaflex®-400 Fire

1-part, fire rated moisture curing elastic joint sealant



### Use

Sikaflex®-400 Fire is designed for fire rated movement and connection joints on porous and non-porous substrates. It is suitable for interior and exterior applications.

### Key Advantages & Benefits

- Up to 4 hours fire resistance according to AS 1530.4
- Up to 4 hours fire resistance according to EN 1366-4
- Movement capability of  $\pm 35\%$  (ASTM C719)
- Easy to smooth and very good workability
- Good adhesion to many different substrates
- Long open time

### Approvals/Standards

- AS1530.4 FRL
- EN 1366-4
- ASTM C920 class 25
- ISO 11600 class 25 LM
- EN 15651-1 F EXT-INT CC

## Sika® Firerate

1-part, intumescent fire rated acrylic sealant



### Use

Sika Firerate is ideal for use as an interior sealant when fire rated joints are required between concrete or masonry building components.

### Key Advantages & Benefits

- Safe to use - water based, contains no asbestos or fibres
- Good adhesion to concrete and masonry substrates
- One component, ready to use
- Overpaintable when tack free
- Cost effective - minimal waste

### Approvals/Standards

- AS 1530 Part 4

## Sika Boom®-FR

1-part, high yield, fire rated polyurethane foam which can be applied by application gun



### Use

Sika Boom® FR is designed for linear joints in brickwork and concrete where fire protection is required.

### Key Advantages & Benefits


- High yield
- Easy application with application gun
- Very good temperature insulation
- Effective sound dampening
- HFC-free

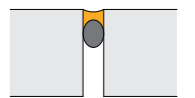
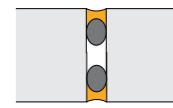
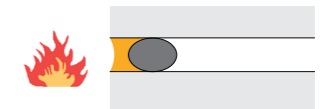
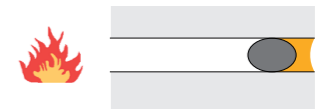
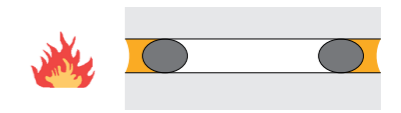
### Approvals/Standards

- DIN 4102: B1 fire rating class
- BS 476 Part 20: fire rated up to 5 hours fire protection

# FIRE RESISTANCE OF JOINTS WITH Sikaflex®-400 Fire

## FIRE RESISTANCE OF Sikaflex®-400 Fire TESTED ACCORDING TO AS 1530 Part 4

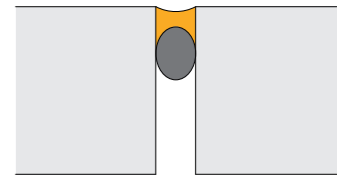
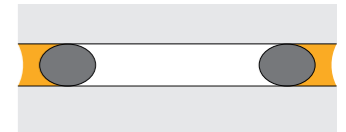
Sikaflex®-400 Fire	Substrates	Element type	Minimum element thickness	Joint width	Width/depth ratio	Fire resistance rating to AS 1530 Part 4	Kind of sealing
	Concrete/Concrete	Wall	150 mm	20 mm	2:1	-/240/180	Double seal
	Autoclaved aerated concrete / Autoclaved aerated concrete	Wall	150 mm	12 mm	2:1	-/240/240	Double seal
	Autoclaved aerated concrete / Autoclaved aerated concrete	Wall	150 mm	40 mm	2:1	-/180/120	Double seal
	Concrete/Concrete	Wall	150 mm	20 mm	2:1	-/240/120	Single seal on non-fire side
	Autoclaved aerated concrete / Autoclaved aerated concrete	Wall	150 mm	12 mm	2:1	-/240/120	Single seal on non-fire side
	Autoclaved aerated concrete / Autoclaved aerated concrete	Wall	150 mm	40 mm	2:1	-/120/120	Single seal on non-fire side
	Concrete/Concrete	Wall	150 mm	20-30 mm	2:1	-/240/-	Single seal on fire side
	Autoclaved aerated concrete / Autoclaved aerated concrete	Floor	150 mm	12-40 mm	2:1	-/240/240	Double seal
	Autoclaved aerated concrete / Autoclaved aerated concrete	Floor	150 mm	12 mm	2:1	-/180/120	Single seal on non-fire side
	Autoclaved aerated concrete / Autoclaved aerated concrete	Floor	150 mm	40 mm	2:1	-/120/120	Single seal on non-fire side



# FIRE RESISTANCE OF JOINTS WITH Sika® Firerate

FIRE RESISTANCE OF Sika® Firerate, TESTED ACCORDING TO AS 1530.4-1997 SECTIONS 2, 4 & 10 AND AS 4072.1-1992

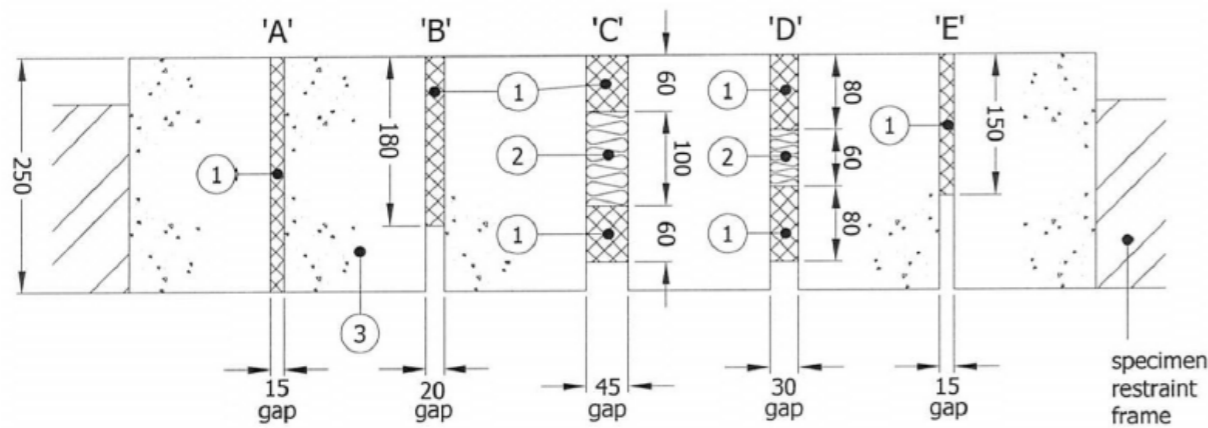
Sika® Firerate	Substrates	Element type	Minimum element thickness	Joint width	Width/depth ratio	Resistance class according to EN 13501-2	Kind of sealing
	Concrete or masonry walls (FRL 120/120/120 or -/120/120)	Wall	120 mm	10 mm	1:1	-/120/120	Single seal on fire side or double seal
		Wall	120 mm	20 mm	2:1	-/120/120	Single seal on fire side or double seal
		Wall	120 mm	30 mm	2:1	-/120/120	Single seal on fire side or double seal
		Wall	120 mm	40 mm	2:1	-/120/120	Single seal on fire side or double seal
		Wall	120 mm	50 mm	2.5:1	-/120/120	Single seal on fire side or double seal
	Concrete or masonry walls (FRL 180/180/180 or -/180/180)	Wall	150 mm	10 mm	1:1	-/180/180	Single seal on fire side or double seal
		Wall	150 mm	20 mm	2:1	-/180/180	Single seal on fire side or double seal
		Wall	150 mm	30 mm	2:1	-/180/180	Single seal on fire side or double seal
		Wall	150 mm	40 mm	2:1	-/180/180	Single seal on fire side or double seal
		Wall	150 mm	50 mm	2.5:1	-/180/180	Single seal on fire side or double seal
	Concrete or masonry walls (FRL 240/240/240 or -/240/240)	Wall	170 mm	20 mm	2:1	-/240/240	Single seal on fire side or double seal
		Wall	170 mm	30 mm	2:1	-/240/240	Single seal on fire side or double seal
		Wall	170 mm	40 mm	2:1	-/240/240	Single seal on fire side or double seal
		Wall	170 mm	50 mm	2.5:1	-/240/240	Single seal on fire side or double seal
	Solid normal weight/light-weight concrete floors (FRL 120/120/120)	Floor	120 mm	20 mm	2:1	-/120/120	Single seal on fire side or double seal
		Floor	120 mm	30 mm	1.5:1	-/120/120	Single seal on fire side or double seal
		Floor	120 mm	40 mm	2:1	-/120/120	Single seal on fire side or double seal
		Floor	120 mm	50 mm	2.5:1	-/120/120	Single seal on fire side or double seal
	Solid normal weight/light-weight concrete floors (FRL 180/180/180)	Floor	150 mm	20 mm	2:1	-/180/180	Single seal on fire side or double seal
		Floor	150 mm	30 mm	1.5:1	-/180/180	Single seal on fire side or double seal
		Floor	150 mm	40 mm	2:1	-/180/180	Single seal on fire side or double seal
		Floor	150 mm	50 mm	2.5:1	-/180/180	Single seal on fire side or double seal
	Solid normal weight/light-weight concrete floors (FRL 240/240/240)	Floor	170 mm	20 mm	2:1	-/240/240	Single seal on fire side or double seal
		Floor	170 mm	30 mm	1.5:1	-/240/240	Single seal on fire side or double seal
		Floor	170 mm	40 mm	2:1	-/240/240	Single seal on fire side or double seal
		Floor	170 mm	50 mm	2.5:1	-/240/240	Single seal on fire side or double seal



# FIRE RESISTANCE OF JOINTS WITH Sika® Boom-FR

FIRE RESISTANCE OF Sika Boom®-FR, TESTED ACCORDING TO BS 476:20 1987 & ASSESSED IN COMPLIANCE WITH AS 1530.4 - 2005

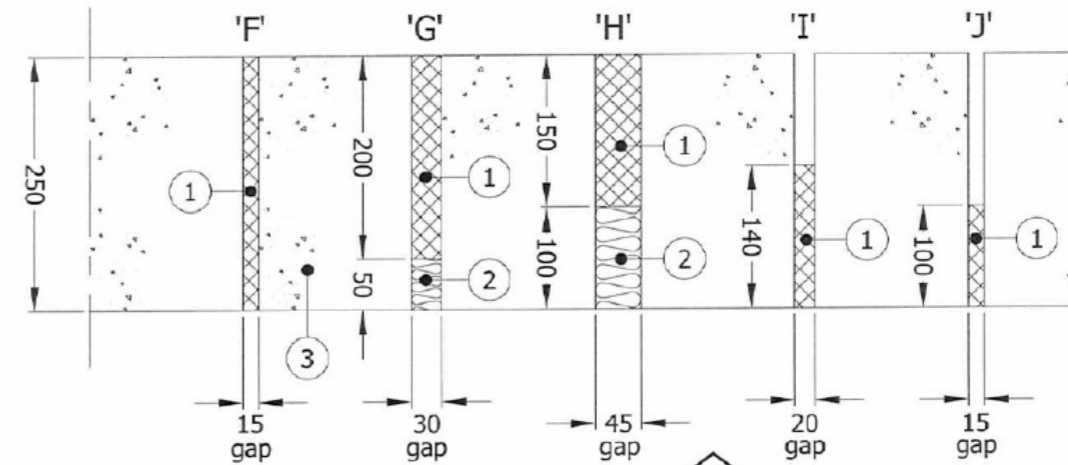
Sika Boom®-FR	Substrates	Element type	Minimum element thickness	Joint width	Joint depth	Resistance class according to BS 476:20 1987/ AS 1530.4 2005	Kind of sealing
Autoclaved Aerated Concrete Walls 670 kg/m <sup>3</sup>		Wall A	250 mm	15 mm	250 mm	-/240/240	Double seal (no backing material)
		Wall B	250 mm	20 mm	180 mm	-/180/180	Single seal on fire side (no backing material)
		Wall C	250 mm	45 mm	60 mm	-/240/240	Double seal (with backing material)
		Wall D	250 mm	30 mm	80 mm	-/240/240	Double seal (with backing material)
		Wall E	250 mm	15 mm	150 mm	-/120/120	Single seal on fire side (no backing material)
Autoclaved Aerated Concrete Floors 670 kg/m <sup>3</sup>		Floor F	250 mm	15 mm	250 mm	-/240/240	Double seal (no backing material)
		Floor G	250 mm	30 mm	200 mm	-/240/240	Single seal non-fire side (with backing material)
		Floor H	250 mm	45 mm	150 mm	-/240/240	Single seal non-fire side (with backing material)
		Floor I	250 mm	20 mm	140 mm	-/60/60	Single seal on fire side (no backing material)
		Floor J	250 mm	15 mm	100 mm	-/30/30	Single seal on fire side (no backing material)



Section through wall specimen

**KEY**

1. Sika Boom-FR
2. Backing material - Rockwool RPB-12 Mineral rock fibre (110 kg/m<sup>3</sup>)
3. Autoclaved aerated concrete wall/floor (670 kg/m<sup>3</sup>)



Section through floor specimen

# FIRE PROTECTIVE COATINGS FOR LOAD BEARING STRUCTURES

Sika® Unitherm Platinum: intumescent and fire resistant

Sika® Unitherm® and Sika® Pyroplast® are fire protection coatings that are applied on building materials like steel, wood, concrete and cables. Under the impact of heat the surface of the coating softens and the coating swells to form a foam. The originally millimetre-thin coating converts into a centimetre-thick, micro-porous foam that insulates the substrate against heat.

For a safe evacuation of the building in case of fire, fire protection regulations require that the structural construction elements of a building are effectively protected from losing their load-bearing stability for a certain time.



## STEEL

Steel structures do not burn but can lose their load bearing capability and static stability under the impact of fire and heat within a few minutes. The activated fire protection coating delays when the steel structure reaches the critical temperature of 500° C.

- Sika has several products for steel protection coatings in various colours.
- Sika® Unitherm® Platinum: Two component epoxy coating for exterior and interior steel structures



## WOOD

Wood is a natural building material with a multitude of uses in construction. However, wood is flammable and especially when used in public buildings needs to be protected for the case of fire. Sika® Pyroplast® inhibits or delays inflammation of the wood surface and hinders the spreading of fire by limiting the access to oxygen. Sika fire protection coatings combine highest protection with aesthetic advantages and do not affect the natural beauty of the wood.

## Sika® Unitherm Platinum

Sika® Unitherm Platinum revolutionized the fire protection market as it brings enormous advantages for the whole planning and realisation of a project. Sika® Unitherm Platinum is a solvent-free, epoxy resin based fire protection coating (R 30 – R 120) for steel for interior and exterior areas. The two component coating is applied on the steel structural elements in the workshop and the parts can be transported and installed after only 24 hours. The coating is highly resistant to mechanical impact and atmospheric conditions simplifying and accelerating the construction process compared to traditional products that have to be applied on site due to their sensitivity.

### Advantages

- Independent fire testing according to EN 13381-8 & CF-Certification
- Classified according to ETAG 018-2: 2006 Type X & ISO 12944 C5M/I
- Fire protection performance: Classification B-s2, d0 (EN 13501-1)
- 100% total solid content. Wet film thickness = dry film thickness
- In-shop application under controlled climatic conditions
- Short application and drying times. Ready for transport and handling only after 24 hours
- Can be applied with or without a primer
- No top coat needed
- Excellent corrosion protection
- High mechanical impact, shock and abrasion-resistant, minimizing transportation damages
- Resistant against any atmospheric conditions
- Simplifies and accelerates construction process and reduces project costs
- Cleaning of the coated surface is possible with high-pressure water jet



# FIRE PROTECTION MORTAR FOR TUNNELS

Sikacrete®-213 F: Sprayed fire protection mortar for concrete

In the case of fire in a tunnel, the concrete can be exposed to extreme temperatures within a very short time. This heat causes high vapour pressure within the concrete that fractures and destroys it from the inside. Sikacrete®-213 F is a spray-applied mortar providing an insulating layer, which protects the load-bearing structural concrete from high temperatures.

This pre-batched mortar is classed as a passive fire protection system and is applied by the wet-spray process. Sikacrete®-213 F is a fire protection mortar with exceptional heat insulation properties, applied in thin layers to provide reliable fire protection for concrete structures. The material is straightforward and easy to apply, with effective insulation being achieved with relatively low quantities and thickness of the material.

Sikacrete®-213 F is a fire protection mortar with high compressive strength and durability. This mortar is also designed to be frost resistant and is used in tunnels with high exposure stresses – such as lower temperatures, damp environments and abrasion from frequent cleaning.

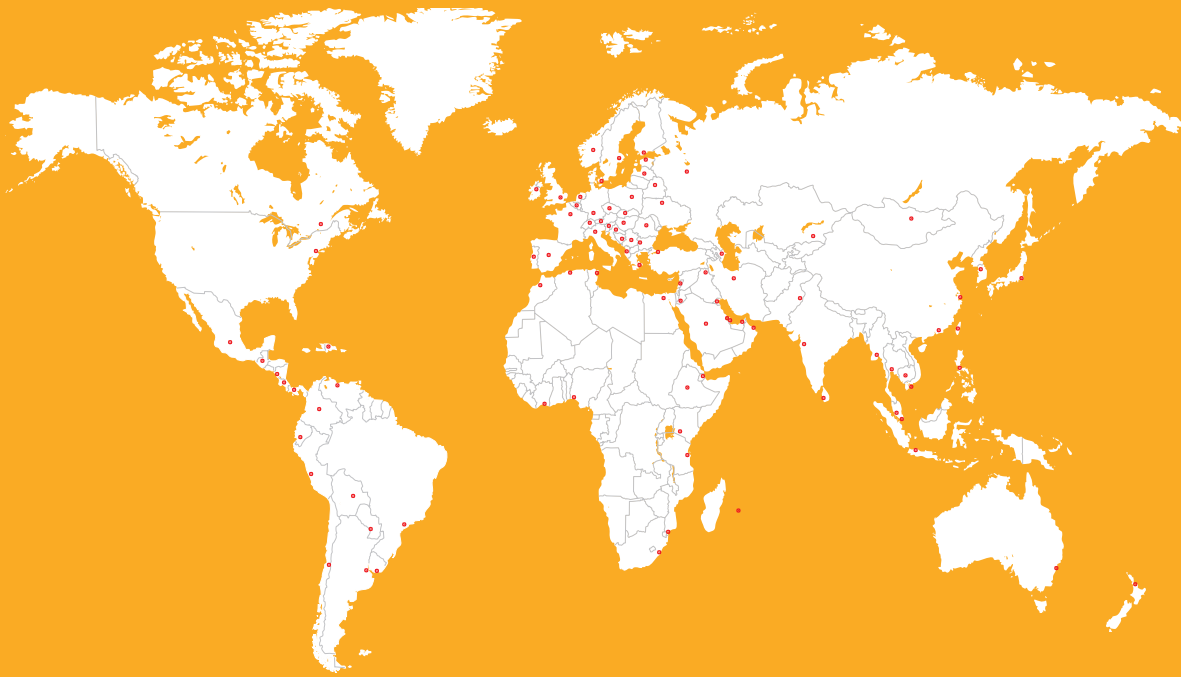


### Advantages

- Thin-layer system
- High insulation
- Ready-to-use mortar
- Easy and fast application
- Low material consumption
- Tested according to RWS, ISO 834 and HCinc
- High durability
- Coatable with Sikagard-Wallcoat



# GLOBAL BUT LOCAL PARTNERSHIP



## FOR MORE FIRE-RATED SEALING & BONDING INFORMATION:



### WE ARE SIKA

Sika is a specialty chemicals company with a leading position in the development and production of systems and products for bonding, sealing, damping, reinforcing and protecting in the building sector and the motor vehicle industry. Sika's product lines feature concrete admixtures, mortars, sealants and adhesives, structural strengthening systems, flooring as well as roofing and waterproofing systems.

Our most current General Sales Conditions shall apply.  
Please consult the Data Sheet prior to any use and processing.



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