

# OPTIMIZE & REVITALIZE

## TUNNEL CONSTRUCTION AND REFURBISHMENT

See how tunnel experts worldwide are tackling their biggest challenges and stay current with the latest innovative tunnel design and repair solutions.



### TUNNEL SAFETY EXCELLENCE

Cutting-edge safety solutions used on real-world projects

### ENHANCING CUSTOMER VALUES REDUCING ENVIRONMENTAL IMPACTS

Discover design essentials for resilient and sustainable tunnel repair solutions

## SIKA AROUND THE WORLD

Delve into our most remarkable projects worldwide and uncover the project challenges that were overcome with pioneering approaches

### TACKLING TUNNEL FIRES

Leveraging innovative technologies to optimize project costs and enhance safety

### PUSHING BOUNDARIES

Explore the latest technologies that are transforming the future of tunneling



# SHAPING THE FUTURE OF UNDERGROUND INFRASTRUCTURE TOGETHER



Welcome to our tunnel magazine.

In the following pages, we demonstrate how Sika delivers a comprehensive portfolio of materials for the construction, protection, and restoration of tunnels. Our solutions combine exceptional performance, safety, and durability with user-friendly characteristics to ensure the seamless execution of the works and the maximum service life of these critical pieces of infrastructure.

In addition to showcasing interesting projects from around the globe that incorporate our diverse solutions, we have included technical articles that draw from our extensive experience, gathered over more than a century in the tunneling industry.

We have curated a collection of insights from industry experts and international best practices to fill this magazine with inspiring projects and practical information that will enable you to address the complex challenges faced in today's tunnels and auxiliary infrastructures.

If you are already familiar with Sika as a leading manufacturer of high-quality engineered and technical mortars designed to meet the most stringent specifications for infrastructure projects, this magazine will further acquaint you with our tunneling portfolio. Moreover, it will enhance your understanding of the construction, protection, and repair options Sika offers – a comprehensive array of integrated solutions to meet diverse project requirements – while emphasizing our commitment to delivering high-value, sustainable solutions.

Thank you for joining us on this journey, and we look forward to being a trusted partner in your future tunneling endeavors.

Bernard Van Sever  
Head of Corporate Target Market Refurbishment  
Sika Services AG



Dworzec Główny  
15:00

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#### IMPRINT

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# SIKA AROUND THE WORLD

Throughout history, tunnels have always been important, valuable structures in their own right. They facilitate faster and more convenient transportation and communication for people, livestock, and goods, in addition to serving as waterways in many urban areas. Thus, by their very nature, tunnels are often built in areas where the topography, ground conditions, or other existing structures and developments make conventional pathways, roads, or railway construction impractical.

Tunnels play a vital role in a country's development. Even though they are mostly hidden from view, they are indispensable in urban transportation, water management, and other sectors such as hydropower. These underground structures are built in some of the most challenging conditions, taking into account the behavioral nature of the ground, the existing soil conditions, ground gases, and even underground water flows.

Sika has extensive experience in the construction and refurbishment of all types of tunnels. We have supplied solutions for some of the largest and most technically complex tunneling projects – from the Chuquicamata block caving mine below the Atacama Desert in Chile to the Gotthard Base Tunnel 2,500 meters below the Swiss Alps. With a comprehensive product range of renowned, thoroughly proven, and innovative systems, we can provide the appropriate solution for all your tunnel projects.

In this section, we showcase a selection of impressive global references where Sika's tunneling solutions have been successfully implemented.



SIKA@WORK

# PANAGOPOULA TUNNEL, GREECE



## PROJECT DESCRIPTION

Project name: Fire protection of existing Panagopoula Tunnel

Location: Peloponissos, Greece

Total length: Twin tunnels each 4 km long

Construction year: Under construction

## PROJECT REQUIREMENTS

The Panagopoula Tunnel is a 4 km long twin tunnel in need of rehabilitation due to a change in fire regulations. The Greek Railways Organization (OSE) and their subsidiary ERGOSE wanted to improve the passive fire protection of the tunnels so that it exceeded the evacuation time plus 10 percent.

Furthermore, they specified an RWS tested product should be used, as the Dutch fire rating curve by RWS is one of the most stringent. Furthermore, the proposed thickness of the application needed to be approved via on-site testing. The passive fire protection application size was around 200,000 m<sup>2</sup>.

## SIKA SOLUTIONS

Sika supplied a passive fire-protecting mortar system, which provided concrete protection whilst also increasing fire safety

and durability. Sikacrete<sup>®</sup>-213 F was chosen for its low layer thickness, high fire protection, and its ability to be applied to any substrate geometry. Furthermore, it would not contribute to the formation of smoke or toxic fumes during a fire.

First, Sika MonoTop<sup>®</sup>-910 Eco was applied for additional corrosion protection for the steel reinforcement. This was followed by applying Sikacrete<sup>®</sup>-213 F fire-protecting mortar, which would protect the concrete of the tunnel from spalling or delaminating in the event of a fire. Both products were delivered and applied in less than four months.

## Sika products used:

- Sikacrete<sup>®</sup>-213 F (400 tons)
- Sika MonoTop<sup>®</sup>-910 Eco (60 tons)

## PROJECT PARTICIPANTS

Project owner: OSE/ERGOSE

Designer: ERGOSE

Contractor: AVAX-AKTOR joint venture

Sika organization: Sika Hellas

## NAGPUR-MUMBAI EXPRESSWAY TUNNEL, INDIA



### PROJECT DESCRIPTION

Project name:  
Nagpur-Mumbai Expressway tunnel concrete protection  
Location: Maharashtra, India  
Total length: 8 km  
Construction year: 2022 – 2023

### PROJECT REQUIREMENTS

The Nagpur-Mumbai Expressway is a six-lane wide, 701 km long access-controlled expressway in Maharashtra, connecting Mumbai with the third-largest city, Nagpur. The project features six tunnels, the concrete structures needed to be protected to last long. Due to safety reasons, the tunnel needs to be fire resistant.

### SIKA SOLUTIONS

Sika was awarded the concrete protection works for one tunnel of 8 km in length.

Sika provided a passive fire protecting mortar system and a concrete protection coating, which provided concrete protection while also enhancing the fire safety and durability of the structure. Due to the hot climate, Sika also provided a high-performance anchoring adhesive for anchoring threaded rods and reinforcing bars within the tunnel concrete to provide additional longevity.

#### Sika products used:

- Sikacrete®-213 F (1,250 tons)
- Sika MonoTop®-1010 (150 tons)
- Sikagard®-340 WTC (65 tons)
- Sika AnchorFix®-3030

### PROJECT PARTICIPANTS

Project owner: Maharashtra State Road Development Corporation (MSRDC)  
PMC: EPTISA  
Contractor: Afcons Infrastructure Limited  
Sika organization: Sika India Pvt. Ltd.

## BRANISKO TUNNEL, SLOVAKIA



### PROJECT DESCRIPTION

Project name: Refurbishment of emergency sidewalk joints in Branisko Tunnel  
Location: D1 motorway between Beharovce – Fričovce, Slovakia  
Total length: 24 km  
Construction year: 2017

### PROJECT REQUIREMENTS

As a part of the refurbishment of Branisko Tunnel, the longest motorway tunnel in Slovakia, the National Motorway Company sought a flexible and durable PU grout that would be quick to install and had sufficient chemical resistance for use in road and tunnel construction. Furthermore, they wanted to minimize any downtime during maintenance activities.

### SIKA SOLUTIONS

After carefully reviewing the owner requirements, Sika determined that the standard solutions that use Sikaflex® products would not be appropriate. Having recently had several successful tram grouting projects in Poland using Sika® Icosit® products for their proven transportation performance and high chemical resistance on site, Sika suggested this as a faster and more suitable solution.

The project was divided into two parts: the first involved the installation of 12 km of 20 x 20mm joint in April 2017, with the second part completed in October of the same year, covering another 12 km of 20 x 20mm joint. The application of Sika® Icosit® KC was conducted by hand mixing and pouring, although machine application is available

#### Sika Products used:

- Sika® Icosit® KC 340 /45, Sika® Icosit® KC 340/65

### PROJECT PARTICIPANTS

Project owner: National Motorway Company a.s  
Contractor: OAT spol.s r.o.  
Sika organization: Sika Slovakia

## DWORZEC GŁÓWNY TRAM TUNNEL, POLAND



### PROJECT DESCRIPTION

Project name: New tram tracks for tram tunnel at Dworzec Główny (Main Railway Station)  
Location: Krakow, Poland  
Total length: 1.4 km  
Construction year: 2008

### PROJECT REQUIREMENTS

The new Fast Tram Network in Krakow required the construction of a new 1.4 km underground tunnel under the city's main railway station, including 2,480 meters of modern tram tracks and 236 meters of ramps. High mechanical resistance and durability were required, as well as the precision alignment and electrical isolation of the tracks. Furthermore, the tracks required protection from vibration and noise. All of this had to be completed within a short construction window whilst ensuring low life-cycle costs.

### SIKA SOLUTIONS

The optimal pace of work was achieved through the implementation of a comprehensive rail fixing system by Sika. The use of Sika® Icosit® KC, a hand/machine application material for trackworks and prefabricated track slabs, resulted in a significant acceleration of the project timeline. Sika provided a full light mass Spring System, which included prefabricated track slabs with an embedded rail system, using the Sika® Icosit® KC 340/45 series. The slabs were installed on approximately 5,000 m<sup>2</sup> of vibroisolation Sylomer® mats, which provided protection against vibration and secondary noise. The high quality of the Sika® Icosit® KC system made it possible to meet all project requirements. These factors also helped reduce the impact of tram traffic on the environment.

### PROJECT PARTICIPANTS

Project owner: Kraków City  
Investor: Agencja Rozwoju Miasta Kraków  
Contractor: Budostal 5, ZUE  
Sika organization: Sika Poland

## A2 HIGHWAY TUNNEL EDGE RESTORATION, ITALY



### PROJECT DESCRIPTION

Project name: A2 Highway Tunnel, Monte Ceneri: Edge Restoration  
Location: Monte Ceneri, Italy  
Total length: 3.2 km  
Construction year: 2020

### PROJECT REQUIREMENTS

The project involved the partial refurbishment of the 3,200-meter long Monte Ceneri highway tunnel, with a focus on repairing the deteriorated and cracked edges along the entire length of the carriageway. The work was divided into two phases and required detailed and precise planning. Repairs also had to be carried out during the night while the tunnel remained open to traffic, requiring a flexible and fast solution.

### SIKA SOLUTIONS

The intervention involved hydro-demolition of the reinforcement, installation of new reinforcement, formwork, and restoration of the existing geometry with a cementitious mortar compliant with the requirements of EN 1504-3 (class R4) and EN 1504-6. The prefabricated borders were instead removed and entirely replaced for a length of about 2,600 meters with new ones glued to the support. For greater speed and execution flexibility, Sika proposed a fluid, one-component, self-leveling, low-dust mortar for the repair of the existing edges, and a two-component, rigid, thixotropic epoxy-based mortar for the prefabricated edge replacement.

### Sika Products used:

- SikaGrout®-314 N (150,000 kg)
- Sikadur®-31 CF Normal / Rapid (9,000 kg)
- Sika MonoTop®-412 N / Sika MonoTop®-412 Eco (10,000 kg)

### PROJECT PARTICIPANTS

Project owner: Federal Roads Office USTRA  
Design Engineer: Filippini & Partner Ingegneria SA, Biasca  
Contractor: Mancini & Marti SA, Castione / Ennio Ferrari SA, Lodrino  
Sika organization: Sika Schweiz AG

## A3 HIGHWAY TUNNELS REFURBISHMENT, SWITZERLAND



### PROJECT DESCRIPTION

Project name: Refurbishment of 5 Tunnels on A3 Highway Between Murg – Walenstadt  
 Location: Murg – Walenstadt, Switzerland  
 Total length: 3.2 km  
 Construction year: 2018 – 2021

### PROJECT REQUIREMENTS

As part of extensive repair measures on the A3 highway, Sika undertook refurbishment work on 5 tunnels. Work was limited to Monday-Friday, 8pm–5am, to reduce traffic disruption. Due to high chloride contamination, 2,500 m<sup>2</sup> of concrete in the tunnels had to be partially removed and the walls restored with sprayed-on R4 repair mortar – a significant challenge.

### SIKA SOLUTIONS

Sustainable and durable solutions were achieved through collaboration and a wide range of Sika products. The R4 repair mortar Sika MonoTop®-422 PCC in 1000 kg BigBags was applied using the inoComb Cabrio 0.2 pump for efficient, dust-free application. Sikadur®-188 was used to create an additional chloride barrier at 0.5 meters above the tunnel base, while Sikadur®-331 W coated the restored areas. Sikagard® WallCoat AT was used for the prepared old coating and partially restored areas, and Sikagard®-705 L protected the less-loaded tunnel vault from moisture. For the Murgwald Tunnel, SikaCem® Pyrocoat was chosen as it met fire protection requirements.

#### Sika products used:

- Sika MonoTop®-422 PCC
- Sikadur®-188/-331 W
- Sikagard® WallCoat AT, Sikagard®-705 L
- SikaCem® Pyrocoat

### PROJECT PARTICIPANTS

Project owner: Federal Roads Office ASTRA Infrastructure  
 Design engineer: Basler & Hofmann AG Engineers, Planners, and Consultants  
 Contractor: ARGE MaHa Marti AG  
 Surface protection system contractor: Trauffer AG Building Protection  
 Sika organization: Sika Schweiz AG

## ADLER TUNNEL, SWITZERLAND



### PROJECT DESCRIPTION

Project name: Refurbishment of Adler Tunnel  
 Location: Basel, Switzerland  
 Total length: 40m  
 Construction year: year 1995 – 2000

### PROJECT REQUIREMENTS

Ten years after the completion of the Adler tunnel, cracks in the tunnel appeared, and the tunnel floor had swelled by up to 7 cm. To solve the problem, concrete bars were installed over the repair section and clamped to the mountain with rock anchors. However, a passive fire protection system was needed to protect reinforced concrete bars and rock anchor heads. The system had to comply with the ISO 834 fire curve for 60 minutes, with maximum temperatures of 200°C and 120°C for the abutment body and anchor heads, respectively. Anchor head niches had to be easily accessible for monitoring and tensioning. The fire protection layer was limited to a maximum of 3 cm due to clearance constraints and must withstand tensions of 4.0 kN/m<sup>2</sup> from train traffic. Finally, a single railway track needed to stay open during the works.

### SIKA SOLUTIONS

A 30 mm layer of Sikacrete®-213F was used for fire protection of the renovated section. The concrete was roughened with high-pressure water to ensure optimal adhesion with the substrate. Wire mesh was applied to increase the durability of the fire protection system. Furthermore, removable fire protection plates were used in the anchor head areas for easy monitoring and tensioning. The fire protection mortar was applied in stages while the railway traffic was single-track, in order to minimize disruption.

#### Sika products used:

- Sikacrete®-213F – 750 m<sup>2</sup>

### PROJECT PARTICIPANTS

Project owner: Swiss Federal Railways (SBB)  
 Design Engineer: Basler & Hofmann  
 Contractor:  
 Marti Bauunternehmungen AG and  
 Viktor Wyss AG  
 Sika organization: Sika Schweiz AG



[Reference page](#)



# NEW DEVELOPMENTS IN TUNNEL FIRE PROTECTION

A new research study reveals how vermiculite-based fire protection mortar can significantly enhance the fire resistance of reinforced concrete tunnels.

Tunnels rely heavily on concrete and mortar for structural support during various stages of construction: from pre-excavation ground treatment for terrain stabilization to shotcrete as primary and secondary lining. However, the mechanical properties of reinforced concrete elements tend to be damaged and weakened after they have been exposed to a significant fire. This leads to a thinner alkaline protective coating around steel reinforcement, as well as a reduction in the yield and stiffness of the steel. Tunnel fires can also rapidly increase concrete temperature, causing high vapor pressures and explosive spalling that can weaken the structure and pose a risk to human safety.

Different materials and technologies are used to provide passive fire protection solutions. In particular, sprayed fire-resistant mortars are notable for their ease of application, high performance, and ability to be applied to almost any substrate geometry. Therefore, when comparing fire protection solutions, mortars tend to be a much easier and more cost-effective solution.

A study was carried out to evaluate the performance of a vermiculite-based fire protection mortar in reinforced concrete tunnels. The mortar was not only tested in a laboratory, but also in a full-scale field test. The results were promising, with passive fire protection under the RWS fire curve successfully completed and passed, without any sign of cracking or spalling. This research will contribute to defining and evaluating the parameters in scaling this performance under real field conditions, and its influence as a realistic intervention scenario during tunnel service operations.

Have a look at the complete study to learn more about lightweight fireproofing mortars.



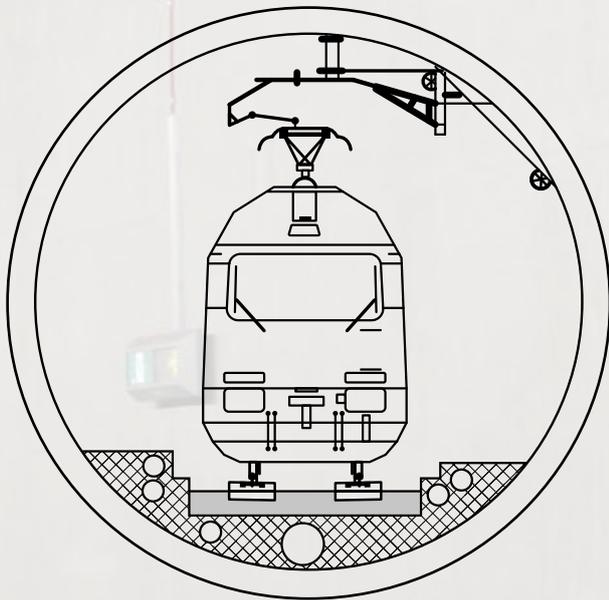
Vermiculite-based Fire Protection Mortar in Reinforced Concrete Tunnels - [Link](#)



# REVOLUTIONIZING TUNNEL SAFETY: THE ADVANTAGES OF EMBEDDED RAIL SYSTEMS

Are traditional ballasted tracks still safe enough? Find out why embedded rail systems are outshining and outperforming.

When comparing different kind of track surfaces used in tunnels – ballasted (with sleepers) and ballastless (using blocks) with an embedded rail system – it's clear there are some unique advantages of embedded rails.

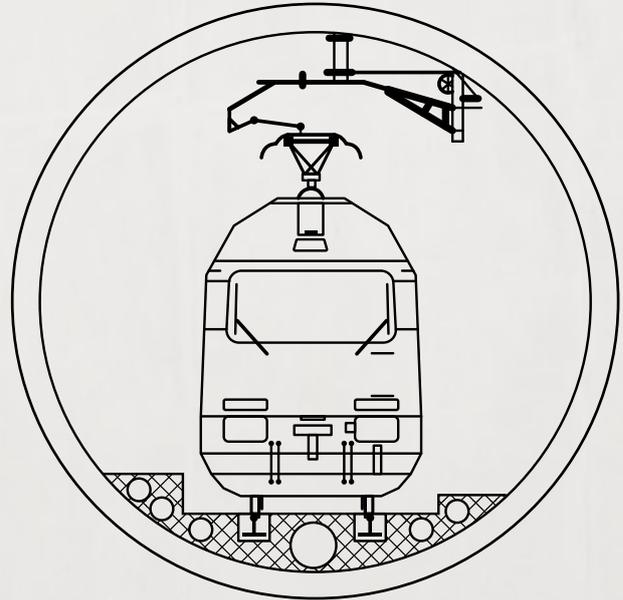


Example: Standard Rail System (SRS).

These include the secondary noise and vibration attenuation and excellent electrical insulation, which reduces the phenomenon of stray currents. The running surface is also easier to clean and better for pedestrian evacuation and emergency vehicle access because it is flat. In case of an emergency within the tunnel requiring an evacuation of all passengers from the train, people are safer because the driving surface is unobstructed. There are no hurdles within the gangway where people will walk to the next emergency exit. The improved access for emergency vehicles can also save essential time for all rescue teams.

In terms of fire safety, when applied between non-flammable substrates (such as concrete and steel), the use of an embedded rail system with Sika® Icosit® KC 340 flexible PU grout does not present a fire risk nor a risk of smoke and fumes.

An important fact to note is that such a system installed on straight sections ensures very high durability; however,



Example: Embedded Rail System (ERS).

in the case of curves, the condition (corrugation) of the rail head is the limit. Importantly, the rail head, if used with the appropriate technology, can be rebuilt (up-welded) without destroying the rail fastening system. During such works, if the track is an embedded rail system using Sika® Icosit® KC 340 products, there is no need to introduce protections other than for welding works.

## **SUMMARY OF THE ADVANTAGES OF EMBEDDED RAIL SYSTEMS (ERS):**

- Even surface within the tunnel, thus no obstacles on the gangway for passengers and rescue services.
- Trafficable for emergency vehicles such as ambulances and firefighting trucks, etc.
- Does not present a fire risk nor a risk of smoke and fumes.
- Head rail can be rebuilt (up-welded) without destroying the rail fastening system.
- High durability with very low or almost zero maintenance.

# HOW TO EXTEND THE LIFESPAN OF YOUR TUNNEL

Can reinforced concrete deterioration be prevented? A new study delves into the effects of hydrophobics on reinforced concrete in road tunnels, providing insight that could change how we approach tunnel maintenance.

Concrete structures located near seawater or exposed to deicing salts on roads are prone to chloride exposure, which can lead to corrosion of the reinforcement and consequently, a loss of structural integrity. Over a prolonged service life, however, even components that are not directly exposed, such as concrete surfaces outside of the spray water area of a tunnel, can also be affected.

A long-term study over 12 years was performed to investigate the effect of a hydrophobic silane treatment on the moisture balance and durability of a suspended tunnel ceiling compared to an untreated surface with the same exposure. A monitoring system was installed in the concrete structure to measure the electrical resistivity of the concrete and the corrosion rate of the steel reinforcement over time.

The data collected was combined with tunnel climate measurements to gain new insights into the effect of the tunnel climate on the damage mechanism. The measurements have provided evidence regarding the long-term efficacy and proper application of hydrophobic silane treatment, which, in some areas, had completely prevented moisture penetration. This data also enables a more precise estimation of the tunnel ceiling's condition and deterioration process, which will facilitate the optimization of asset maintenance programs.



Have a look at the [complete scientific paper](#) to learn more about preventing corrosion problems in tunnels.



# Sika® Icosit® KC FLEXIBLE POLYURETHANE GROUTS FOR RAIL FIXING

As urban spaces continue to develop rapidly, town planners are increasingly seeking to expand local public transport and railway systems to cope with demand. The long-term durability, electrical resistance, and low maintenance of these systems are essential factors. Furthermore, there is a growing need for reduced vibration and noise in the rail fastening system, making flexible, volume-compressible grout materials an effective solution.

Sika provides technical support to consultants, operators, and contractors for every stage of railway installation projects. Sika's optimized and innovative rail track installation solutions can withstand a wide range of exposures and conditions for maximum axle loads of up to 25 tons.

### TYPES OF RAIL FIXING AND GROUT

Depending on the design, the rail track is supported by means of an elastic support point with discrete fixation, or a continuous rail base with embedded rails.



Discrete Fixation Rail Track.



Continuous, Embedded Rail Track.



### BENEFITS OF Sika® Icosit® KC GROUTS

- Resilient waterproof intermediate layer reduces noise and vibration transmission, providing “silent tracks”
- Extremely low maintenance costs and long service life for cost-effectiveness
- Load bearing and resistant to dynamic loads, providing permanent alignment and ensuring track stability
- Levels out tolerances between rail and substrate for smooth train operation
- Long-term resistance against water and most detergents for long service life in train wash stations
- Short-term resistance against oils, diesel, fuel, fat, and more for tracks integrated with road surfaces
- Versatile, suitable for any kind of rails and substrates
- Highly efficient electrical resistivity for prevention of stray current leakage to safeguard against signaling malfunction
- Can be manually or machine applied depending on site constraints, providing an economical solution



Visit [www.sika.com](http://www.sika.com) to learn more about the solutions available and the Sika® Icosit® KC range.

VALUE

# ENHANCING CUSTOMER VALUE

**AND REDUCING ENVIRONMENTAL IMPACTS** is one of our key pillars. Our goal is to provide the most innovative and effective solutions with reduced environmental impacts to fulfill a project's technical requirements and, at the same time, protect and respect our commitment to minimizing our environmental impact.

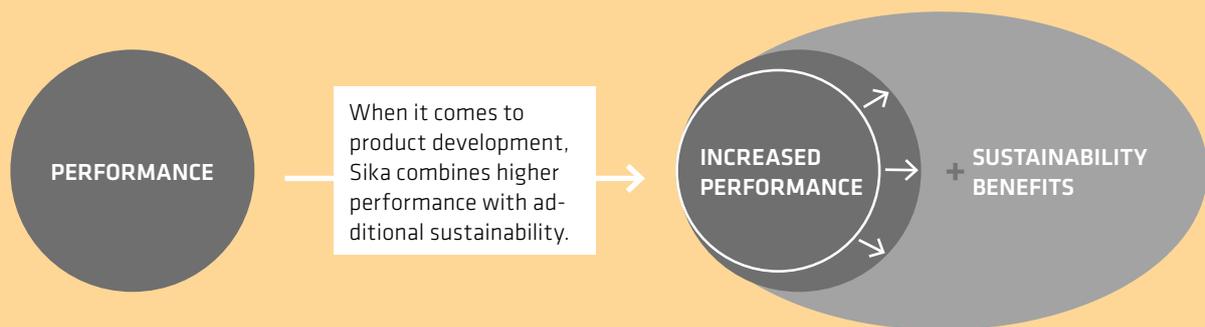
Aiming for this goal, Sika has been developing the Sustainability Portfolio Management (SPM) Methodology. It is the mechanism used by Sika in order to evaluate and classify its products in terms of both Performance and Sustainability.

The objective of Sika's SPM approach is to manage innovation and sustainability, minimizing the risks and maximizing the opportunities associated with our products.



The outcome of the SPM is a portfolio of “Sustainable Solutions” – products with combined significant Sustainability and Performance benefits.

### INNOVATION – STRONGER FOCUS ON PRODUCT SUSTAINABILITY



## SIKA HAS DEVELOPED A UNIQUE TECHNOLOGY THAT ALLOWS US TO OFFER INNOVATIVE AND DURABLE CONCRETE REPAIR MORTARS WITH A REDUCED CARBON FOOTPRINT

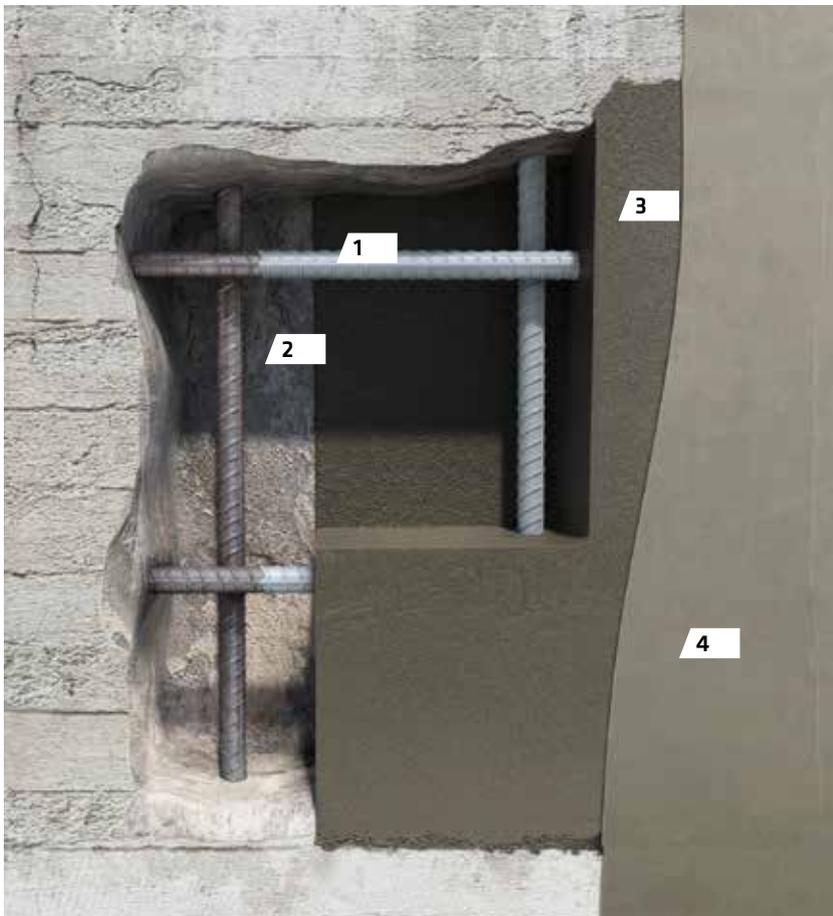
This new Sika MonoTop® concrete repair mortar range was developed after years of research and is formulated to achieve a long lasting service life in all the remedial works of damaged concrete due to corrosion, structural damages, water infiltration, freeze and thaw cycles, seismic activity, reactive aggregates, etc. The range forms a complete system that will

allow you to maximize the durability of your structure while minimizing the resources used.

The complete range has the following products:

- Sika MonoTop®-1010, bonding primer and reinforcement corrosion protection slurry
- Sika MonoTop®-4012, concrete repair mortar
- Sika MonoTop®-3020, pore sealer and levelling mortar

### Sika MonoTop® REDUCED CARBON FOOTPRINT CONCRETE REPAIR MORTAR SYSTEM



1

#### Reinforcement Corrosion Protection Sika MonoTop®-1010

- To prevent further corrosion of steel reinforcement

2

#### Bonding Primer Sika MonoTop®-1010

- To promote adhesion of the repair mortar on demanding substrates

3

#### Repair Mortar Sika MonoTop®-4012

- To repair concrete defects
- To restore structural integrity
- To improve durability
- To improve appearance
- To extend the structure's design life

4

#### Pore Sealer / Levelling Mortar Sika MonoTop®-3020

- To restore durability
- To restore aesthetic appearance
- To restore geometric appearance
- To provide a surface for over-coating



# Sikacrete®-213 F FIRE PROTECTION MORTAR

Modern regulatory standards for fire safety are becoming increasingly strict, particularly in tunnels. To meet this need, innovative passive fire protection solutions are being developed, including new fire protection mortars.

Sikacrete®-213 F is a cementitious fire protection mortar with highly effective phyllosilicate aggregates, which can be applied to tunnels using a wet spray application process. The thickness of the fire protection layer can be customized depending on the specific fire resistance required. This product is ideal for protecting concrete and reinforced concrete structures - particularly tunnel linings - as well as those reinforced with FRP, such as Sika® Carbodur® and SikaWrap®. Ensure the best fire resistance of your tunnel with this innovative fire protection mortar.



## BENEFITS OF Sikacrete®-213 F

- Low layer thickness thanks to high-performance vermiculite
- Can be applied to any given substrate geometry, including complex shapes and holes
- Does not contribute to the formation of smoke or toxic fumes in fire (tested with Sikagard®-340 WTC and classified as A2s1d0)
- Highly sustainable (Emicode EC1+, Leedv4.1 VOC Content)
- Breathable thanks to vermiculite morphology
- Increases both thermal and acoustic insulation
- Jointless system for less maintenance
- Easy to maintain and repair



Visit this [link](#) to learn more about the passive fire safety solutions available and the Sikacrete® range of products.



# BUILDING TRUST SINCE 1910

SIKA HAS PROVIDED WATERPROOFING SOLUTIONS FOR MORE THAN

**100 YEARS**

THE FIRST PRODUCT - Sika®-1 - IS STILL ON THE MARKET

EVERY YEAR SIKA SUPPLIES ENOUGH ROOF MEMBRANES TO COVER THE

**WHOLE OF  
MANHATTAN**

MORE THAN

**30%**

INTERIOR NOISE REDUCTION IN VEHICLES THANKS TO SIKA'S ACOUSTIC SOLUTIONS

USING SIKA'S LONG-LASTING WINDOW INSTALLATION SEALANTS, MORE THAN

**1 MILLION**

WINDOW FRAMES ARE SEALED EACH YEAR HELPING TO SAVE MORE THAN

**10,000**

TANKER LOADS OF HEATING OIL OVER THEIR COMPLETE LIFETIME

SIKA'S CLEANROOM FLOORING SYSTEMS RELEASE

**1,000 TIMES  
LESS EMISSIONS**

THAN STANDARD LOW VOC SYSTEMS

WITH

**84 AWARDS**

IN 16 YEARS, SIKA IS THE COMPANY WITH THE MOST CONCRETE REPAIR PROJECTS AWARDED WORLDWIDE

THANKS TO SIKA'S RANGE OF WATER REDUCERS OVER

**25,000 MILLION  
LITERS OF WATER**

ARE SAVED ANNUALLY IN CONCRETE PRODUCTION

IN OVER 80 COUNTRIES, MORE THAN

**10,000  
ROOFING CONTRACTORS**

ARE TRAINED AND CERTIFIED BY SIKA

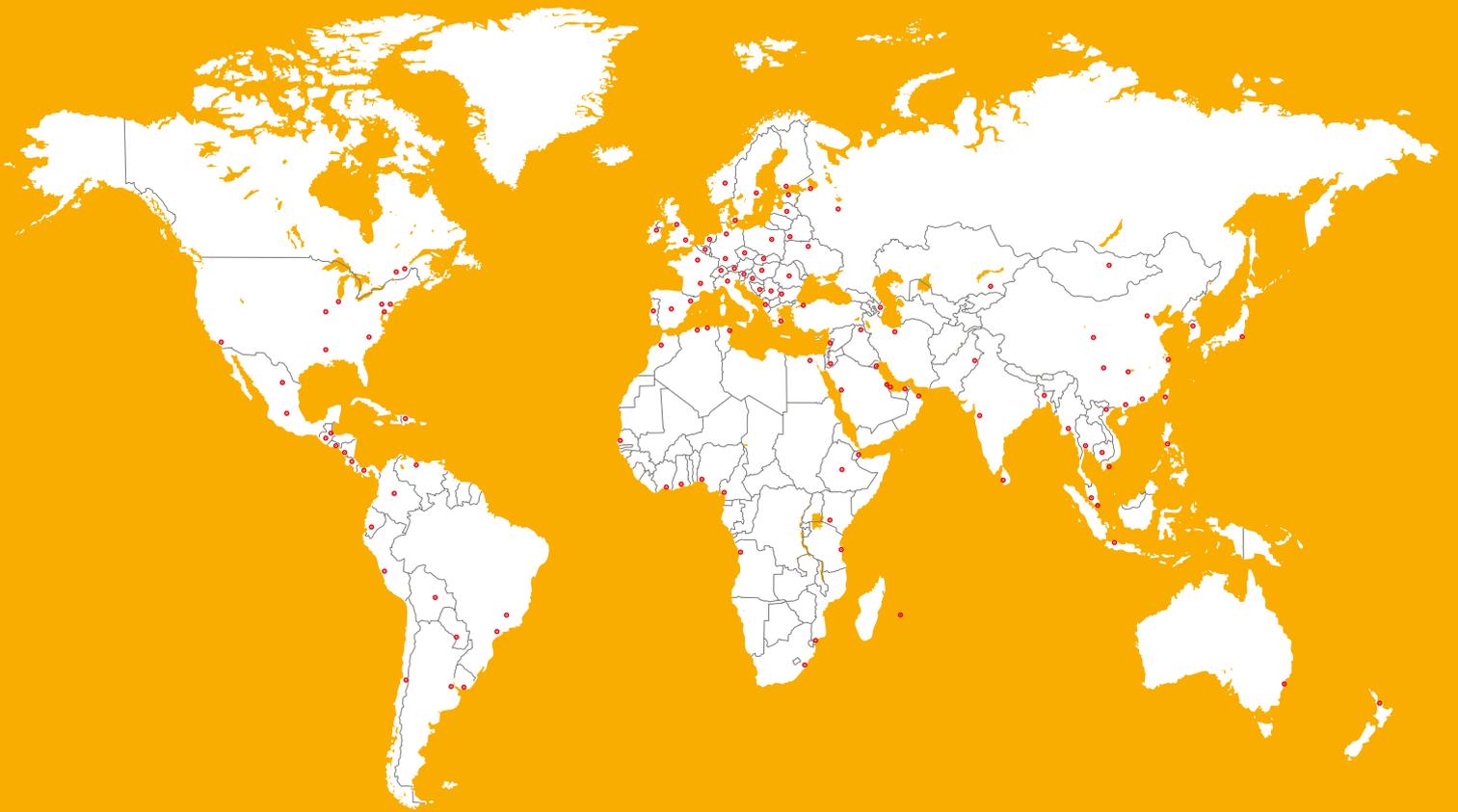
**50%**

OF ALL CARS PRODUCED WORLDWIDE USE SIKA PRODUCTS

**BUILDING TRUST**



# GLOBAL BUT LOCAL PARTNERSHIP



## FOR MORE INFORMATION ABOUT SIKA TUNNELING SOLUTIONS



### 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, industrial flooring as well as roofing and waterproofing systems.

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



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**BUILDING TRUST**

