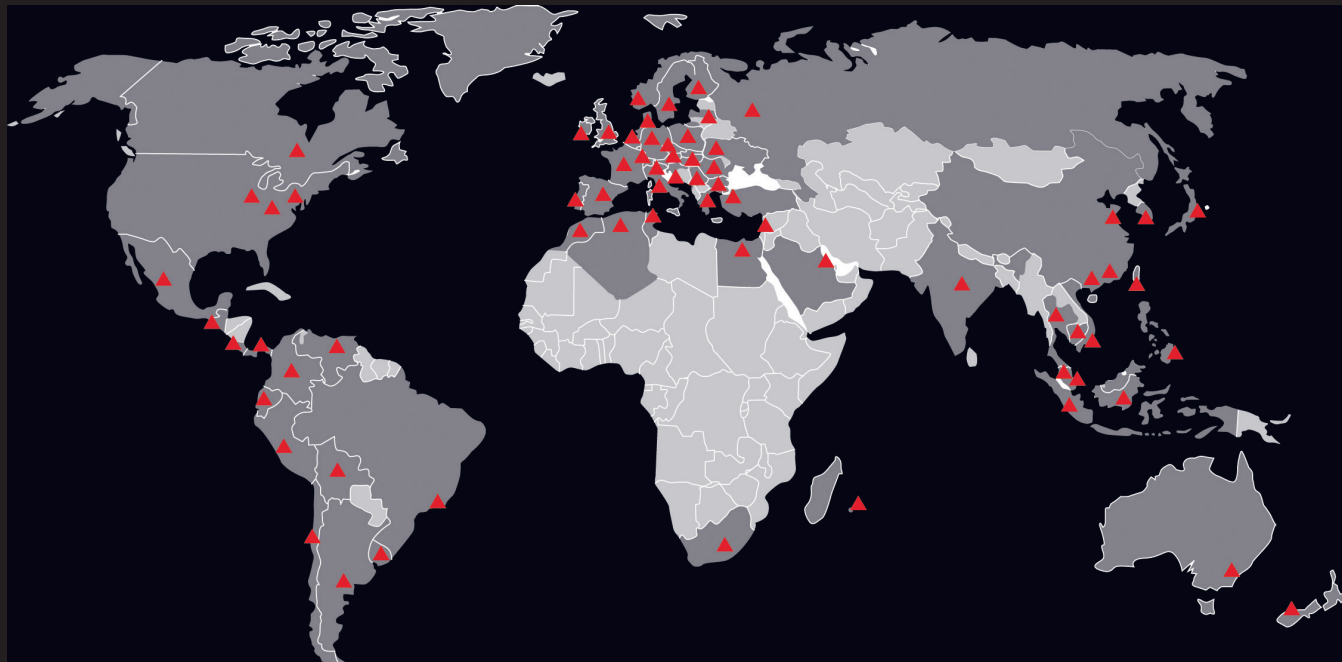


Sika. One Name. One Source. Worldwide.



All sales of Sika products are subject to Sika's current Terms and Conditions of Sale available at www.sikacorp.com or by calling 201-933-8800. Prior to each use of any Sika product, the user must always read and follow the warnings and instructions on the product's most current Technical Data Sheet, product label and Material Safety Data Sheet, which are available at www.sikaconstruction.com or by calling Technical Services at 1-800-933-7452. Nothing contained in any Sika materials relieves the user of the obligation to read and follow the warnings and instructions for each Sika product as set forth in the current Technical Data Sheet, product label and Material Safety Data Sheet prior to product use.

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The sale of all Sika products are subject to the following Limited Warranty:

LIMITED MATERIAL WARRANTY

SIKA warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Technical Data Sheet if used as directed within shelf life. User determines suitability of product for intended use and assumes all risks. Buyer's sole remedy shall be limited to the purchase price or replacement of product exclusive of labor or cost of labor.

NO OTHER WARRANTIES EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. SIKA SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS.

Contact Sika at:

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Sika Tunneling & Mining



Competencies

Key Project Management System



Road/Railway

Hydro Power

Metro Lines

Mining Facilities

Sika – with a global network

Sika AG, based in Baar, Switzerland, is a globally operating speciality chemicals company.

Sika is a leading supplier in the field of materials used for waterproofing and sealing, bonding, dampening, strengthening and protecting of concrete structures (buildings and infrastructure) and in industry (automotive, transportation, marine, building components, appliances and equipment).

The Sika product range includes high-quality concrete admixtures, speciality mortars, sealants and adhesives, dampening and strengthening materials, systems for structural strengthening, industrial floorings, waterproofing membranes, and roofing systems.

World-wide local presence in 70 countries and staff of 11,200 link up the customers directly to Sika and guarantee success for all partners. Sika generates yearly sales of more than 4.1 billion USD.

Sika Tunneling & Mining

Within the globally operating speciality chemicals group Sika AG, all business related to underground construction is managed by Sika Tunneling & Mining, pushing ahead all new developments concerning and offering them to our customers through local Sika companies worldwide.

- Construction Chemicals
- Equipment Solutions
- Waterproofing Systems

Ecology and economy

Sika is committed to the chemical industry's worldwide management of environmental resources system Responsible Care which establishes the principles regarding safety, health and pollution control.



Technical

Waterproofing Systems

- Sikaplan
- Sika Injectoflex
- Sikadur Combiflex
- FlexoDrain

Equipment Solutions

- Sika - F
- Aliva
- TBM - M
- Service



International Contractors

Regional/Local Contractors



Competence

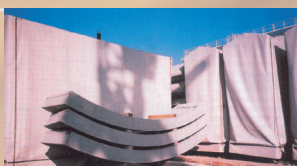
ment Solu-

PM
Robots
e



Construction Chem- icals

- Sigunit
- Sika ViscoCrete
- Sikagard
- SikaTard



Concrete Producers

Special Applicators

Precast Producers

Construction Chemicals



Tailor-made Customer Solutions

By using high-quality Sika admixtures for cast and sprayed concrete, the client profits from the high durability of his construction and the Tunneling contractor benefits by economizing his concrete mix design using Sika Admixtures.

Sprayed Concrete

Because of flexibility, speed, and economy, sprayed concrete is continuously gaining popularity in Tunneling and Mining.

New developments in the Sigunit®-AF range of setting accelerators and in the SikaTard® retarder range have lead to innovative application possibilities and allow the production of durable sprayed concrete to the highest quality specifications.

Cast-in-Place and Precast Concrete

Admixtures from Sika ViscoCrete® Technology enables the production of highly workable concrete, even at low water-cement ratios. Hence, increasing the durability of the concrete.

High early strength is one of the key requirements for precast concrete. Admixtures from Sika Rapid® Technology produce high early strength concrete without compromising the workability of concrete during placement.

Waterproofing Gunites

Sikacem® sprayed mortars are used for rehabilitation work in existing tunnels. High density and low permeability properties also allow using them for high-durability, thin-shell linings in new tunnels.

Injection Technology

The injection products from the SikaFix® and Sika Injection product ranges are used for the stabilization of perturbed or faulted geological zones, consolidation, sealing and waterproofing, and anchor grouting. Success is guaranteed with the use of Sika's high quality products and comprehensive professional service.



Specialty Products



Cement Grouts

Non-shrink, high performance and general purpose structural grouts



Chemical Grouts

Expanding, polyethylene chemical grout used to stop leaks



Anchoring Adhesives

High strength epoxy used for bolts, dowels, pins and anchoring



Mortars

Trowelable, pumpable and spray-applied mortars



Epoxies

High strength epoxies for grouting, sealing, patching, bonding, and crack filling



Structural Strengthening Systems

Fiber-reinforced wraps to improve structural strength



Sealants

Flexible, high performance, non-sag sealants for all types of joints

Equipment Solutions



Flexibility regarding design and use of machines and systems

Achieving perfect results with sprayed concrete is influenced by mix design and application. For this reason, we offer concrete spraying systems and admixtures for sprayed concrete to our customers, all from a single source.

Rotor machines

Aliva® Rotor machines are sturdy-built spraying machines suitable for spraying dry and wet concrete mixes. The material is conveyed according to the rotor principle. The mix is fed by thin-stream method up to the spraying nozzle. Automatically lubricated sealing plates reduce wear, and optimize the operating costs of the equipment.

Concrete Spraying Systems

Large volume concrete spraying and applying sprayed concrete to large sections call for mechanization of the spraying process. Highly mechanized concrete spraying systems are globally offered to the market by the alliance partners Sika and Putzmeister for this purpose. It makes no difference whether it's for mining, gallery excavation or Tunneling, **Sika-PM Systems** show their suitability for day-to-day use and their conception adapted to the needs of the customers. High-quality and high-performance concrete systems are created by combining the system components such as spraying boom, dosage unit etc. according to the customers needs and specifications and above all by choosing the ideal conveyor unit, twin-piston concrete pump by **Putzmeister®** or **Aliva®** rotor machines.

Immediate support by sprayed concrete in TBM Tunneling

When tunnels are driven by a tunnel boring machine, sprayed concrete is mostly applied mechanically. The concrete spraying robots used for this application are designed and built to the customer's needs and specifications and mounted onto the TBM. Performance parameters of the TBM must be observed, available space must be used optimally and the spraying process must be perfectly integrated into the overall logistic concept for advancing the tunnel. Various Aliva® solutions have been conceived on this bases and are very successfully used all over the world.



Waterproofing Systems



Thoroughly tested system concepts

Tunnel waterproofing membranes

The protection of underground structures against penetration of water is of great technical and economic importance.

Considering the intended purpose of tunnels, it is obvious that their waterproofing must meet particularly high quality and performance requirements. Safety regarding circulation as well as durability and the perfect functioning of all technical installations in the tunnel are of great importance. Membrane installation machines for Sikaplan® tunnel waterproofing membranes have been successfully used for many years. The efficient method for the installation of Sikaplan membranes, single rolls or preassembled sheets, ensures safety at work and maximum installation quality.

Joint Sealing

Besides waterproofing of the surface the system solution for many types of joints is a decisive factor for the functioning of the whole waterproofing system. Whether it is joints, connections to transverse galleries or invert-wall joints, there are in many places where transitions require reliable sealing. Sika Waterbars, Sikadur®-Combiflex® or SikaSwell® allow to design the correct and practical sealing solution for each joint.

Drainage Systems

The **FlexoDrain**, drainage system, used mainly in Tunneling, consists of half-shells and matching specially shaped pieces. The half-shells consist of a soft, fibre mesh reinforced membrane, shaped and supported by a steel wire skeleton. The half-shells can easily be fixed directly onto the rock surface by nailing pistol. Thanks to the fibre mesh reinforcement of the half shell's skin, concrete can directly be sprayed over the drainage shells.



Customers and Partners



Owner

Planner

Sika

Contractor

Global Partner for Concrete Spraying machines

Sika Tunneling & Mining is linked up to its customers and construction sites through a global network of agencies and partners spread throughout the world. Close cooperation of local Sika Companies with Sika Tunneling & Mining enables Sika to offer high-technology and practice-adapted product solutions for Tunneling and mining to the customers. To this end, all concerned are living «Together for innovative solutions» every day without fail. Geographical proximity assures maintenance and service for systems and machines, thus guaranteeing their reliability to the customer.



Experts on Sprayed Concrete

Strategic Alliance with Putzmeister

Sika and Putzmeister are joined in a global alliance for the field of Tunneling & Mining.

For our customers, this alliance ensures coordinated, innovative development of concrete spraying systems and admixtures, designed to meet the highest standards as required for highly mechanized concrete spraying.

In this alliance Putzmeister is in charge of world-wide production of the systems whereas Sika is assuming exclusive sales responsibility. Thanks to the know-how and development competence of both companies, the sprayed concrete technology package is benefiting from the latest innovations.

Complete customer service

The Sika companies and partners offer complete coverage of competent services in the field of our business activities.

Our staff has specific specialist knowledge and know-how in various fields. In cooperation with the Sika representatives all over the world we advise our customers and work out the best product or system solutions for the given problem.

Services offered by Sika Tunneling & Mining:

- Technical consulting and proposals
- Product and system quotations
- Qualification testing for cast and sprayed concrete
- Instructions for rock and soil consolidation injections
- Installation and maintenance of dosage units
- Starting up of systems / training courses for systems
- Repair / maintenance of machines
- Rental machines

