



CONCRETE SIKA SOLUTIONS FOR SPRAYED CONCRETE

BUILDING TRUST





SIKA SHOTCRETE TECHNOLOGY

Successful sprayed concrete requires the combination of many aspects of modern concrete technology especially concrete admixture chemistry, together with modern materials handling technology. The increasing demands for cost-effectiveness and the protection of health and the environment mean that sprayed concrete has been in continuous development. Sika's products for sprayed concrete represent the newest generation and cutting-edge technologies that have resulted from more than one hundred years of involvement in the business. With this experience, expert knowledge and a focus on performance and economy, Sika provides reliable proven solutions!

The multiple demands placed on sprayed concrete today no longer allow standard solutions. Dependent on the spray process and the type of structure, different conditions are imposed on the sprayed concrete during application and in service. In tunnel construction sprayed concrete is normally used for excavation stabilization, in open-pit mining and on major construction sites it is typically used for rock and soil stabilization on slopes. In bridge and other civil engineering repair and refurbishment works, sprayed concrete is often used specifically because formwork can thereby be dispensed with. Through more than 100 years of activity in these complex areas, Sika profoundly understands the difficulties and challenges and provides solutions that surmount them.



- 1 Excavation stabilization with shotcrete
- 2 Sika admixtures for an underground batching plant
- 3 Sika MiniShot - shotcrete testing in lab-scale
- 4 Slope stabilization with shotcrete

SIKA SHOTCRETE PRODUCTS

Sika is the expert in all the available technologies for sprayed concrete, including both the wet and the dry spray processes. This allows us to provide the optimum solution for each type of project and application, including the development of our own sprayed concrete machines at Aliva® AG. When combined with our research, development and globalized production of specialist sprayed concrete admixtures, such as Sigunit® and Sika® ViscoCrete®, plus our years of experience in tunneling, mining and on all types of major construction projects, this makes Sika the ideal partner for owners, designers and contractors on any type of sprayed concrete works.

Continuous innovation is the key to the global success of Sika products for sprayed concrete, mastering the increasing demands for environmental protection, cost-effectiveness and performance in service. Successful projects and references all around the world speak for us. Major new structures such as the Gotthard Base Tunnel in Switzerland and the Karahnjúkar Hydroelectric Dam in Iceland are being built today with Sigunit® and Sika® ViscoCrete® technologies. These systems are of course produced subject to the requirements of the international „Responsible Care®“ environmental management system, which also requires continuous improvement in the areas of health and safety, as well as the protection of the environment.



**Sigunit®**

Shotcrete accelerators, available as liquid, powder or instant powder, for the highest strength development, ideal for overhead applications and building-up thicker layers.

**Sika® ViscoCrete® SC**

High range water reducing superplasticizers for better workability of the concrete mix, higher compressive strength and increased durability of the shotcrete.

**SikaTard®**

Cement hydration stabilizer to ensure long term stabilization of the concrete mix, enabling optimum shotcrete application with the highest flexibility - Always just in time.

**SikaPump®**

Pumping aids improve the pumpability of the concrete mix. For a smooth pumping process over long distances and time, with minimal friction and wear on the equipment.

**SikaTell®**

Colloidal silica additive for stabilizing the concrete mix cohesion and thereby reducing rebound and improving the long-term durability of the shotcrete.

**SikaFiber®**

Steel or synthetic fibers used to increase the resilience and energy absorption of the shotcrete. Highest performance with maximum efficiency.

**SikaFume®**

Micro silica additives that significantly improves the shotcrete and its durability: Optimum adhesion and minimal rebound, followed by watertight durability.

**FlexoDrain**

Substrate drainage system installed to allow the shotcrete application in case of moderate water ingress and protecting the lining from aggressive mountain water.

**Aliva®**

Specialist equipment for all types of wet and dry process shotcrete application and accelerator dosing. Off-the-shelf and tailor-made solutions.

**SikaCare**

Reduces the adhesion of cement mortar and concrete to the equipment, allowing extended use, lower wear and easier cleaning after the application.

**SikaPump®-Start 1**

Lubricant for concrete pumps, significantly reducing the friction between concrete and hoses/pipes, during the start-up of the pumping process.

**SikaShot®**

Highly accelerated spray mortar for consolidating and pre-sealing the substrate. Ideal pretreatment under difficult conditions for the optimum shotcrete lining.

SIKA SUPPORT SERVICES

Sika – Expertise to Support Your Project

For more than 100 years Sika has provided products and systems for the concrete construction industry and especially for tunneling. Sika expertise and experience enables processes to be streamlined, costs to be saved, the environment protected and health and safety to be improved. Our global network combines R&D, Engineering and concrete technicians to provide local support on your shotcrete projects. This is provided throughout the design and on-site construction phases. Full documentation is available in hard copy and online including shotcrete handbooks, brochures, method statements and case studies.

Sika® MiniShot

The unique Sika® MiniShot system represents a downsizing of the entire shotcrete process to provide a reliable and valid laboratory testing method for shotcrete performance. It comprises the MiniShot, a highly accurate dosing system, and the pulsment, an ultra sound spectrometer for non-destructive strength measurement. As a result, it is now possible to investigate the interaction of chemically reactive shotcrete components in a fast, easy and reliable way in order to fulfill three main tasks:

- Development of tailor-made shotcrete admixtures
- Creating cost-performance optimized shotcrete mix designs
- Quality control for ongoing projects

SikaSprinter

The SikaSprinter is a unique independent spraying system, which was especially designed for performing initial tests on site and for smaller projects, where the infrastructure does not allow the operation of normal shotcrete equipment. The SikaSprinter includes a 40 tons truck base unit, a Sika®-PM 500 and generator for autonomous spraying. The equipment is operated by an EFNARC certified nozzleman, who is also able to analyze the entire shotcreting process from batching through spray application to equipment maintenance.

Sika Academy

The Sika Academy imparts this huge bank of knowledge to Sika personnel and their clients. Use of the latest interactive training methods ensures a high level of retention and successful knowledge transfer. Sika provides both practical and technical training for the shotcrete business: training Nozzleman and developing our own Shotcrete Specialists. Both programs are executed under real conditions and include detailed information concerning the technologies employed, the available equipment and application, mix design, quality control and troubleshooting.



SIKA SHOTCRETE WORLDWIDE



Gotthard Base Tunnel, Railway, Switzerland

As of 2017, the new flat trajectory railway through the Swiss Alps will link Europe's high-speed railway networks. The core of the new link is the Gotthard Base Tunnel with a length of 57 km. Sika was and is a significant participant in the excavation stabilization for the expansion of this project that has already been described as the 'structure of the century'.



East Side Access, New York City Subway, USA

This is one of the largest infrastructure projects in the USA, designed to bring the Long Island Rail Road into a new East Side station to be built below, and incorporated into, Grand Central Terminal. Shotcrete is used to line areas that have unusual shape, where standard cast-in-place lining cannot be used, including stations, cross-overs and arches.



Potrillo Dam, Hydropower, Argentina

The project consists of an earth dam supporting a 1.300 hectare reservoir. This is 116 meters high, with a central impermeable core tunnel of different diameters, shape and section lengths within its overall 15 km. These were all lined with entirely shotcrete using Sigunit accelerators through a robot arm.



Pongkor Mine, Indonesia

The Pongkor Gold Mine is operated by ANTAM and is located in West Java, Indonesia. Gold ore is sourced from 3 different veins through conventional and mechanized cut and fill mining. Sika Indonesia is a longstanding partner of the Pongkor mining team and supplies a range of products to the project, which include shotcrete admixtures and fibers for an efficient construction, strengthening and stabilization of the important mine's underground infrastructure.

GLOBAL BUT LOCAL PARTNERSHIP



FOR MORE 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, 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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