



# CONCRETE SIKA TECHNOLOGIES FOR MINING

# SIKA TECHNOLOGIES

SOLUTIONS FOR MINING

## IF IT CANNOT BE GROWN IT HAS TO BE MINED

In our fast growing world natural resources like iron, copper or coal are crucial for the products of our daily lives. The growth of the world population and the increasing demand for higher living standards all over the world feed the hunger for those resources. Therefore the mining industry is growing fast, new mines are opening or existing mines are expanding towards deeper areas and increased output. The need for fast rock support like shotcrete (sprayed concrete) or durable transport infrastructure made out of concrete is growing accordingly.

Sika can provide dedicated products, expert knowledge and service in modern day mining.



### SHOTCRETE

Sprayed concrete unites multiple aspects of modern concrete technology with respect to materials handling technology as well as concrete admixture chemistry. Sika masters all the technologies of sprayed concrete, from wet to dry spray applications.

**Sika® ViscoCrete® SC**  
Superplasticizer

**SikaTard®**  
Shotcrete retarder

**SikaPump®**  
Pumping agent

**FlexoDrain®**  
Water drainage system

**Sigunit®**  
Accelerator

**SikaFiber®**  
Micro/macro synthetic and steel fiber

**Sika®-PM**  
Concrete spraying systems

**Aliva® rotary machines**  
Concrete spraying machines

**Sika® Shot-3**  
Ready mixed gunite



### CONCRETE

Since 1910 Sika has made a notable contribution to the development of concrete as a durable building material. Sika, a full range supplier, meets the diverse complexity of the entire concrete production and construction process with solutions for all requirements.

**Sika® ViscoCrete®**  
Superplasticizer

**Sika ViscoFlow®**  
Admixture

**SikaRapid®**  
Accelerator

**Sika® Stabilizer**  
Viscosity modifying agent

**SikaPump®**  
Pumping agent

**SikaPump® Start-1**  
Lubricant agent

**SikaFume®**  
Silica fume

**SikaFiber®**  
Micro/macro synthetic and steel fiber

**SikaCare**  
Equipment protection



### COATING

Sika offers a range of coating products that either protect your structure from abrasive and chemically aggressive fluids or seal entire containment structures. Sika's coating products protect specific mining infrastructure on a large scale such as process water retention basins, thickeners, leach tanks, flotation cells and tailings processing and storage facilities.

**Sikalastic®**  
Sika's standard coating product, it is polyurea based and is suited to a whole range of applications. A highly chemical resistant modification of Sikalastic® is used to protect equipment and structures that are exposed to aggressive and chemical fluids.

**Sikagard®**  
The standard epoxy coating from Sika for a wide range of coating applications.



### GROUTING

Heavy machinery such as mills, crushers and hoists are key components in large scale mining operations. Grouts play an important role in transferring vibrations and heavy loads to the foundations. Expanding, non-shrink grouts fill tight voids with highly effective bearing areas, fast and with high strengths. Sika offers a whole range of grouting solutions including epoxy, cementitious, acrylic and polyurethane materials.

**Sikadur®, SikaGrout®**  
A range of high performance, high precision, cementitious, acrylic or epoxy grouting materials.

**Icosit®-KC**  
A 2-component polymer grout, especially designed for fixing heavy machinery and reducing vibration transmission.



### INJECTION

Fast cycle times are important for an efficient mining operation. Therefore, the SikaFix® range provides effective and innovative injection solutions including polyurethane, silicate, cementitious and acrylate materials for all possible injection and ground stabilization problems.

**SikaFix®**  
A fast reactive injection product which expands with or without contact with water, mainly injected using a 2-C pump. The SikaFix® range of injection products are suited for immediate water blocking under high water ingress and high pressure conditions.



### SPECIAL FLOORING

Sikafloor® provides efficient solutions for working areas that endure constant loads and need to be highly impact resistant. Sika flooring products can be found in mine workshops and inventories all around the globe. Cementitious, resin and polyurethane systems are available for all types of flooring.

**Sikafloor®**  
Fast commissioning and high chemical, thermal and mechanical resistant floor for truck workshop locations that have to endure constant heavy loads and impacts.

**Sikafloor Epocem®**  
For repair and leveling of existing concrete. Pavement joints are sealed with elastic polyurethane.

# SIKA TECHNOLOGIES FOR MINING

## SHOTCRETE APPLICATIONS



### SLOPE STABILIZATION

Slope stabilization is used among other methods for increased critical slope angles and mine portals to secure the working area.



### ROCK SUPPORT

High efficiency in the application as well as development of highest early strength are required for the application of shotcrete in underground mining.



### SHOTCRETE EQUIPMENT

Sika® Aliva® und Putzmeister are able to supply shotcrete equipment for all types of shotcrete.



### SIKA SERVICE

Sika is ready to support our mining customers from pre-testing to continuous mine site support. From logistics to ongoing optimization and meeting new challenges.

## MAIN REQUIREMENTS OF SHOTCRETE IN MINING



### High early strength with Sigunit®

Earliest setting for a safe and efficient application are key elements for shotcrete in mining.



### Long slump retention with Sika® ViscoCrete® SC technology

Depending on the location and size of the mine, very long transport distances are necessary to supply the shotcrete to the application site.



### Laboratory testing

Sika has developed a testing device called "MiniShot" where local raw materials (e.g. binder system), shotcrete accelerators etc. can be tested in a fast and resource saving way. MiniShot labs are located in all major mining regions.



### On site testing

After the preselection with the MiniShot system the findings are tested under real conditions. For this purpose well trained shotcrete technicians complete the local shotcrete team to achieve best cost performance for the specific mining application.



### Trouble-free application

High performance, speed and therefore no interruptions are important requirements for shotcrete in mining. This is achieved by the perfect mix design of shotcrete in combination with an efficient and reliable admixtures.



## SIKA PRODUCTS

### Sika® ViscoCrete® SC

Superplasticizer with very strong water reduction and long workability time.

### SikaTard®

Slump retention admixture, especially formulated for shotcrete, to control workability time for all temperature conditions.

### SikaPump®

Special pumping aids to improve pumpability under difficult circumstances and/or long transport distances.

### FlexoDrain®

FlexoDrain® is an easy to use drainage system to handle water ingress in mining.

### SikaTell®

Rebound reduction and improvement of the cohesion of the shotcrete can be achieved by the use of SikaTell®.

### Sigunit®

Shotcrete accelerators for high early strength requirements. Sigunit® is available as a liquid solution or as a powder to meet the challenging logistics for mining operations.

### Sika® Shot-3

Sika® Shot-3 is a cement based, powerfully accelerated single component, ready mixed gunite with precise granulometry and sealing additives.

### SikaFiber®

Fibers can significantly improve the ductility and the tensile strength of concrete.

### Sika®-PM

A range of robust and reliable concrete spraying machines built for the rough working conditions underground.

### Aliva® rotary machines

The Aliva® rotary machines are universal machines for the application of dry and wet shotcrete in the thin-flow process.

# SIKA TECHNOLOGIES FOR MINING

## CONCRETE APPLICATIONS



### ROCK REINFORCEMENT

Strong, fast and reliable rock reinforcement is the key in underground mining. The designed concrete has to withstand the demanding conditions of underground mines.



### ROAD CONCRETE

Transport routes especially those experiencing high volumes of traffic and/or concentrated loads like heavy mining equipment, are subject to high mechanical stress and strong abrasion.



### BACKFILLING

Backfilling becomes more and more important to mining operations and with the use of admixtures, various characteristics of the backfill can be positively enhanced.



### SLICKLINE CONCRETE

A suitable concrete mix design and the right admixtures are essential for the concrete to be transported without segregation and blocking of the lines.

## MAIN REQUIREMENTS OF CONCRETE IN MINING



### High early strength with SikaRapid® technology

In order to decrease cycle times in underground operations high early strength is needed to achieve the required compressive strength as fast as possible.



### Long workability time with Sika® ViscoCrete® & ViscoFlow® technology

The workability time of the concrete is essential in mining applications, especially for pumped concrete. The transport distances and the temperature are challenging factors to the workability requirements of the concrete.



### Good pumpability with SikaPump®

A pumping agent reduces friction and resistance in the pipe, reduces the wear on the pump and the pipes and increases the volume output. A lubricant mix is intended to coat the internal walls of the pipe with a high-fines layer to allow easy pumping from the start.



### High resistance against abrasion with SikaFiber®

In order to boost resistance against percussive or striking impact, the toughness and flexural strength of the concrete must be improved.



### High flowability with Sika® ViscoCrete® technology

An efficient way of fast and easy placing of concrete is the use of self-compacting concrete. It is able to flow under its own weight, completely filling formwork and achieving full compaction without vibration, even in the presence of congested reinforcement.



## SIKA PRODUCTS

### Sika® ViscoCrete®

Superplasticizer with very strong water reduction and long workability time.

### Sika ViscoFlow®

Special designed admixture for long workability times under demanding conditions.

### SikaRapid®

The acceleration of strength development, especially high early strength, is easily achievable with the use of the SikaRapid® technology.

### SikaStabilizer®

Variations in the raw materials can be compensated by the use of a SikaStabilizer® to improve the cohesion of concrete mix.

### SikaPump®

Special pumping aids to improve pumpability under difficult circumstances and/or long transport distances.

### SikaPump® Start-1

SikaPump® Start-1 is a lubricant for the tubes in and reduces the wear and tear of the pumping equipment.

### SikaFume®

SikaFume® strongly enhances the durability of the concrete.

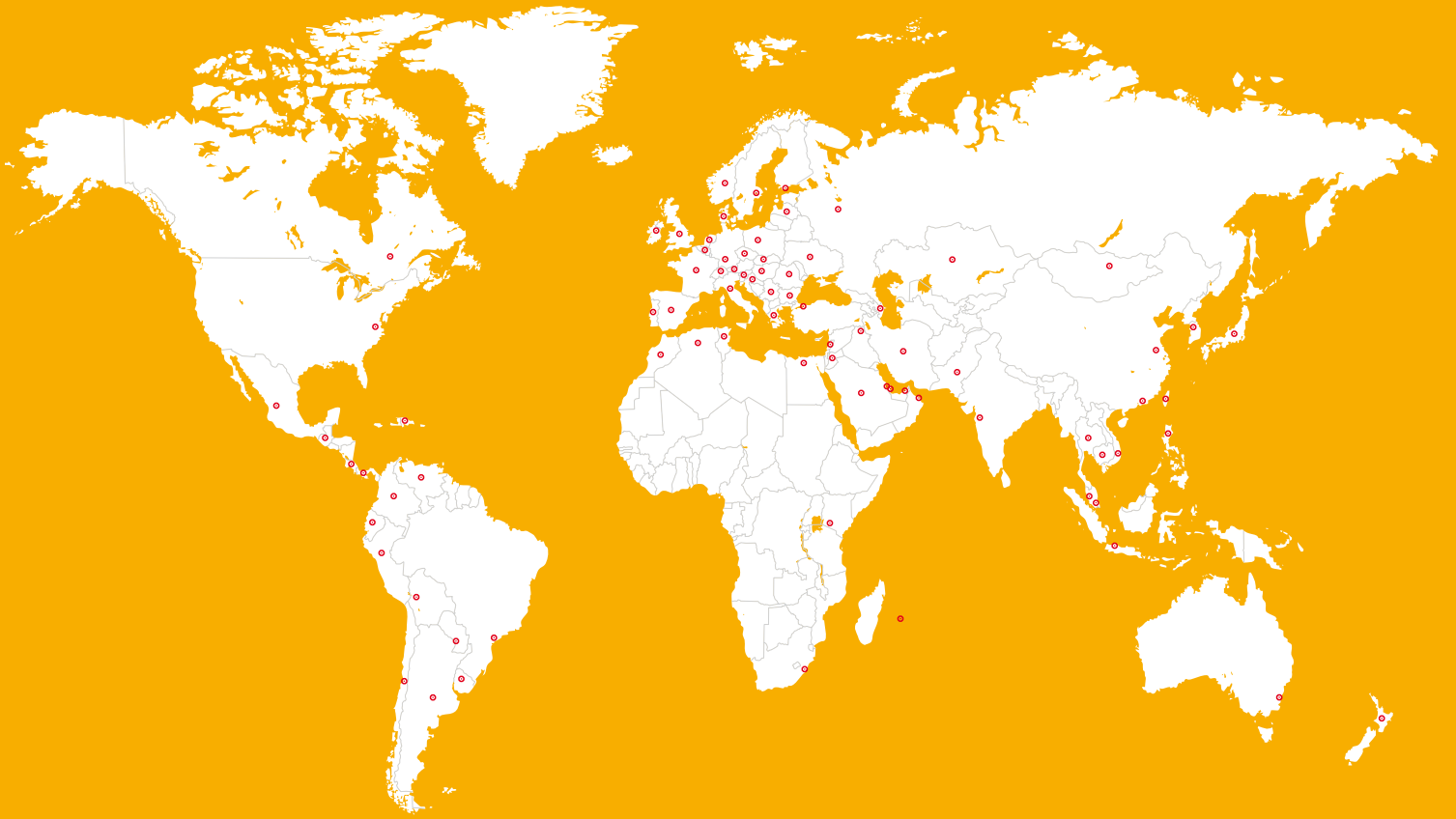
### SikaFiber®

Fibers significantly improve the ductility and the tensile strength of concrete.

### SikaCare

SikaCare is an easy applicable protecting agent against rust and concrete sticking to metal parts of the equipment.

# GLOBAL BUT LOCAL PARTNERSHIP



## FOR MORE INFORMATION:



### WHO WE ARE

Sika AG, Switzerland, is a globally active specialty chemicals company. Sika supplies the building and construction industry as well as manufacturing industries (automotive, bus, truck, rail, solar and wind power plants, façades). Sika is a leader in processing materials used in sealing, bonding, damping, reinforcing and protecting loadbearing structures. Sika's product lines feature high quality concrete admixtures, specialty mortars, sealants and adhesives, damping and reinforcing materials, structural strengthening systems, industrial 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.



### SIKA SERVICES AG

TM Concrete  
Tüffenwies 16  
CH-8048 Zürich  
Switzerland

### Contact

Phone +41 58 436 40 40  
Fax +41 58 436 41 50  
www.sika.com

**BUILDING TRUST**

