



MASTER[®]
» BUILDERS
SOLUTIONS

■ - BASF
We create chemistry



Solutions for Rock Bolting



Innovative Solutions for Strata Control

The demand for the world's mined resources is forcing mine operators to work at ever greater depths. Increased excavation depths lead to higher geotechnical challenges, such as higher rock stresses affecting the stability of the strata. Working at ever greater depths with potentially unstable strata increases the need for enhanced personnel safety within the mine environment.

How fast and how safely a mine can be developed is a critical factor of efficient mining. With the Master Builders Solutions brand portfolio, BASF offers products that facilitate safe ground stabilization while improving mine productivity. Developed for placement of cable and rock bolts in underground mines, our innovative solutions improve cycle times for both cable and rock bolt installation, while increasing worker safety and strata control.



Tested in operational mines and exposed to the most challenging of working conditions, our solutions for grouting and anchoring make mining in all conditions a safer, more productive environment.

MasterRoc® RBA 380 rock bolting resin fills cracks down to ≥ 0.14 mm

Tensile test with hollow rock bolts

Test No.	Setting Time	Rock Bolt Type	Maximum Tensile Load [kN]	Accompanying Displacement [mm]
1	4 hours	R32S	358	31
2	4 hours	R32S	346	22
3	4 hours	R32S	378	33

Tensile pull strength testing with 600 mm encapsulation length according to DIN 21521. In additional external tests, BASF could prove final load bearing capacity after only a few minutes.

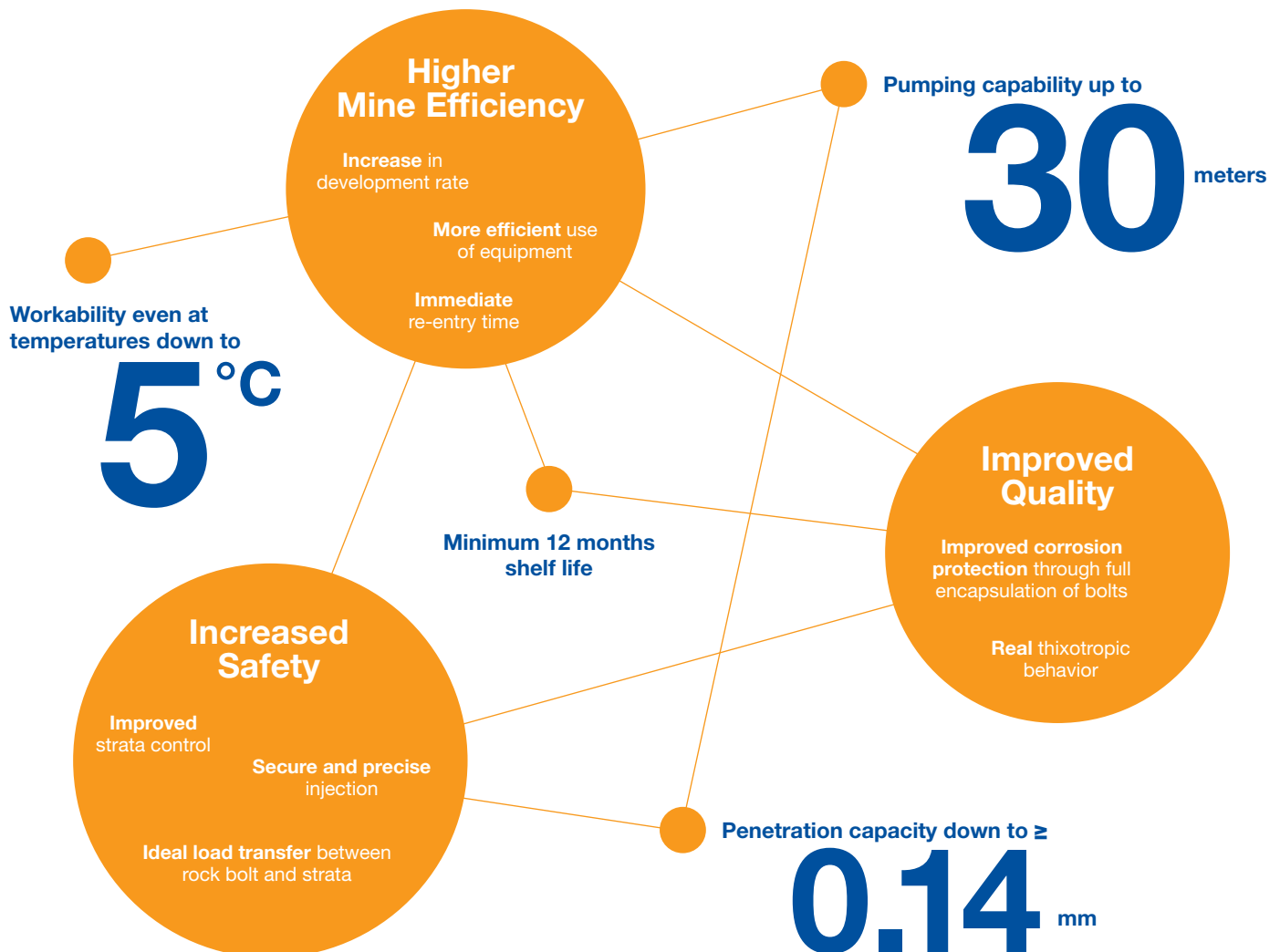


Improve Your Rock Bolting Performance

MasterRoc® RBA 380 is a fast reacting two component polyurea silicate injection resin for rock bolt installations. It offers many advantages due to its unique thixotropic behavior which allows for overhead applications without additional sealing, filling even

the smallest cracks (≥ 0.14 mm). The long-distance pumping capability is up to 30 m (100 ft). It keeps miners safe during bolting due to its fast curing and strength development.

Benefits at a glance:





Versatile System Tailored to Your Underground Construction Needs

The conditions underground vary from mine to mine. Rock temperatures ranging from -5 °C (23 °F) up to 60 °C (140 °F) influence the curing speed of reactive resins. Different pumping lengths require different set times. BASF underground construction specialists advise customers about the optimum product choice for their application.

For the installation of various rock bolt types:

- Self-drilling anchors (SDA)
- Full rebars
- Cable bolts
- Composite fiber bolts
- Hollow bars



Self-drilling anchor with MasterRoc RBA 380

Rock Bolting Portfolio

BASF offers a wide range of rock bolting solutions. Besides reactive resins, the MasterRoc RBA portfolio also includes ready-to-use cementitious products and various admixtures for OPC based grouts to adjust the physical behavior and mechanical properties, such as shrinkage compensation, corrosion protection, pumping capacity, and tensile bond improvement.

Cementitious grout with and without corrosion inhibitor



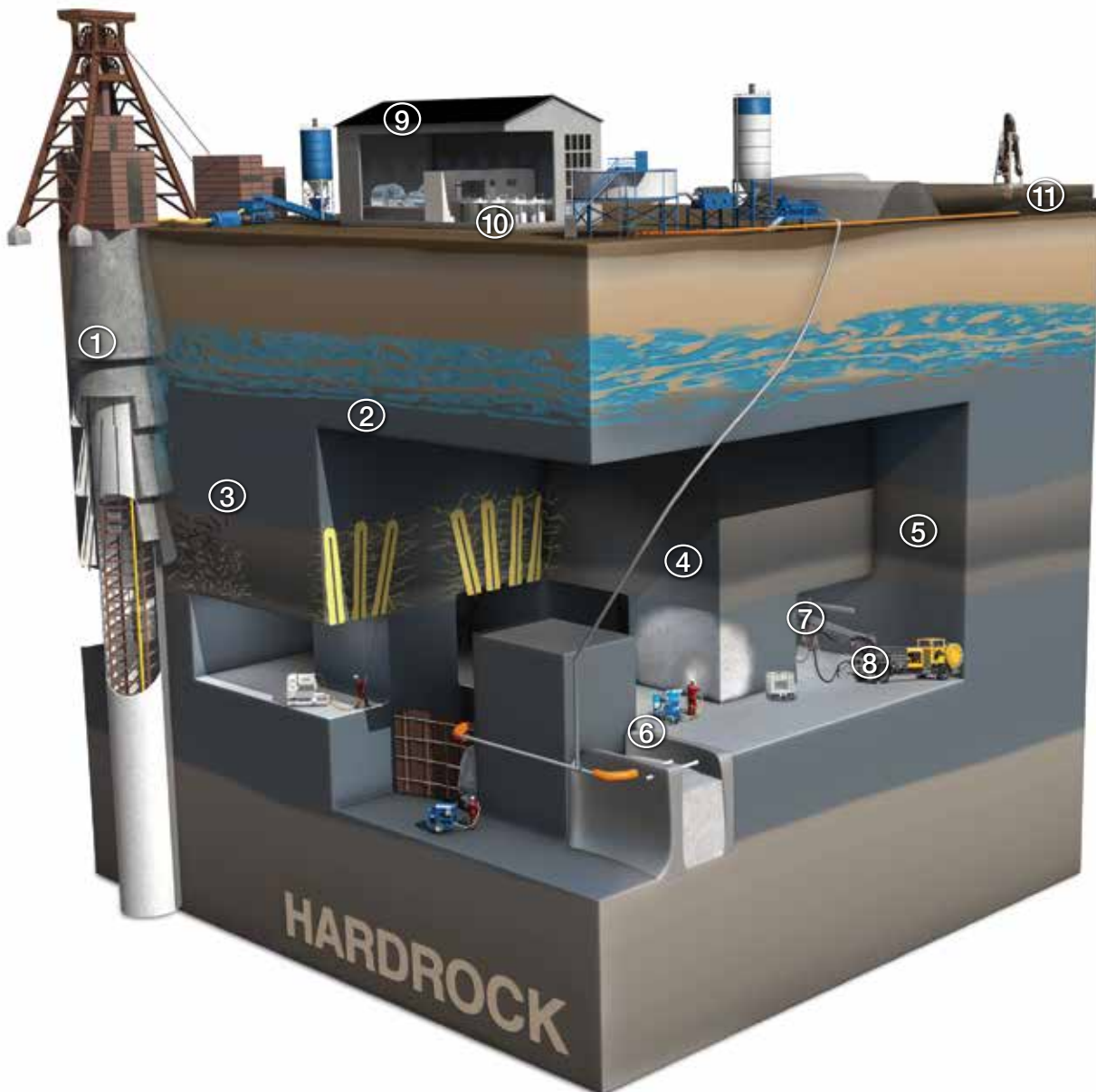
With corrosion inhibitor



Without corrosion inhibitor



Our Comprehensive Portfolio for Mining



- | | |
|-----------------------------|--------------------------|
| ① Pre-Injection | ⑥ Mine Backfill |
| ② Rock Bolting | ⑦ Admixture for Concrete |
| ③ Injection | ⑧ Roadway Concrete |
| ④ Thin Spray-on Liner (TSL) | ⑨ Grinders |
| ⑤ Sprayed Concrete | ⑩ Flotation |
| | ⑪ Tailing Pond |



Global Network of Underground Specialists

BASF, with its global underground construction team, is a world leader in the provision of reliable, customer-oriented solutions focused on your needs in the tunneling and mining industries. We recognize that your success depends on our ability to deliver solutions that meet or exceed your critical needs.

By accompanying you at the start of your project and understanding the issues that are important to you, we can contribute to your success. We support you with product training and quality control, and our professional technical service team is on hand around the clock, helping you with technical advice and troubleshooting.



Hands-on training



BASF provides technical injection training courses on a frequent basis located in the Hagerbach underground facility in Switzerland. The courses are organized both as demonstration workshops in realistic underground settings and as practical injection operator training. The demonstration workshops are “show-and-tell” sessions that aim to visualize and explain the possible types of applications and the technical performance of our injection systems. The practical injection operator training is

offered exclusively to injection customers who are working with BASF injection systems. During this training the participants are given the chance to work in small groups, taking part in hands-on exercises under the supervision of experienced instructors. The main objective is to gain practical skills for the correct application and execution of injection work. In addition, customized training is available for customers upon request.



Master Builders Solutions from BASF

With more than a century in the construction industry, the Master Builders Solutions brand brings all of BASF's expertise together to create chemical solutions for new construction, maintenance, repair and renovation of structures.

The know-how and experience of a global community of BASF construction experts form the core of the Master Builders Solutions brand. We combine the right elements from our portfolio to solve your specific construction challenges. We collaborate across areas of expertise and regions and draw on the experience gained from countless construction projects world-wide. We leverage global BASF technologies, as well as our in-depth knowledge of local building needs, to develop innovations that help make you more successful and drive sustainable construction.

Our comprehensive portfolio

- Concrete admixtures
- Cement additives
- Chemical solutions for underground construction
- Waterproofing solutions
- Sealants
- Concrete repair and protection solutions
- Performance grouts
- Performance flooring solutions





Master Builders Solutions from BASF for the Construction Industry

MasterAir®

Solutions for air-entrained concrete

MasterBrace®

Solutions for concrete strengthening

MasterCast®

Solutions for the manufactured concrete products

MasterCem®

Solutions for cement manufacture

MasterEmaco®

Solutions for concrete repair

MasterFiber®

Advanced solutions for fiber reinforced concrete

MasterFinish®

Solutions for formwork treatment

MasterFlow®

Solutions for precision grouting

MasterGlenium®

Solutions for high-performance flowing concrete

MasterInject®

Solutions for concrete injection

MasterKure®

Solutions for concrete curing

MasterLife®

Solutions for enhanced durability

MasterMatrix®

Advanced rheology control solutions for self-consolidating concrete

MasterPel®

Solutions for watertight concrete

MasterPolyheed®

Solutions for moderate slump concrete with superior finishability

MasterPozzolith®

Solutions for conventional slump concrete

MasterProtect®

Solutions for concrete protection

MasterRheobuild®

Solutions for high slump concrete

MasterRoc®

Solutions for underground construction

MasterSeal®

Solutions for waterproofing and sealing

MasterSet®

Solutions for set control

MasterSure®

Solutions for workability control

MasterTop®

Solutions for industrial and commercial floors

Master X-Seed®

Solutions for strength enhancement

Ucrete®

Flooring solutions for harsh environments

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