

Mineral Bolt is a 2-component, high strength organo-mineral resin for rock bolt installation. It is suitable for fixing mechanical bolts or anchors in the borehole (e.g. in combination with DSI Hollow Bar System), grout stabilization (for heavily cracked rock mass), gas sealing and water stopping. Mineral Bolt is available in several versions varying in reaction times and thixotropy effect.

Advantages

- Adjustable setting time
- Can be used in wide range of temperature
- Excellent for mechanised automatic application
- Allow to speed the tunnel, gallery face development (no waiting for cement to cure to 50 [MPa])
- Excellent for difficult ground condition
- Removes operator judgement from mixing

Components

	Unit	Mineral Bolt comp. A	Mineral Bolt comp. B
Appearance	-----	Pale yellow liquid	Dark brown liquid
Density at 20 [°C]	[g/cm ³]	1.45±0.04	1.21±0.04
Viscosity at 25 [°C]	[mPas]	300±50	220±50
Viscosity at 10 [°C]	[mPas]	950±50	850±50

Material Properties

	Unit	25 [°C]	10 [°C]
Foam Factor	-----	1.0	1.0
Max. Reaction Temp.	[°C]	< 130	< 125
Compressive Strength*	[MPa]	> 60	> 60
Flexural Strength*	[MPa]	> 60	> 60
Pull-out strength according to DIN 21521	[kN]	> 220 after 3 minutes > 310 after 15 minutes	

*Results obtained under laboratory condition

Reaction parameters

	Unit	MI	FAST	MEDIUM	SLOW	ULTRA SLOW
Consistency after mixing (A+B)	-----	very high viscous liquid	high viscous liquid	viscous liquid	viscous liquid	viscous liquid
Reaction Start Time	[s]	5 - 35	45-60	105	180	285
Tack Free Time	[s]	50-70	70-90	180-360	480-600	600-720
Shore Hardness after 15 minutes	[°]	60D	--	--	--	--
Shore Hardness after 60 minutes	[°]	60D	--	--	--	--

*Results obtained under laboratory condition at 20 [C] deg.

Application

The components Mineral Bolt A and Mineral Bolt B shall be pumped using a two-component pump as commonly used in the mining and tunnelling industry with a volumetric ratio of 1:1. It is recommended to use a static mixer of the type: M-10x360 (part no. M-10x360) or an equivalent.

Components mixing ratio:

	Mineral Bolt component A	Mineral Bolt component B
by volume [v/v]	100	100
by weight [m/m]	120	100

If components A and B are mixed at a different mixing ratio, the reaction time and mechanical properties may deviate from above specifications.

Cleaning of the Injection Pump and Accessories

The cleaning of the application equipment must be carried out thoroughly with great attention. Pumping system, valves, mixing equipment and hoses must be cleaned immediately after the injection process has been completed. Thoroughly rinse the components that have not yet been reacted with a gasket-friendly cleaner, change the cleaning liquid several times during each cleaning process and collect it for disposal. Reacted resin can only be etched and mechanically removed. To be sure, read the technical description of the injection pump and the data sheet of the cleaner used, carefully. Please refer to the pump manufacturer's operating manual for detailed instructions.

Packaging

Type of packaging	Component	Weight [kg]		Catalogue number
Plastic container	A	37		MB-VER-A-25P
	B	30		MB-VER-B-25P
Metal container 20l	A	28		MB-VER-A-20M
	B	23		MB-VER-B-20M
Metal drum 200l	A	290		MB-VER-A-200M
	B	240		MB-VER-B-200M
IBC container 1000l	A	1450		MB-VER-A-1000
	B	1200		MB-VER-B-1000

Other packaging possible on the request

For selected resin use appropriate version (VER) descriptor:

Mineral Bolt MI = MI, Mineral Bolt Fast = F, Mineral Bolt Medium = M, Mineral Bolt Slow = S, Mineral Bolt Ultra Slow = US

For instance, for Mineral Bolt Fast component A, version descriptor is F (VER = F), catalogue number: MB-F-A-25P.

Storage and Transport Conditions

Both resin components are delivered in canisters - made of plastic or sheet metal - (other packaging is possible on request). The recommended storage in dry and airy rooms, at a storage temperature of 10[°C] to 30[°C]. The guaranteed shelf life from the date of manufacture is 12 months for **Mineral Bolt A component** and **Mineral Bolt B component** only in unopened original packaging.

Tests and Approvals

The system meets the German mining approval standards according to the Arnsberg District Government Department 6 Mining and Energy/ NRW-Requirements:

1. Reaction temperature and flash point. DMT GmbH.
2. Material consistency and auto-ignite determination.
3. Determination of compressive, bending and tensile strength. Central Mining Institute.
4. Compilation with NSW Australian Mining Standards. Mine Safety Technology Centre.
5. Determination of water tightness. IMBiGS.
6. Utility tests of rockbolt resin Mineral Bolt Fast and Ultra Slow with hollow rockbolts R32-360 according to DIN 21521.
7. Mining hygiene testing and assessment of two-component systems for rock consolidation in accordance with §10 of the Mining Ordinance for Hard Coal Mines (BVOST) and §18 of the Mining Ordinance for ore mines, rock salt mines and for rock and earth operations (BVOESSE) in conjunction with DIN 22100. Hygienic Institute, Gelsenkirchen, August 2018.
8. Material consistency and auto-ignite determination. DMT GmbH.

Environment and Safety Instructions

Empty containers can be disposed of within Germany via local disposal companies, subject to their terms and conditions. The materials will not be taken back to the production site or to the distribution depots. Please refer to the safety data sheets for information on the disposal of the remaining materials, as well as of the empty containers.

During application of our products, the applicator is obliged to comply with the applicable protective regulations and with the safety data sheets of **DSI Schaum Chemie**. According to Annex II of EU Regulation 1907/2006, the safety data sheets must be available to all persons responsible for occupational safety, health protection and handling of the materials. Processing and cleaning of the equipment may only be carried out in protective clothing with safety gloves and safety goggles. According to current knowledge, the use of a suitable skin protection cream is recommended. Skin contamination must be cleaned with soap and water. If splashes get into the eye, it must be immediately rinsed with water and a doctor must be consulted without delay. The material must not be allowed to enter the sewage system or the ground in unmixed condition.

Liability Disclaimer

The information in this leaflet is based on our knowledge and experience at the time of printing, as stated above. Therefore, please make sure that you always use the latest version hereof. The general description of product use in this leaflet cannot take into consideration special conditions and circumstances that may arise in individual cases. Therefore, please check our product in each case for its suitability for the specific application before use. The application use and processing of our product are naturally beyond our control. They are therefore exclusively the responsibility of the customer, as is the processing result achieved on the basis of our technical application information.

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