

PRODUCT DATA SHEET

King® MS-D1 UG

Accelerated, silica fume enhanced, pre-packaged, shotcrete material for dry-process applications



PRODUCT DESCRIPTION

King® MS-D1 UG is an accelerated, silica fume enhanced, pre-packaged, shotcrete material for dry-process applications. This product is a pre-blended, prepackaged, dry-process, shotcrete material containing Portland cement, silica fume, set-time accelerator, blended aggregates and other carefully selected components. It has greatly enhanced shooting characteristics providing reduced setting times and rapid strength development.

USES

- Ground support applications for mining, tunneling and other underground openings.
- Construction of underground bulkheads, backfill barricades, pillars, ventilation walls and other underground concrete structures.
- Use of a predampener in conjunction with dry-process accelerated shotcrete is not recommended. Contact your local SikaTechnical Representative for more information.

CHARACTERISTICS / ADVANTAGES

- Rapid early age strength development
- Improved performance in presence of running water
- Improved adhesive and cohesive plastic properties
- Significantly reduced rebound, resulting in lower material usage
- Superior ability to build greater thicknesses in a single pass in both vertical and overhead orientations
- Improved resistance to water wash-out
- Improved resistance to sulphate attack
- Low permeability
- Low shrinkage

OPTIONAL FEATURES & BENEFITS

SET TIME / STRENGTH GAIN

- King® MS-D1 UG contains a level 1 dosage of accelerator
- King® MS-D1 UG2 contains a level 2 dosage of accelerator
- King® MS-D1 UG3 contains a level 3 dosage of accelerator

GRADATION

- By default King® MS-D1 UG is blended to meet ACI 506 "Guide to Shotcrete", Table 1.1, Gradation No. 2
- King® MS-D1 UG G1 is blended to meet ACI 506 "Guide to Shotcrete", Table 1.1, Gradation No. 1

EXAMPLE:

For King® MS-D1 UG with Gradation No. 1, the name of the product would be King® MS-D1 UG G1

PRODUCT INFORMATION

Packaging	King® MS-D1 UG is normally packaged in 2,205 lb (1000 kg) bulk bags and polywrapped on wooden pallets. Material can also be supplied in 66 lb (30 kg) triple-lined bags. All KING products can be custom packaged to suit specific job requirements.				
Shelf Life	Unopened bags have a shelf life of 12 months.				
Storage Conditions	Material should be stored in a dry, covered area, protected from the elements. Physical properties of King® MS-D1 UG may be adversely affected if material is stored in temperatures below 32 °F (0 °C). Material stored below these temperatures should be allowed to warm to ambient underground temperatures before shooting.				
Compressive Strength		King® MS-D1 UG	King® MS-D1 UG2	King® MS-D1 UG3	ASTM C 116 (MODIFIED)
	4 hours	-	290 psi (2 MPa)	1015 psi (7 MPa)	
	8 hours	1015 psi (7 MPa)	1150 psi (8 MPa)	1450 psi (10 MPa)	
	12 hours	1450 psi (10 MPa)	1750 psi (12 MPa)	2030 psi (14 MPa)	
Compressive Strength		King® MS-D1 UG	King® MS-D1 UG2	King® MS-D1 UG3	ASTM C 1604
	1 day	2900 psi (20 MPa)	2900 psi (20 MPa)	2900 psi (20 MPa)	
	3 days	4060 psi (28 MPa)	4060 psi (28 MPa)	4060 psi (28 MPa)	
	7 days	4640 psi (32 MPa)	4640 psi (32 MPa)	4640 psi (32 MPa)	
	28 days	6000 psi (42 MPa)	6000 psi (42 MPa)	6000 psi (42 MPa)	
Flexural Strength	FLEXURAL STRENGTH			ASTM C 78	
	28 days	985 psi (6.8 MPa)			
Porosity	BOILED ABSORPTION			ASTM C 642	
	6.0%				
	MAXIMUM VOLUME OF PERMEABLE VOIDS			ASTM C 642	
	14.0%				
Coverage	2,205 lb (1,000 kg) bag contains approximately 16.5 ft ³ (0.45 m ³)				
Cure Time	Good curing conditions are beneficial to optimizing physical properties of King® MS-D1 UG. Although the high relative humidity commonly found in underground environments provides for good curing conditions, additional curing is often appropriate and should be performed in accordance with ACI 308 "Guide to Curing Concrete".				
Thinner		King® MS-D1 UG	King® MS-D1 UG2	King® MS-D1 UG3	ASTM C 1117
	Initial	20 minutes	10 minutes	5 minutes	
	Final	45 minutes	25 minutes	10 minutes	

BASIS OF PRODUCT DATA

Results may differ based upon statistical variations depending upon mixing methods and equipment, temperature, application methods, test methods, actual site conditions and curing conditions. The following data was obtained under controlled conditions with material and ambient temperatures of 70 °F (21 °C). Higher or lower temperatures can respectively accelerate or delay setting time and early-age compressive strength gain.

AVAILABILITY/WARRANTY

Each of the following descriptors / features have the possibility of being included in a specific mix design; Either on their own, or combined with any other descriptor / feature;
No accelerator (NX)

ENVIRONMENTAL, HEALTH AND SAFETY

For further information and advice regarding transportation, handling, storage and disposal of chemical products, user should refer to the actual Safety Data Sheets containing physical, environmental, toxicological and other safety related data. User must read the current actual Safety Data Sheets before using any products. In case of an emergency, call CHEMTREC at 1-800-424-9300, International 703-527-3887.

SURFACE PREPARATION

All surfaces to be in contact with King® MS-D1 UG must be free from dust, oil, grease or any other foreign substances that may interfere with the bond of the material. Remove all loose or delaminated rock. Clean the area with potable water, leaving the substrate saturated but free of standing water (SSD).

APPLICATION

Apply King® MS-D1 UG in accordance with the ACI 506 "Guide to Shotcrete" publication.

OPTIMUM PERFORMANCE

- King® MS-D1 UG should not be applied when ambient, substrate and material temperatures are below 40 °F (5 °C) .

- Performance of in-place shotcrete relies heavily upon application techniques. To ensure optimum quality of in-place shotcrete, the material, equipment and key personnel should be pre-qualified prior to project start-up.

CLEANING OF TOOLS

Clean all tools and equipment after use with water. Once hardened, the product can only be removed mechanically.

OTHER RESTRICTIONS

See Legal Disclaimer.

LEGAL DISCLAIMER

- KEEP CONTAINER TIGHTLY CLOSED
- KEEP OUT OF REACH OF CHILDREN
- NOT FOR INTERNAL CONSUMPTION
- FOR INDUSTRIAL USE ONLY
- FOR PROFESSIONAL USE ONLY

Prior to each use of any product of Sika Corporation, its subsidiaries or affiliates ("SIKA"), the user must always read and follow the warnings and instructions on the product's most current product label, Product Data Sheet and Safety Data Sheet which are available at usa.sika.com or by calling SIKA's Technical Service Department at 1-800-933-7452. Nothing contained in any SIKA literature or 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 product label, Product Data Sheet and Safety Data Sheet prior to use of the SIKA product.

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