

## MS-D3 MINING SHOTCRETE

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

MS-D3 Mining Shotcrete is a pre-blended, pre-packaged dry process shotcrete material containing high early Portland cement, silica fume, set time accelerator, blended aggregates and other carefully selected components. MS-D3 Mining Shotcrete has greatly enhanced shooting characteristics providing reduced setting times and rapid strength development.

### FEATURES & BENEFITS

- 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 washout.
- Improved resistance to sulphate attack.
- Low permeability.
- Low shrinkage.
- Blended to meet ACI 506 "Guide to Shotcrete", Table 1.1, Gradation No. 2.
- All King products are manufactured using ISO 9001:2000 Certified Processes.

### 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.

### PROCEDURES

#### Surface Preparation:

All surfaces to be in contact with MS-D3 Mining Shotcrete 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 MS-D3 Mining Shotcrete in accordance with the ACI 506 "Guide to Shotcrete" publication.

#### Curing:

Good curing conditions are beneficial to optimizing physical properties of MS-D3 Mining Shotcrete. 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".

### TECHNICAL DATA

The following data is representative of typical values achievable using proper application techniques as outlined in the ACI 506 "Guide to Shotcrete" publication. The data was obtained during project field tests and in-house shotcrete studies.

### COMPRESSIVE STRENGTH

#### ASTM C 1116 (ADAPTED)

8 Hr	7 MPa (1015 psi)
24 Hr	20 MPa (2900 psi)

#### ASTM C 1604

7 Day	35 MPa (5075 psi)
28 Day	45 MPa (6525 psi)

### FLEXURAL STRENGTH

#### ASTM C 78

28 Day	6.8 MPa (985 psi)
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### BOILED ABSORPTION

ASTM C 642	6.0 %
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### MAXIMUM VOLUME OF PERMEABLE VOIDS

ASTM C 642	14.0 %
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### OPTIMUM PERFORMANCE

- MS-D3 Mining Shotcrete should not be applied when ambient, substrate and material temperatures are below 5°C (40°F).
- 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.

### YIELD

- 1,000 kg (2,205 lb.) bag contains approximately 0.45 m<sup>3</sup> (16.5 ft<sup>3</sup>).

### PACKAGING

MS-D3 Mining Shotcrete is normally packaged in 1,000 kg (2,205 lb.) re-useable bulk bags and poly wrapped on wooden pallets. Material can also be supplied in 30 kg (66 lb.) triple lined bags. All KING products can be custom packaged to suit specific job requirements.

### STORAGE AND SHELF LIFE

Material should be stored in a dry covered area protected from the elements. Unopened bags have a shelf life of 12 months. Physical properties of MS-D3 Mining Shotcrete may be adversely affected if material is stored in temperatures below 0°C (32°F). Material stored below these temperatures should be allowed to warm to ambient underground temperatures before shooting.

### SAFETY PROCEDURES

MS-D3 Mining Shotcrete contains Portland cement. Normal safety-wear such as rubber gloves, dust mask and safety glasses used to handle conventional cement based products should be worn. Material Safety Data Sheets are available upon request.

**MS-D3 MINING SHOTCRETE**

This product is designed to meet the performance specifications outlined in this product data sheet. If the product is used in conditions for which it was not intended, or applied in a manner contrary to the written recommendations contained in the product data sheet, the product may not reach such performance specifications. The foregoing is in lieu of any other warranties, representations or conditions, expressed or implied, including, but not limited to, implied warranties or conditions of merchantable quality or fitness for particular purposes, and those arising by statute or otherwise in law or from a course of dealing or usage of trade.

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**KING PACKAGED MATERIALS COMPANY**

**Burlington Office**  
3385 Harvester Rd.  
Burlington, ON  
L7N 3N2

Phone: (905) 639-2993  
Fax: (905) 333-3730

**Blainville Office**  
650 Boul. Labelle  
Blainville, QC  
J7C 2J2

Phone: (450) 430-4104  
Fax: (450) 430-6855

**Brantford Office**  
541 Oak Park Rd.  
Brantford, ON  
N3T 5L8

Phone: (519) 756-6177  
Fax: (519) 756-7490

**Sudbury Office**  
644 Simmons Rd.  
Dowling, ON  
P0M 1R0

Phone: (705) 855-1155  
Fax: (705) 855-1122