

MS-D3 ACCELERATED SHOTCRETE

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

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

FEATURES & BENEFITS:

- Improved performance in cold temperatures.
- Improved performance in presence of running water.
- Allows for earlier re-opening of traffic lanes on bridges and in subway tunnels.
- Air-entrainment provides superior resistance to freeze-thaw cycling and salt scaling resistance.
- 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.
- Very low permeability.
- Low shrinkage.
- Can be blended to meet ACI 506 "Guide to Shotcrete", Table 2.1, Gradation #1 or #2.
- Pre-packaged under international quality standards of ISO 9001:2000.

USES:

- Rehabilitation of concrete bridges, dams, reservoirs, subway tunnels, marine structures and parking ramps.
- Lining and rehabilitation of sewers and watermain.
- New construction including slope stabilization, soil-nailing, shaft and tunnel lining.

PROCEDURES (for temperatures above 5°C):

Surface Preparation (Repair or Rehabilitation):

All surfaces to be in contact with **MS-D3 Accelerated 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 concrete providing a roughened surface and a minimum of 20 mm (3/4 inch) clearance behind the reinforcing steel. The perimeter of the repair area should be sawcut a minimum

of 20 mm (3/4 inch). Clean the area to be repaired with potable water, leaving the concrete saturated but free of standing water (SSD).

Application:

Apply **MS-D3 Accelerated Shotcrete** in accordance with the ACI 506 "Guide to Shotcrete" publication.

Curing:

Curing is essential to optimize physical properties of the shotcrete and minimize plastic shrinkage. **MS-D3 Accelerated Shotcrete** should be cured immediately after material has reached initial set in accordance with ACI 308 "Standard Practice for Curing Concrete". Continuously moist cure for a minimum period of 7 days. Alternatively, moist cure for a minimum period of 24 hours and apply a curing compound which complies with ASTM C 309. Curing is particularly critical in rapid moisture loss conditions such as high temperatures, high winds and low humidity.

PROCEDURES (for temperatures below 5°C / 40°F):

Surface Preparation (Repair or Rehabilitation):

All surfaces to be in contact with **MS-D3 Accelerated Shotcrete** must be free from oil, grease or any other foreign substances that may interfere with the bond of the material. Remove all loose or delaminated concrete providing a roughened surface and a minimum of 25 mm (1 inch) clearance behind the reinforcing steel. The perimeter of the repair area should be sawcut a minimum of 20 mm (3/4 inch).

To avoid freezing of the interface between the shotcrete and the parent concrete, do not pre-wet the receiving surface. Pneumatically remove any free standing or other fine particles that may interfere with the bond between the **MS-D3 Accelerated Shotcrete** and the substrate.

Do not apply **MS-D3 Accelerated Shotcrete** when ambient temperature is below or is expected to fall below -5°C (20°F) within 6 hours following the application of shotcrete. Do not apply when temperature of receiving surface is below -5°C (20°F).

Material temperature should be maintained above 10°C (50°F) at time of application. Mixing water temperature should be maintained between 20° – 25°C (70° – 80°F).

Application:

Apply **MS-D3 Accelerated Shotcrete** in accordance with the ACI 506 "Guide to Shotcrete" publication.

Mixing Strength With Satisfaction

KING PACKAGED MATERIALS COMPANY
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PHONE: 800-461-0566
FAX: 905-333-3730
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WEBSITE: www.kingshotcrete.com

Curing:

A resin based liquid membrane curing compound approved for use in cold weather conditions should be applied immediately after shotcrete reaches final set.

TECHNICAL DATA:

The following data is representative of typical values achievable using proper application techniques as outlined in 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)

4 Hr	7 MPa (1015 psi)
8 Hr	15 MPa (2175 psi)
12 Hr	19 MPa (2755 psi)
24 Hr	25 MPa (3625 psi)

ASTM C 42

28 Day	42 MPa (6000 psi)
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Flexural Strength

ASTM C 78

28 Day	6.5 MPa (940 psi)
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Air Content

ASTM C 457	6 (+/- 2%)
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Maximum Air Void Spacing Factor

ASTM C 457	300 µm
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Freeze-Thaw Resistance

ASTM C 666	96%
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Salt Scaling Resistance

ASTM C 672	1.2 kg/m ² (0.24 lb./ft ²)
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Uniaxial Drying Shrinkage

ASTM C 157	1200 µm/m
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Boiled Absorption

ASTM C 642	6.0%
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Maximum Volume of Permeable Voids

ASTM C 642	15.0%
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Rapid Chloride Permeability

ASTM C 1202	700 coulombs
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OPTIMUM PERFORMANCE:

- **MS-D3 Accelerated Shotcrete** should not be applied when ambient, substrate and material temperatures are below -5°C (20°F) or above 35°C (95°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.
- Material should be stored in a dry covered area protected from the elements.

YIELD:

- 30 kg (66 lb.) bag contains approximately 0.014 m³ (0.5 ft³).
- 1,000 kg (2,205 lb.) bag contains approximately 0.45 m³ (16.5 ft³).

PACKAGING:

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

SHELF LIFE:

Unopened bags have a shelf life of 12 months when stored as recommended.

SAFETY PROCEDURES:

MS-D3 Accelerated 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.

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.