

PRODUCT DATA SHEET

King® MS-W1

SHOTCRETE MATERIAL FOR WET-MIX PROCESS APPLICATIONS



PRODUCT DESCRIPTION

King® MS-W1 is a pre-blended and pre-packaged shotcrete material formulated for wet-mix process applications. It contains Portland cement, silica fume, blended aggregates, along with other carefully selected components. It has greatly enhanced shooting characteristics and physical properties.

USES

- Rehabilitation of concrete bridges, dams, reservoirs, tunnels, and parking ramps
- Lining and rehabilitation of sewers and water mains
- New construction including slope stabilization, soil-nailing, shaft and tunnel linings, pools and other concrete structures

CHARACTERISTICS / ADVANTAGES

- Air-entrainment provides superior resistance to freeze-thaw cycling and salt-scaling resistance
- Improved pumpability and shootability
- Improved adhesive and cohesive plastic properties
- Significantly reduced rebound and low dust levels, resulting in lower material usage
- Improved ability to build greater thicknesses in a single pass in both vertical and overhead orientations
- Improved resistance to water wash-out and to sulphate attack
- Very low permeability and low shrinkage
- Compatible with integral, pre-applied and/or post-applied corrosion inhibitors
- Designed with natural normal-density non-reactive aggregates to eliminate potential alkali-aggregate reactivity (AAR)

OPTIONAL FEATURES & BENEFITS

Set-time / Strength Gain

Liquid accelerator can be added at the nozzle to reduce set time and increase early age strength gain.

Contact your Sika STM Technical Representative for more information.

Micro-Synthetic Fiber (SY)

- Micro-Synthetic fibers reduce cracking caused by intrinsic stresses
- Type III synthetic fiber in accordance with ASTM C1116
- Grade FR Class I shotcrete in accordance with ASTM C1480

Corrosion Inhibitor (CI)

- Corrosion inhibitor protects steel reinforcing and other metals embedded in concrete from corrosion induced by carbonation or chlorides
- Pre-blended corrosion inhibitor provides the correct dosage to enhance corrosion protection

Gradation (G2)

- By default King® MS-W1 is blended to meet ACI 506 "Guide to Shotcrete", Table 1.1, Gradation No. 1 (No Added Abbreviation)
- King® MS-W1 G2 is blended to meet ACI 506 "Guide to Shotcrete", Table 1.1, Gradation No. 2. (G2)

EXAMPLE:

For King® MS-W1 with micro-synthetic fibers and gradation No. 2, the name of this product would be: **King® MS-W1 SY G2.**

PRODUCT INFORMATION

Packaging	66 lb (30 kg) bag 2205 lb (1000 kg) FIBC* Products containing Macro-Synthetic fibers (MF) or Steel fibers (ST) can only be packaged in FIBC* Custom packaging is available to suit specific project requirements <small>*Flexible Intermediate Bulk Container</small>
Shelf Life	12 months in original, unopened packaging
Storage Conditions	Stored in a dry, covered area, protected from the elements between 40°F - 95°F (5°C - 35°C) Underground Environments Stored in a dry, covered area, protected from the elements between 40°F - 95°F (5°C - 35°C) Physical properties may be adversely affected if material is stored in temperatures below 40°F (5°C) and should be allowed to warm to ambient underground temperatures before application

TECHNICAL INFORMATION

Compressive Strength		ASTM C1604
	1 Day	2175 psi (15 MPa)
	3 Days	4060 psi (28 MPa)
	7 Days	4640 psi (32 MPa)
	28 Days	6000 psi (42 MPa)
Flexural Strength		ASTM C78
	28 Days	940 psi (6.5 MPa)
Splitting tensile strength		ASTM C496
	7 Days	650 psi (4.5 MPa)
	28 Days	840 psi (5.8 MPa)
Shrinkage	UNIAXIAL DRYING SHRINKAGE 0.065 %	ASTM C157
Rapid Chloride Permeability	CHLORIDE ION PENETRABILITY 700 Coulombs	ASTM C1202
Porosity	AIR CONTENT 6% ± 2%	ASTM C457
	BOILED ABSORPTION 6.0%	ASTM C642
	MAXIMUM AIR VOID SPACING FACTOR 0.009 in (230 µm)	ASTM C457
	MAXIMUM VOLUME OF PERMEABLE VOIDS 15.0%	ASTM C642
	Freeze-Thaw Stability	100% (Excellent durability factor)
Salt resistance	SALT-SCALING RESISTANCE 0.04 lb/ft ² (0.2 kg/m ²)	ASTM C672
Coverage	Approx. 0.5 ft ³ per 66 lb bag (0.014 m ³ per 30 kg bag) Approx. 16.5 ft ³ per 2205 lb FIBC (0.45m ³ per 1000 kg FIBC)	

Initial	4 Hours
Final	6 Hours

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 descriptors / features.

Descriptors / Features of fiber dosages:

Micro-Synthetic Fibers	SY
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Descriptors / Features of other technologies:

Corrosion Inhibitor	CI
Anti-Microbial	AM
Crystalline Waterproofing	CW
Not Air Entrained	NE
Gradation 2	G2

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

- **Rock Surfaces:** All surfaces to be in contact with King® MS-W1 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).
- **Repair or Rehabilitation:** All surfaces to be in contact with King® MS-W1 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 ¾ inch (20 mm) clearance behind any corroded reinforcing steel. The perimeter of the repair area should be saw-cut a minimum of ¾ inch (20 mm). Clean the area to be repaired with potable water, leaving the concrete saturated but free of standing water (SSD).

MIXING

Place 75% of required water into mixer and slowly introduce entire bag of King® MS-W1 while the mixer is running. Allow King® MS-W1 to mix for a minimum of five minutes. Slowly add balance of required water until desired slump has been obtained, not exceeding maximum recommended volume of water.

Maximum recommended volume of water is 0.9 US gallon per 66 lb bag (3.4 L per 30 kg bag). Continue mixing and stop only after material has reached a consistent, homogeneous mix.

APPLICATION

Apply King® MS-W1 in accordance with the ACI 506 “Guide to Shotcrete” publication.

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

OPTIMUM PERFORMANCE

- King® MS-W1 should not be applied when ambient, substrate and material temperatures are below 40 °F (5 °C) or above 95 °F (35 °C).
- For adverse temperatures, follow ACI recommendations for Cold / Hot Weather Concreting.

Contact your Sika STM Technical Representative for more information.

CURING TREATMENT

Curing is essential to optimize physical properties of the shotcrete and minimize plastic shrinkage. King® MS-W1 should be cured immediately after material has reached initial set in accordance with ACI 308 “Guide to 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 that complies with ASTM C309. Curing is particularly critical in rapid moisture loss conditions such as high temperatures, high winds and low humidity.

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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Product Data Sheet

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