

PRODUCT DATA SHEET

King® MS-W1 US

SHOTCRETE MATERIAL FOR WET-MIX PROCESS APPLICATIONS

PRODUCT DESCRIPTION

King® MS-W1 US is a pre-blended and prepackaged 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 watermain
- 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 sulfate attack
- Very low permeability and low shrinkage
- Compatible with integral, pre-applied and/or postapplied 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 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 US is blended to meet ACI 506 "Guide to Shotcrete", Table 1.1, Gradation No. 1 (No Added Abbreviation)
- King® MS-W1 G2 US is blended to meet ACI 506 "Guide to Shotcrete", Table 1.1, Gradation No. 2. (G2)

EXAMPLE:

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

PRODUCT INFORMATION

Packaging	65 lb (29.5 kg) bag 2200 lb (997 kg) bulk bag
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)
Shrinkage		ASTM C157
	28 days	0.065%
Freeze-Thaw Stability		ASTM C666
	28 days	100% (Excellent durability factor)
Porosity		ASTM C457
	Air Content	6 ± 2%
		ASTM C642
	Boiled Absorption	6%
		ASTM C457
	Max Air-Void Spacing Factor	0.009 in (230 µm)
		ASTM C642
	Max Volume of Permeable Voids	15.0%
Salt resistance		ASTM C672
	Salt Scaling Resistance	0.04 lb/ft ² (0.2 kg/m ²)
Rapid Chloride Permeability		ASTM C1202
	28 days	700 Coulombs

APPLICATION INFORMATION

Coverage	Approx. 0.5 cf per 65 lb bag (0.014 m ³ per 29.5 kg bag) Approx. 16.5 cf per 2200 lb bag (0.45 m ³ per 997 kg bag)
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Initial	4 hrs
Final	6 hrs

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.

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
Non Air-Entrained	NE
Gradation 2	G2

SURFACE PREPARATION

- **Rock Surfaces:** All surfaces to be in contact with King® MS-W1 US 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 US 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 US while the mixer is running. Allow King® MS-W1 US 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 65 lb bag (3.4 L per 39.5 kg bag). Continue mixing and stop only after material has reached a consistent,

homogeneous mix.

APPLICATION

Apply King® MS-W1 US 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 US 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 Representative for more information.

CURING TREATMENT

Curing is essential to optimize physical properties of the shotcrete and to minimize cracking as a result of plastic and drying shrinkage. King® MS-W1 US 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 or ASTM C1315. Curing is particularly critical in rapid moisture loss conditions such as high temperatures, high winds and low humidity. An evaporation retarder such as SikaFilm® or Sikagard® 30 ER is recommended in these conditions.

CLEANING OF TOOLS

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

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

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Sika warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Product Data Sheet if used as directed within the product's shelf life. User determines suitability of product for intended use and assumes all risks. User's and/or buyer's sole remedy shall be limited to the purchase price or replacement of this product exclusive of any labor costs.

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Product Data Sheet

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