

PRODUCT DATA SHEET

King® ArmourGuard

HIGH ABRASION RESISTANCE SHOTCRETE MATERIAL FOR DRY-MIX PROCESS APPLICATIONS



PRODUCT DESCRIPTION

King® ArmourGuard is a pre-blended and pre-packaged shotcrete material for dry-mix process applications, specially formulated with high-performance steel fiber-reinforced shotcrete mix design to provide superior impact and abrasion resistant characteristics. It contains high early Portland cement, silica fume, steel fiber, blended aggregates, set time accelerators, and other carefully selected components. It is designed to produce superior impact and abrasion resistant characteristics.

USES

- Ore pass linings
- Ore pass brows
- Truck dumps
- Ore and rock chutes
- Other areas of high impact and abrasion

CHARACTERISTICS / ADVANTAGES

- Superior impact and abrasion resistant characteristics
- Significantly increased load carrying capacity
- Significantly increased energy absorbing capacity (toughness)
- Rapid early-age strength development
- Low permeability
- Can be poured in-place as a conventional concrete mix

APPROVALS / STANDARDS

- By default King® ArmourGuard is blended to meet ACI 506 "Guide to Shotcrete", Table 1.1, Gradation No. 2 (No Added Abbreviation)
- Conform to ASTM C1116 / C1116M, Type 1 Steel fiber reinforced concrete
- Conforms to ASTM A820 / A 820M-04, Type 1 cold drawn wire

PRODUCT INFORMATION

Packaging	2205 lb (1000 kg) FIBC* Custom packaging is available to suit specific job requirements. *Flexible Intermediate Bulk Container
Shelf Life	12 months in original, unopened packaging
Storage Conditions	Store in a dry, covered area, protected from the elements For optimum performance it is recommended to store the material between 32°F - 95°F (5°C - 35°C) Underground Environments Physical properties may be adversely affected if material is stored in temperatures below 32°F (0°C) and should be allowed to warm to ambient underground temperatures before application

TECHNICAL INFORMATION

Abrasion Resistance	PROCEDURE - C		ASTM C779			
		Rate of Wear				
	7 Days	6.7 x 10 ⁻³ in/min (170 µm/min)				
	28 Days	4.7 x 10 ⁻³ in/min (120 µm/min)				
	LASA MODIFIED TUMBLING		Volume of Material Lost			
	24 Hours	12.2 in ³ (0.20 L)				
	48 Hours	20.7 in ³ (0.34 L)				
Compressive Strength			ASTM C116 (MODIFIED)			
	4 hours	290 psi (2 MPa)				
	8 hours	1150 psi (8 MPa)				
	12 hours	1750 psi (12 MPa)				
			ASTM C1604			
	1 day	3625 psi (25 MPa)				
	7 days	5800 psi (40 MPa)				
	28 days	8700 psi (60 MPa)				
	Flexural toughness			ASTM C1550		
		Peak applied load	Toughness as a function of flexure			
5 mm			10 mm	20 mm	30 mm	40 mm
8992 lbf (40 kN)		> 100 J	> 215 J	> 350 J	> 450 J	> 500 J
		ASTM C 1609				
FLEXURAL PERFORMANCE						
First peak strength		F₆₀₀¹⁰⁰	F₁₅₀¹⁰⁰			
905 psi (6.26 MPa)		797 psi (5.5 MPa)	652 psi (4.5 MPa)			

Coverage

Approx. 16.5 ft³ per 2205 lb FIBC (0.43 m³ per 1000 kg FIBC)

*May vary according to projects conditions

Substrate Temperature

King® ArmourGuard should not be applied when ambient, substrate and material temperatures are below 32 °F (0 °C)

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 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.

The data in this data sheet 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.

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.

APPLICATION INSTRUCTIONS

EQUIPMENT

Special precautions needed when using predampeners with dry blended powdered accelerated shotcrete.

Contact your Sika STM Technical Representative for more information.

SURFACE PREPARATION

- **Rock surfaces:** All surfaces to be in contact with King® ArmourGuard 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® ArmourGuard in accordance with the ACI 506 "Guide to Shotcrete" publication. If placing as conventional concrete, note that mix is not pumpable.

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

- ArmourGuard should not be applied when ambient, substrate and material temperatures are below 32 °F (0 °C).
- Recommended minimum inside diameter of shotcrete hoses should be 2 inches (50 mm).

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. Product 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 seven (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.

Underground Environments

Good curing conditions are beneficial to optimizing physical properties. 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".

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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

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