

PRODUCT DATA SHEET

King[®] ArmourGuard

HIGH ABRASION RESISTANCE SHOTCRETE MATERIAL FOR DRY-MIX PROCESS APPLICATIONS

PRODUCT DESCRIPTION

King[®] ArmourGuard is a specially formulated, high-performance, steel fiber-reinforced shotcrete mix designed to provide superior impact and abrasion resistant characteristics. This product is a pre-blended, pre-packaged, dry-process shotcrete material containing 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

WHERE TO USE

- Ore pass linings
- Ore pass brows
- Truck dumps
- Ore and rock chutes
- Other areas of high impact and abrasion
- Use of a predampener in conjunction with dry-process accelerated shotcrete is not recommended. Contact your Sika STM Technical Support Staff for more information.

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 / CERTIFICATES

Blended to meet ACI 506 "Guide to Shotcrete", Table 1.1, Gradation No. 2
Conform to ASTM C 1116/C 1116M, Type 1 Steel fiber reinforced concrete
Conforms to ASTM A820 /A 820M - 04, Type I cold drawn wire

PRODUCT INFORMATION

Packaging

- 1,000 KG (2,205 lb) FIBC

*custom packaging is available to suit specific job requirements.

Shelf Life

12 months in original, unopened packaging

Storage Conditions

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 King[®] ArmourGuard 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.

TECHNICAL INFORMATION

Abrasion Resistance	PROCEDURE C		ASTM C 779		
	7 Days	170 µm/min (6.7 x 10 ⁻³ in/min)			
	28 Days	120 µm/min (4.7 x 10 ⁻³ in/min)			
	(Rate of wear)				
	LASA MODIFIED TUMBLING				
24 Hours	0.20 L (12.2 in ³)				
48 Hours	0.34 L (20.7 in ³)				
		(volume of material lost)			
Compressive Strength	4 Hours	2 MPa (290 psi)	ASTM C 116		
	8 Hours	8 MPa (1150 psi)	(ADAPTED)		
	12 Hours	12 MPa (1750 psi)			
	1 Day	25 MPa (3625 psi)	ASTM C 1604		
	7 Days	40 MPa (5800psi)			
	28 Days	60 MPa (8700psi)			
Flexural rigidity	ASTM C 1550				
	Peak applied load				
		Toughness as a function of flexure			
40 kN	5 mm	10 mm	20 mm	30 mm	40 mm
(8992 lbf)	>100J	>215J	>350J	>450J	>500J
FLEXURAL PERFORMANCE					
First peak strength	F¹⁰⁰₆₀₀	F¹⁰⁰₁₅₀		ASTM C 1609	
6.25 MPa	5.50 MPa	4.50 MPa			
(905 psi)	(797 psi)	(652 psi)			
Yield	Approx. 0.45 m ³ (16.5 ft ³) / 1,000 KG (2,205 lb) bag				
Substrate Temperature	King® ArmourGuard should not be applied when ambient, substrate and material temperatures are below 0 °C (32 °F)				
Curing Time	Good curing conditions are beneficial to optimizing physical properties of King® ArmourGuard. 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".				

BASIS OF PRODUCT DATA

All technical data stated in this Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

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.

LIMITATIONS

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.

ENVIRONMENT, HEALTH & SAFETY

User must read the most recent corresponding Safety Data Sheets (SDS) before using any products. The SDS provides information and advice on the safe handling, storage and disposal of chemical products and contains physical, ecological, toxicological and other safety-related data.

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).

CONCRETE 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. Clean the area to be repaired with potable water, leaving the concrete 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.

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

APPLICATION METHOD / TOOLS

Recommended minimum inside diameter of shotcrete hoses should be 50 mm (2 inches). 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.

CLEAN UP

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

LOCAL RESTRICTIONS

Note that as a result of specific local regulations the declared data and recommended uses for this product may vary from country to country. Consult the local Product Data Sheet for exact product data and uses.

LEGAL NOTES

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

PRODUCT DATA SHEET

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