

PRODUCT DATA SHEET

King[®] RS ArmourGuard

RAPID STRENGTH HIGH ABRASION RESISTANCE SHOTCRETE MATERIAL FOR DRY-MIX PROCESS APPLICATIONS

PRODUCT DESCRIPTION

King[®] RS ArmourGuard is a pre-blended and pre-packaged dry-mix process shotcrete material powered by Rapid Set[®] technology. It contains steel fibers, blended aggregates, and other carefully selected components. It is designed to produce superior impact and abrasion resistant characteristics, greatly reduced setting times and very rapid strength development.

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 resistance characteristics
- Significantly increased load carrying capacity
- Significantly increased energy absorbing capacity (toughness)
- Very rapid early age strength development
- Significantly reduced rebound, resulting in lower material usage
- Low shrinkage
- Blended to meet ACI 506 "Guide to Shotcrete", Table 1.1, Gradation No. 2

PRODUCT INFORMATION

| | |
|---------------------------|---|
| Packaging | 2205 lb (1000 kg) FIBC* Custom packaging is available to suit specific job requirements. <small>*Flexible Intermediate Bulk Container</small> |
| 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 40°F - 95°F (5°C - 35°C) |

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) |
| | 2 hours | | | | | 3000 psi (21 MPa) |
| | | | | | | ASTM C1604 |
| | 1 day | | | | | 6500 psi (45 MPa) |
| | 7 day | | | | | 7250 psi (50 MPa) |
| | 28 day | | | | | 8000 psi (55 MPa) |
| | Flexural toughness | | | | | |
| 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 |
| Coverage | | Approx. 16.5 ft ³ per 2205 lb FIBC (0.45 m ³ per 1000 kg FIBC) | | | | |
| | | *May vary according to projects conditions | | | | |

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® RS 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® RS 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

- Material should be allowed to warm to at least 60 °F (15 °C) prior to shooting in order to optimize early-age compressive strength results.
- 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".

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.

Sika Corporation

201 Polito Avenue
Lyndhurst, NJ 07071
Phone: +1-800-933-7452
Fax: +1-201-933-6225
usa.sika.com



Product Data Sheet
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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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