

## PRODUCT DATA SHEET

# Sikacrete<sup>®</sup>-213 F

Wet sprayed fire protection mortar

### PRODUCT DESCRIPTION

Cement-based pre-bagged, dry mix, fire protection mortar for wet sprayed application especially for concrete structures in tunnel construction as a fire barrier.

### USES

Sikacrete<sup>®</sup>-213 F is used for concrete and reinforced concrete structures exposed to fire hazards. It contains phyllosilicate aggregates, which are highly effective in resisting the heat of hydrocarbon fires. The thickness of the fire protection layer to be applied depends on the specified fire resistance. The outstanding properties of Sikacrete<sup>®</sup>-213 F allow greatly reduced thickness of the fire protection layer required.

### CHARACTERISTICS / ADVANTAGES

- Pre-bagged dry mortar mix for application by the wet spray process
- Minimal layer thickness to meet specifications
- Easy to apply
- Does not contribute to the formation of smoke or toxic fumes in fire
- Light weight, low density
- The sprayed mortar surface can be finished by trowel or wood float
- > 240 minutes fire resistance achievable
- Minimal rebound

### APPROVALS / STANDARDS

4 hour fire resistance over SikaWrap<sup>®</sup> and CarboDur FRP composites

- UL File BXUV.N856 and ULC File BXUVC.N813 - beam strengthened with CarborDur plates and SikaWrap<sup>®</sup> 103C/230C fabrics
- UL File BXUV.N857 and ULC File BXUVC.N814 - beam strengthened with SikaWrap<sup>®</sup> 103C/100G/A30G fabrics
- UL File BXUV.X855 and ULC File BXUVC.X826 - Column strengthened with SikaWrap<sup>®</sup> 103C fabric
- Independently assessed by UL (ULC) to CAN/ULC-S101, Standard Methods of Fire Endurance
- Tests of Building Construction Materials; and ASTM E-119 (NFPA 251) Standard
- Test Methods of Fire Tests of Building Construction and Materials
- Fire-resistance ratings tested in accordance with ANSI/UL 263

## PRODUCT INFORMATION

|                    |  |
|--------------------|--|
| Packaging          | 26.5 lb (12 kg) bag  |
| Appearance / Color | Gray powder  |
| Shelf Life         | 12 months from date of production if stored properly in original, unopened and undamaged sealed packaging. |
| Storage Conditions | Store dry at 40–95 °F (4–35 °C)<br>Protect from moisture. If damp, discard material                        |
| Density            | 73 lb/ft <sup>3</sup> (1.17 kg/L) (Fresh applied sprayed)  |

## TECHNICAL INFORMATION

|                                      |  |
|--------------------------------------|--|
| Compressive Strength                 | 290 psi (2.0 MPa)  |
| Freeze Thaw De-icing Salt Resistance | In order to guarantee resistance to frost, freeze thaw cycles and de-icing salts, the Salt Resistance surface of the mortar must be treated with Sikagard®-Wallcoat T. |
| Thermal Conductivity                 | 0.23 W/mK at 10 °C   |

## APPLICATION INFORMATION

|                         |  |
|-------------------------|--|
| Mixing Ratio            | 2.6-3.4 gal (10–13 L) per bag  |
| Coverage                | 6 ft <sup>2</sup> at 1.5" (0.56 m <sup>2</sup> at 38 mm) per bag<br>(Coverage figures do not include allowance for surface profile and porosity or material waste) |
| Layer Thickness         | Max. 1.5" (38 mm)<br>Wire mesh reinforcement required when applied in thicknesses greater than 1.5" (38 mm) and for overhead applications.                         |
| Ambient Air Temperature | 41–95 °F (5–35 °C)   |
| Substrate Temperature   | 41–95 °F (5–35 °C)   |

## APPLICATION INSTRUCTIONS

### SURFACE PREPARATION

#### Concrete

- Concrete substrate must be clean and sound.
- Remove any existing coatings, oil, grease, dirt, dust, curing agents, impregnations, wax, laitance, coatings and bond-inhibiting materials from the surface by appropriate means, including high-pressure water (> 11,000 psi).
- The substrate must be thoroughly pre-dampened to a saturated, surface dry (SSD) condition to prevent water loss and incomplete cement hydration when the mortar is placed.

#### Steel

- Steel substrates must be clean, dry and stable.
- Remove all existing treatments, such as coatings, sealers, wax and other contaminants such as rust, dirt, grease, oils and foreign matter.
- A steel primer is recommended.

### FRP Composites

- Composite materials, such as carbon and glass fiber reinforced polymers must be cured, clean, dry and stable.
- Remove all carbon dust from the surface.
- If the epoxy resin has blushed, this must be cleaned prior to installing Sikacrete®-213 F. Prime the FRP composite surface with Sikadur® 300 or Sikadur® 330 epoxy.
- Broadcast binding aggregate into the wet prime coat to adhere the Sikacrete®-213 F fire resistant mortar.

### MIXING

- Pour 2.6 gal. (10 L) of potable water into a suitably sized and clean mixing container.
- Add a bag of powder while slowly mechanically mixing, using a low speed drill (300 – 450 rpm) with a mud mixer or other suitable
- paddle.
- Mix to a uniform consistency for a minimum of 3 minutes.

- Mixing can also be done in a mortar mixer setup for a direct feed in to wet shotcreting equipment, maintaining the same mixing requirements as when mixing with a drill.
- Once mixed, if a wetter consistency is required, increase the water content up to a maximum of 3.4 gal.(13 L).
- Do not overwater as excessive water will cause severe bleeding, retardation and will reduce the strength and performance of the mortar.
- Extending (“bulking”) the mortar with additional aggregate or adding any other material into the mix is not permitted as this may impact the fire resistance of the mortar.

### APPLICATION

- At the time of application, the concrete substrate must be SSD (Saturated Surface Dry) with no surface water visible.
- FRP Composite and steel surfaces should be dry and clean.
- Resin surfaces must have an acceptable contact surface to which the mortar will adhere.
- Sikacrete®-213 F is applied by the wet-spray, dense stream or wet-spray, thin stream method (for vertical/overhead surfaces).
- Application equipment should include wet-spray, screw pump systems such as an Aliva® rotor system, Putzmeister®, Bunker® spray concrete system or similar.
- Where there is a risk of vibration or mechanical damage to the surface exists and for overhead applications, the use of a light wire mesh reinforcement is recommended in order to prevent any debonding of the mortar layer.
- Position spray nozzle 18 – 24" (450 – 600 mm) perpendicular to the surface. This will minimize rebound, create a smoother finished surface and will flatten out when applied at the proper pressure.
- The surface of the freshly applied mortar can be finished for up to one hour after application dependent on the temperature and humidity.
- When application requires an aesthetic or protective coating, contact Sika’s Technical Services for guidance.

### CURING TREATMENT

- As per ACI 308 recommendations for Portland cement concrete, curing is required.
- Moist cure with wet burlap and polyethylene, a fine mist of water or a water based\* compatible curing compound.
- Curing compounds adversely affect the adhesion of following lifts of mortar, leveling mortar or protective coatings.
- Moist curing should commence immediately after finishing.
- Protect freshly applied mortar from direct sunlight, wind, rain and frost.

\* Pretesting of curing compound is recommended.

## CLEANING OF TOOLS

Clean all tools and application equipment with water immediately after use. Hardened / cured material can only be removed mechanically.

## LIMITATIONS

- For optimum resistance to mechanical wear, additional sealing of the surface with Sikagard®-Wallcoat T is recommended.
- To achieve the optimum physical characteristics, the spray nozzle must be handled by a trained and experienced operator.
- Sikacrete®-213 F must not assume any load-bearing function.
- Sikacrete®-213 F is a sacrificial layer and must be replaced in the event of a fire.
- Sikacrete®-213 F must not be exposed to weathering (frost, freeze/thaw, moisture) without additional protection.

## 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.

## OTHER RESTRICTIONS

See Legal Disclaimer.

## 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.

## DIRECTIVE 2004/42/CE - LIMITATION OF EMISSIONS OF VOC

0 g/l

(EPA method 24)

## 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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### Product Data Sheet

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