BUILDING TRUST

PRODUCT DATA SHEET

# Sikacrete®-213 F

Wet sprayed, vermiculite-based fire protection mortar

AVAILABLE ON INDENT ORDER ONLY

## DESCRIPTION

Sikacrete®-213 F is a 1-part, cementitious, fire protection mortar for wet spray application. Suitable for fire protecting all types of reinforced concrete buildings and civil engineering structures including tunnels. It contains phyllosilicate aggregates, which are highly effective in resisting the heat of hydrocarbon fires. The fire protection performance allows a reduced thickness of fire protection required compared to concrete. The fire protection layer thickness depends on the specified fire resistance.

## USES

- Fire protection of concrete and reinforced concrete structures exposed to fire risk, e.g. tunnels
- Fire protection of concrete member reinforced with FRP (Sika® Carbodur® & SikaWrap®)
- Factory made lightweight rendering and plastering mortar (LW) intended for interior and exterior use in walls, ceilings, columns and partitions as per EN 998-1:2016

## CHARACTERISTICS / ADVANTAGES

- Pre-bagged dry mortar mix
- Application by the wet spray process with minimal rebound
- Easy surface finishing by trowel or wood float
- Minimal layer thickness to comply with fire regulations
- Does not contribute to the formation of smoke or toxic fumes during a fire
- > 240 minutes fire resistance achievable
- Monolithic, joint-free layer
- Light weight, low density and breathable system
- High thermal and acoustic insulation
- Easy to maintain and repair

## ENVIRONMENTAL INFORMATION

- VOC emission classification GEV-EMICODE® EC1 plus
- Attestation LEED v4 and v4.1 BETA

## APPROVALS / STANDARDS

- 3 hours fire testing to EN 1363-1 (RWS curve), VSH, Report No. 20200010
- 4 hours fire testing, Lachenbrand curve, VSH, Report No. 20090011
- 4 hours fire resistance testing over SikaWrap® and CarboDur®, NRC, Reports No. B4247.1 & B4247.2
- Fire resistance RABT-ZTV (train) fire curve, ENALOS
- CE Marking and Declaration of Performance according to EN 998-1 — Factory made lightweight rendering and plastering mortar (LW) intended for interior and exterior use in walls, ceilings, columns and partitions
- Fire resistance ratings - BXUV - ANSI/UL 263 certified for United States & BXUV7 - CAN/ULC-S101 Certified for Canada, January 2020:
  - BXUV.N856 — beam strengthendd with Sika CarboDur® plates and SikaWrap® fabrics
  - BXUV.N857 — beam strengthened with SikaWrap® fabrics
  - BXUV.X855 — column strengthened with SikaWrap® fabrics

## PRODUCT INFORMATION

| | |
|---|---|
| **Chemical Base** | Portland cement, additives and phyllosilicate aggregates |
| **Packaging** | 8 kg bag |
| **Appearance / Colour** | Grey powder |
| **Shelf Life** | 12 months from date of production if stored properly in undamaged un-opened, original sealed packaging. |
| **Storage Conditions** | The product must be stored in original, unopened and undamaged pack-aging in dry conditions at temperatures between +5 °C and +30 °C. Always refer to packaging. |
| **Density** | Powder ~0,5 kg/L<br>Freshly applied ~1,0 kg/L (sprayed)<br>After 28 days curing ~0,6 kg/L (sprayed) |
| **Maximum Grain Size** | ~3 mm |

## TECHNICAL INFORMATION

| | | |
|---|---|---|
| **Compressive Strength** | ≥ 1.0 N/mm² after 28 days (Class CS I)<br>Tests conducted with spray-applied mortar. | (EN 1015-12) |
| **Tensile Adhesion Strength** | ≥ 0.15 MPa (after 28 days)<br>Tests conducted with spray-applied mortar and Sika MonoTop®-1010 as bonding slurry. | (EN 1015-12) |
| **Reaction to Fire** | Class A1 | (EN 13501-1) |
| **Diffusion Resistance to Water Vapour** | μ ≤ 6.0 | (EN 1015-19) |
| **Thermal Conductivity** | $\lambda_{10,dry,mat}$ ≈ 0.12 W/m·K (tab. mean value, P=50%) | (EN 1745:2012) |
| **Water Absorption** | Class $W_c0$ | (EN 1015-18) |

## APPLICATION INFORMATION

| | |
|---|---|
| **Mixing Ratio** | 7.1 - 9.8 L of water per 8 kg bag |
| **Consumption** | ~4.5 – 5.5 kg powder per m² at 10 mm thickness<br>This figure is theoretical and does not include any additional material due to surface porosity, surface profile, variations in level or wastage etc. |
| **Layer Thickness** | 10 to 40 mm (per layer) |
| **Ambient Air Temperature** | +5 °C min. / +30 °C max. |
| **Substrate Temperature** | +5 °C min. / +30 °C max. |

## SYSTEM INFORMATION

**System Structure**

**Bonding Primer**

- Sika MonoTop®-910 N

**Reinforcement**

| Structure | Reinforcement type |
|---|---|
| Tunnels* | Galvanised or stainless steel. |
| Other structures | According to the application thickness** |

* A light mesh is always recommended in order to prevent debonding of the mortar layer.
** Contact Sika Technical Services for more information.

**Fire Protection Mortar**

- Sikacrete®-213 F, application thickness depends on the specified fire resistance

**Surface Protection**

| Structure | Exposure | Protective coatings (examples**) |
|---|---|---|
| Tunnels and other structures | Internal and normal exposure | No coating required |
| Tunnels | Exposure to freeze thaw cycles, de-icing salt.<br>Improved resistance to mechanical wear (with pore sealer). | Sikagard®-340 WCT<br>Sikagard®-260 WPU |
| Other structures | Exposure to $CO_2$, freeze thaw cycles, de-icing salt.<br>Improved resistance to mechanical wear (with pore sealer).<br>Aesthetic colour finish. | Hydrophobic Impregnation:Sikagard®-706 Thixo<br>Rigid: SikaTop® Seal-107 DRYSEAL<br>Elastic: Sikagard®-550 W |

## BASIS OF PRODUCT DATA

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

## USES

For professional use only!

## FURTHER DOCUMENTS

For detailed application information, please refer to the latest Method Statement of Sikacrete®-213 F.

## ECOLOGY HEALTH AND SAFETY

For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Safety Data Sheet (SDS) containing physical, ecological, toxicological and other safety-related data.

## APPLICATION INSTRUCTIONS

### EQUIPMENT

Select the most appropriate equipment required for the project:

**Substrate preparation**

- High pressure water jetting

**Mixing**

- Suitable forced action mixer

**Application**

- Wet Spray - all in one mixing and spraying machine or separate spraying machine and all associated ancillary equipment to suit application volumes.

**Finishing**

- Trowel (PVC or wooden)
- Sponge

## SURFACE PREPARATION

**Concrete:**
- Apply only to sound, well-prepared substrates.
- Before application, pre-dampen concrete surfaces to a water-saturated, but surface-dry condition.

**FRP Protection:**
- FRP 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, Sikadur®-330 (for SikaWrap®) or Sikadur®-30 (for Sika® Carbodur®).
- Broadcast the binding aggregate onto the wet prime coat to ensure optimal adhesion of Sikacrete®-213 F fire-resistant mortar.

## MIXING

1. Pour the minimum recommended clean water quantity into a suitable mixing container / equipment.
2. While stirring slowly, add the powder to the water.
3. Mix thoroughly for a minimum of 5 minutes, adding additional water if needed - up to the specified maximum - to achieve a smooth, uniform consistency.

**Important:** The fresh mortar consistency must be checked after every mix.

## APPLICATION

Strictly follow installation procedures as defined in the latest Method Statement of Sikacrete®-213 F, application manuals and working instructions which must always be adjusted to the actual site conditions.

**Important:**
- Avoid application in direct sun and/or strong winds.
- Do not add water over recommended dosage.

**Sprayed application - Wet Spray**
1. Fill the freshly mixed Sikacrete®-213 F into suitable wet-spray equipment and apply it to the pre-wetted substrate, ensuring coverage within the specified minimum and maximum layer thickness and avoiding the formation of voids.
2. Where multiple layers are to be built up, to prevent sagging or slumping, each layer must be allowed to harden before applying subsequent layers.

**Note:** Include light wire mesh as required.

**Sprayed application - Dry Spray**
Dry spray application of Sikacrete®-213 F is possible, please contact Sika Technical Service for detailed application information.

**Surface finishing**
Carry out finishing to the required surface texture using suitable finishing tools up to one hour after application dependent on the temperature and humidity.

**Important:** Do not add additional water during the surface finishing as this may lead to discoloration and cracking.

## CURING TREATMENT

Protect fresh mortar immediately from freezing and premature drying using an appropriate curing method, e.g. curing compound, moist geotextile membrane, polythene sheet, thermal blankets etc.

**Important:** Curing compounds must not be used when they could adversely affect subsequently applied products and systems.

## CLEANING OF TOOLS

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

# LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

# 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. It may be necessary to adapt the above disclaimer to specific local laws and regulations. Any changes to this disclaimer may only be implemented with permission of Sika® Corporate Legal in Baar.

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