



Monokote[®] Fireproofing

Type Z-146

High Density Cementitious Fireproofing

Product Information/Description

Monokote[®] Type Z-146 High Density Cementitious Fireproofing has been developed by Grace Construction Products to meet specific commercial and industrial fire protection requirements. Type Z-146 is a Portland cement based, factory mixed material requiring only the addition of water on the job for application. It is spray applied directly to structural steel (beams & columns), providing up to 4 hours of fire resistance. Its physical characteristics are excellent for areas exposed to environmental and of extreme climatic conditions. Type Z-146 may also be used in areas where high durability is required such as parking garages. Type Z-146 is ideal for use in clean room environments where issues such as particle emissions and off gassing are critical to the interior environment within the building.

Features

Monokote[®] Type Z-146 offers the following significant advantages to the architects, engineers and applicators:

- Factory pre-mixed: Ready to use. No job site proportioning required. Simply add water in a standard paddle type plaster mixer and apply with conventional plastering equipment.

- Non toxic – the factory mixed blend of common Portland cement and inert materials require only the addition of water for mixing and application.
- Attractive Finishes: Monokote[®] Type Z-146 may be sprayed and/or trowelled to various textures. Monokote[®] Type Z-146 may also be integrally colored to meet job needs.
- Versatility: Monokote[®] Type Z-146 has been applied using equipment ranging from rotor-stator pumps to large hydraulic pumps. Please refer to your local AVI representative for details.
- Moisture Resistant: The Portland cement base affords excellent fire protection characteristics in areas subjected to high humidity.
- Durable: Its hardness and durability help resist accidental physical damage.
- Weatherable: Able to withstand freeze-thaw, wind, rain and other extremes of climatic conditions.
- Economical: Low material cost per square foot combined with spray-on application saves time and money.

Applications

Monokote[®] Type Z-146 may be used in parking garages, exterior exposure, mechanical rooms and other areas where a high durable product is required.

Performance Characteristics

| Physical Properties | Recommended Specifications | Test Method | Laboratory Test* Value |
|--|---|--|--|
| Dry Density | 640 kg/m ³ (40 pcf) | ASTM E 605 | See Note Below*** |
| Bond Strength | 478 kN/m ² (10,000 psf) | ASTM E 736 (Modified)** | 609 kN/m ² (12,765 psf) |
| Compressive Strength @10% Deformation | 3.79 MPa (550 psi) | ASTM E 761 | 4.08 MPa (592 psi) |
| Hardness | 40 | ASTM D 2240 | 41 |
| Yield | - | Theoretical | 1.39 m ² at 25mm (15 Bft) per bag |
| Standard Color | - | - | Natural Concrete Grey |
| Volatile Organic Content (off gassing) at 50 °C organic compounds C6-C28 | Less than 1 PPMW (part per million by weight) | Dynamic Headspace (Thermal Desorbition Gas Chromatography-Mass Spectrometry) | Less than 1 PPMW (Below Detectable Limits) |
| Leachable Ammonia | Less than 50 PPB (Parts Per Billion, 50 Nanograms/mg) | Leachable Ion by Ion Chromatography | Less than 50 PPB (Below Detectable Limits) |

* Independent laboratory tested value. Report available upon request.

** Modified to allow for high-density, high-strength materials.

*** All in-place performance tests should be conducted at or below the minimum recommended specification density. Tests reported here were conducted at 632 kg/m³ (39.4 pcf).

Delivery and Storage

1. All material to be used for fireproofing shall be delivered in original unopened packages bearing the name of the manufacturer, the brand and proper Underwriters Laboratories Inc. labels for fire hazard and fire resistance classifications.
2. The material shall be kept dry until ready for use. Packages of material shall be kept off the ground, under cover and away from sweating walls and other damp surfaces. All bags that have been exposed to water before use shall be discarded. Stock of material is to be rotated and used before its expiration date.

Steel and Concrete Surfaces

1. Prior to the application of Monokote® Type Z-146 fireproofing, an inspection shall be made to determine that all steel surfaces are acceptable to receive fireproofing. The steel to be fireproofed shall be free of oil, grease, excess rolling compounds or lubricants, loose mill scale, excess rust, non-compatible primer, lock down agent or any other substance that will impair proper adhesion. When necessary, the cleaning of steel surfaces to receive fireproofing shall be the responsibility of the general contractor.
2. The project architect shall determine if the painted/primed structural steel to receive fireproofing has the material tested in accordance with ASTM E119, to provide the required fire resistance rating.
3. Prior to the application of Monokote® Type Z-146, a bonding agent, approved by the fireproofing manufacturer, shall be applied to all concrete surfaces to receive Monokote® Type MK-6/HY.

Mixing

- a) Monokote® Type Z-146 fireproofing shall be mixed by machine in a conventional, plaster-type mixer or a continuous mixer specifically modified for cementitious fireproofing. The mixer shall be kept clean and free of all previously mixed material. The mixer shall be adjusted to the lowest speed which gives adequate blending of the material and a mixer density of 833-945 kg/m³ (52-59 pcf) of material.
- b) Using a suitable metering device and a conventional mixer, all water shall be first added to the mixer as the blades turn. Mixing shall continue until the mix is lump-free with a creamy texture. All material is to be thoroughly wet. Target density of 833-945 kg/m³ (52-59 pcf) is most desirable. Over-mixing Monokote® Type Z-146 will reduce pumping rate and will negatively effect in-place density and mechanical properties.

Application

1. Application of Monokote® Type Z-146 Fireproofing can be made in the following sequence:
 - a. For thicknesses of approximately 22mm (7/8 in.) or less, material can be applied in one pass.

- b. For thicknesses of approximately 25mm (1 in.) or greater, material should be applied in multiple passes. Subsequent passes will be applied once the first coat has set.

2. Monokote® Type Z-146 fireproofing material shall not be used if it contains partially set, frozen or caked material.
3. Monokote® Type Z-146 shall have a minimum average dry, in-place density of 640 kg/m³ (40 lb/ft³).
4. Monokote® Type Z-146 is formulated to be mixed with water at the job site.
5. Monokote® Type Z-146 is applied directly to the steel, at various rates of application which will be job dependent, using standard plastering type equipment or continuous mixer/pump units. A spray gun with a properly sized orifice and spray shield, and air pressure at the nozzle of approximately 38 kPa (20 psi) will provide the correct hangability, density and appearance.
NOTE: If freshly sprayed Monokote® Type Z-146 does not adhere properly, it is probably due either to a too wet mix, poor thickness control, or an improperly cleaned substrate.

Temperature and Ventilation

1. An air and substrate temperature above 4.4 °C (40 °F) shall be maintained for 24 hours prior to application, during application and for a minimum of 24 hours after application of Monokote® Type Z-146.
2. Provisions shall be made for ventilation to properly dry the fireproofing after application. In enclosed areas lacking natural ventilation must be provided to achieve a minimum total air exchange rate of 4 times per hour until the material is substantially dry.

Field Tests

1. The architect will select, and the owner will pay for an independent testing laboratory to sample and verify the thickness and density of the fireproofing in accordance with the provisions of ASTM E 605, "Standard Test Method for Thickness and Density of Sprayed Fire Resistive Material Applied to Structural Members" or Uniform Building Code Standard No. 43-8 "Thickness and Density Determination for Spray Applied Fireproofing".

Safety

1. Monokote® Type Z-146 is slippery when wet. The general contractor and applicator shall be responsible for posting appropriate cautionary "SLIPPERY WHEN WET" signs. Signs should be posted in all areas in contact with wet fireproofing material. Anti-slip surfaces should be used on all working surfaces.
2. Material Safety Data Sheets for Monokote® Type Z-146 is available upon request.



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