

MONOKOTE® Z-146T

High Density Tunnel Grade Cementitious Fireproofing Product data and application instructions

Product Description

Monokote® Z-146T high density cementitious fireproofing has been developed by GCP Applied Technologies to meet specialty and industrial fireproofing requirements requiring greater resistance to harsh environmental conditions.

Z-146T is a Portland cement-based, factory-mixed material requiring only the addition of water on the job for application. It is spray applied, providing up to 4 hours of fire resistance. Its physical characteristics are excellent for areas exposed to environmental or climatic conditions.

Z-146T may be used in areas where high durability and corrosion resistance is required such as substrates subjected to exterior exposure.

Approvals

- Up to 4 hours in accordance with the Rijkswaterstaat (RWS) fire curve
- Up to 4 hours in accordance with UL 1709 hydrocarbon test
- Jet fire testing in accordance with HSE standard OTI 95 634
- Up to 4 hours in accordance with UL 263 (ASTM E119)
- Investigated by UL for exterior use

Features & Benefits

Z-146T offers the following advantages to 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.

- **Attractive finishes**—Z-146T may be sprayed or hand troweled after spraying to achieve a lightly textured appearance.
- **Equipment versatility**—Z-146T can be mixed in a standard plaster mixers. After mixing, Z-146T may be spray-applied with commonly available pumping and spraying equipment.
- **Corrosion inhibition**—Z-146T neither prevents nor promotes the corrosion of steel, however, the inclusion of calcium nitrite as a corrosion inhibitor has been shown to retard the rate of corrosion due to salt and other aggressive environmental conditions.
- **Durable**—Hardness and durability help resist accidental physical damage.
- **Weatherable**—Able to withstand freeze/thaw, wind, rain and other climatic conditions.

Uses

Z-146T may be used in roadway tunnels and in exterior environments where a highly durable fireproofing is required and a threat of steel corrosion is present.

Delivery & Storage

- All material to be used for fireproofing should 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.
- The material should be kept dry until ready for use. Keep packages of material off the ground, under cover and away from sweating walls and other damp surfaces. All bags that have been exposed to water before use should be discarded. Stock of material is to be rotated and used before its expiration date.

Performance Characteristics

Physical Properties	Recommended Specifications	Laboratory Tested* Value	Test Method/Notes**
Dry density	Min. 40 pcf (640 kg/m ³)	See note below***	ASTM E605
Bond strength	Min. 10,000 psf (478 kPa)	16,727 psf (800 kPa)	ASTM E736
Compressive strength @ 10% deformation	500 psi (3.45 MPa)	561 psi (3.87 MPa)	ASTM E761
Hardness	40	49	ASTM D2240
Yield	—	16.7 board feet (1.55 m ² at 25 mm) per bag	Theoretical maximum
Color	—		Natural concrete gray
Volatile Organic Content (off gassing) at 122°F (50°C) organic compounds C6-C28	Less than 1 PPMW (part per million by weight)	Less than 1 PPMW (Below detectable limits)	Dynamic headspace (Thermal desorption gas chromatography—mass spectrometry)
Leachable ammonia	Less than 50 PPB, 50 nanograms/mg	Less than 50 PPB (Below detectable limits)	Leachable ion by ion chromatography

* Independent laboratory tested value. Report available upon request.

** ASTM International test methods modified for bond strength and compressive strength, where required for high density, high performance products.

*** All in-place performance tests should be conducted at or below the minimum recommended specification density.

Steel & Concrete Surfaces

- a. Prior to the application of Z-146T, an inspection should be made to determine that all steel surfaces are acceptable to receive fireproofing. The steel to be fireproofed should be free of oil, grease, excess rolling compounds or lubricants, loose mill scale, excess rust, noncompatible primer, lock down agent or any other substance that will impair proper adhesion. Where necessary, the cleaning of steel surfaces to receive fireproofing will be the responsibility of the general contractor.
- b. Prior to application of Z-146T, a bonding agent, approved by the fireproofing manufacturer, should be applied to all concrete substrates to receive 146T.
- c. The project architect will determine if the painted/primed steel to receive fireproofing has been tested in accordance with ASTM E119, to provide the required fire resistance rating.

Mixing

- a. Z-146T should be mixed by machine in a conventional, plaster-type mixer or a continuous mixer specifically modified for cementitious fireproofing. The mixer should be kept clean and free of all previously mixed material. Adjust the mixer speed in a conventional mixer to the lowest speed which gives adequate blending of the material and a mixer density of 50 to 60 pcf (800 to 961 kg/m³) of material.
- b. Using a suitable metering device and a conventional mixer, add all water to the mixer as the blades turn. Mixing should continue until the mix is lump-free, with a creamy texture. All material is to be thoroughly wet. Overmixing Z-146T will reduce pumping rate and will negatively effect in-place density and mechanical properties.

Application

- a. Z-146T material should not be used if it contains partially set, frozen or caked material.
- b. Z-146T should have a minimum average dry, in-place density of 40 lbs/ft³ (640 kg/m³).
- c. Z-146T is formulated to be mixed with water at the job site.
- d. Z-146T 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 20 psi (0.138 MPa), will provide the correct hangability, density and appearance.

Note: If freshly sprayed Z-146T does not adhere properly, it is most likely due to a too wet mix, poor thickness control, or an improperly cleaned substrate.

Temperature & Ventilation

- a. The substrate temperature shall be a minimum of 40°F (4.5°C) for at least 1-hour prior to the application of the Monokote. Additionally, the air and substrate temperature during application and for a minimum of 72 hours after application shall be no less than 40°F (4.5°C).
- b. Provisions shall be made for ventilation to properly dry the fireproofing after application. In enclosed areas lacking natural ventilation, air circulation and ventilation must be provided to achieve a minimum total fresh air exchange rate of 4 times per hour until the material is substantially dry.

Field Tests

- a. The architect will select an independent testing laboratory (for which the owner will pay) to sample and verify the thickness and density of the fireproofing in accordance with the applicable building code.
- b. The architect will select an independent testing laboratory (for which the owner will pay) to randomly sample and verify the bond strength of the fireproofing. Note: No recognized field bond strength test procedure exists for sprayed fireproofing materials with bond strengths greater than 1,000 psf (4,882 kg/m²) such as Monokote Z-146. Where bond strength specifications exceed 1,000 psf (4,882 kg/m²) it is recommended that independent laboratory test data based upon a modified version of ASTM E736 be submitted to verify specification compliance.
- c. Results of the above tests will be made available to all parties at the completion of pre-designated areas which shall have been determined at a pre-job conference.

Safety

- a. Monokote 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.
- b. Material Safety Data Sheets for Monokote Z-146T is available on our web site at www.gcpat.com or by calling 866-333-3SBM.

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate, and is offered for consideration, investigation and verification by the user, but we do not warrant the results to be obtained. Please read all statements, recommendations, and suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation, or suggestion is intended for any use that would infringe any patent, copyright, or other third party right.

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