MONOKOTE® Z-156T Product Data Sheet

Ultra high density tunnel grade fireproofing

Product Description

MONOKOTE® Z-156T 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.

MONOKOTE® Z-156T 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.

MONOKOTE® Z-156T 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 UL 1709 hydrocarbon test
- Up to 4 hours in accordance with UL 263 (ASTM E119)
- Investigated by UL for exterior use

Features & Benefits

MONOKOTE® Z-156T 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 - MONOKOTE® Z-156T may be sprayed or hand troweled after spraying to achieve a lightly textured appearance.
- Equipment versatility - MONOKOTE® Z-156T can be mixed in standard plaster mixers. After mixing, MONOKOTE® Z-156T may be spray-applied with commonly available pumping and spraying equipment.
- Corrosion inhibition - MONOKOTE® Z-156T 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 maximum durability help resist accidental physical damage even in the toughest exposures.
- Weatherable - Able to withstand freeze/thaw, wind, rain and other climatic conditions.

- Transparent - Complete Life Cycle Assessment and Environmental Product Declaration

Uses

MONOKOTE® Z-156T 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 of 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 SPECIFICATION	LABORATORY TESTED* VALUES	TEST METHOD **
Dry density, minimum average	Min. 50 pcf (800 kg/m^3)	See note below***	ASTM E605
Global Warming Potential (GWP)[1]	Max 750 Kg (1,653 lbs) $kgCO_2e$	610 Kgs (1,369 lbs) $kgCO_2e$	ASTM Product Category Rule for SPFM
Bond strength	Min. 10,000 psf (478 kN/m^2)	20,680 psf (990 kPa)	ASTM E736
Compression, 10% deformation	850 psi (5.86 MPa)	874 psi (6.03 MPa)	ASTM E761
Air erosion	Max 0.000 g/ft^2 (0.00 g/m^2)	0.000 g/ft^2 (0.00 g/m^2)	ASTM E859
High velocity air erosion	No continued erosion after 4 hours	No continued erosion after 4 hours	ASTM E859
Hardness	40	91	ASTM D2240
Bond impact	No cracking, spalling or delamination	No cracking, spalling or delamination	ASTM E760
Deflection	No cracking, spalling or delamination	No cracking, spalling or delamination	ASTM E759
Resistance to mold growth	No growth after 28 days	No growth after 28 days	ASTM G21
Surface burning characteristics	Flame spread = 0 Smoke developed = 0	Flame spread = 0 Smoke developed = 0	ASTM E84
Combustibility	Less than 5 MJ/m^2 total, 20 kw/m^2 peak heat release	Less than 5 MJ/m^2 total, 20 kw/m^2 peak heat release	ASTM E1354

* 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.

1 Product Category Rule for SFRM defines measurable unit as 1000 kgs of product.

Steel & Concrete Surfaces

- Prior to the application of MONOKOTE® Z-156, 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.
- Prior to application of MONOKOTE® Z-156, a bonding agent, approved by the fireproofing manufacturer, should be applied to all concrete substrates to receive Z-156T.
- 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

- MONOKOTE® Z-156T should be mixed by machine in a conventional, plaster-type mixer or a continuous mixer specifically modified for cementitious fireproof-ing. 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 65 to 70 pcf (1040 to 1120 kg/m^3) of material.
- 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-156T will reduce pumping rate and will negatively effect in-place density and mechanical properties.

Application

- MONOKOTE® Z-156T material should not be used if it contains partially set, frozen or caked material.
- MONOKOTE® Z-156T should have a minimum average dry, in-place density of 50 lbs/ft^3 (800 kg/m^3).
- MONOKOTE® Z-156T is formulated to be mixed with water at the job site.
- MONOKOTE® Z-156T 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.
- Reinforcement - Most fire tests conducted have been carried out without lath or mesh reinforcement. For maximum long-term service durability in exterior conditions, the use of lath or mesh is recommended.

NOTE: If freshly sprayed MONOKOTE® Z-156T does not adhere properly, it is most likely due to a too wet mix, poor thickness control, or an improperly cleaned substrate.

Temperature & Ventilation

- 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 or 72 hours after application shall be no less than 40°F (4.5°C).
- 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

- 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 the applicable building code.
- 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/m ^{2}) such as MONOKOTE® Z-156. Where bond strength specifications exceed 1,000 psf (4,882 kg/m ^{2}) it is recommended that independent laboratory test data based upon a modified version of ASTM E736 be submitted to verify specification compliance.
- 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

- MONOKOTE® Z-156 is slippery when wet. Signs reading “SLIPPERY WHEN WET” should be posted in all areas in contact with wet fireproofing material. Anti-slip surfaces should be used on all working surfaces.
- SDS (Safety Data Sheets) for MONOKOTE® Z-156 are available on our web site or call toll free at 866-333-3SBM.

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GCP Applied Technologies, 20 Moores Road, Malvern, PA 19355, USA.
GCP Canada, Inc., 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6
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