MONOKOTE Z-156T

Ultra high density, cementitious fireproofing for tunnels and severe environmental exposure

PRODUCT DESCRIPTION

Monokote Z-156T high density cementitious fireproofing has been developed by Grace Construction Products to meet specialty and industrial fireproofing requirements requiring greater resistance to harsh environmental conditions.

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.

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 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 UL263 (ASTM E119)
- Investigated by UL for exterior use

FEATURES AND BENEFITS

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.
- **Non-toxic** – The factory-mixed blend of common Portland cement and other inert materials requires only the addition of water for mixing and application.
- **Attractive finishes** – Z-156T may be sprayed or hand troweled after spraying to achieve a lightly textured appearance.
- **Equipment versatility** – Z-156T can be mixed in a standard plaster mixers. After mixing, Z-156T may be spray-applied with commonly available pumping and spraying equipment.
- **Corrosion inhibition** – 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.
- **Moisture resistant** – the Portland cement base affords excellent fire protection characteristics in areas subjected to high humidity.
- **Durable** – Hardness and durability help resist accidental physical damage.
- **Weatherable** – Able to withstand freeze/thaw, wind, rain and other climatic conditions.

PERFORMANCE CHARACTERISTICS

Physical Properties	Recommended Specifications	Test Method/Notes**	Laboratory Tested* Value
Dry density	Min. 50 pcf (800 kg/m^3)	ASTM E 605	See note below***
Bond strength	Min. 10,000 psf (478 kN/m^2)	ASTM E 736	>26,536 psf >1265 kN/m^2)
Compressive strength @ 10% deformation	850 psi (5.86 MPa)	ASTM E 761	1059 psi (7.32 MPa)
Hardness	40	ASTM D 2240	91
Yield	-	Theoretical maximum	13.3 board feet (1.24m^2 at 25mm) per bag
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)	Dynamic headspace (Thermal desorbtion gas chromatography-mass spectrometry)	Less than 1 PPMW (below detectable limits)
Leachable ammonia	Less than 50 PPB, 50 nanograms/mg	Leachable ion by ion chromatography	Less than 50 PPB (below detectable limits)

* 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. Test reports here were conducted at 39.6 pcf (635 kg/m^3)

USES

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 AND STORAGE

a. 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.
b. 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.

STEEL AND CONCRETE SURFACES

a. Prior to the application of Z-156T, 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, non-compatible 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-156T, a bonding agent, approved by the fireproofing manufacturer, should be applied to all concrete substrates to receive Z-156T.
c. The project architect will determine if the painted/primed steel to receive fireproofing has been tested to provide the required fire resistance rating.

MIXING

a. Z-156T 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 65 to 70 pcf (1040 to 1120 kg/m^3) 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. Over-mixing Z-156T will reduce pumping rate and will negatively effect in-place density and mechanical properties.

APPLICATION

a. Z-156T material should not be used if it contains partially set, frozen or caked material.
b. Z-156T should have a minimum average dry, in-place density of 50 lbs/ft^3 (800 kg/m^3).
c. Z-156T is formulated to be mixed with water at the job site.
d. Z-156T is applied directly to the substrate, 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-156T does not adhere properly, it is most likely due to a too wet mix, poor thickness control, or an improperly cleaned substrate.

TEMPERATURE

a. An air and substrate temperature of 40°F (4.5°C) minimum should be maintained for 24 hours prior to application, during application and for a minimum of 72 hours after application of Z-156T.

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 provisions of ASTM E605-77, 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.

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-156T. 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.

SAFETY

1. Z-156T 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.
2. A Material Safety Data Sheet for Monokote Z-156T is available on www.graceconstruction.com or call Arabian Vermiculite Industries - +9663/8547-1450