ARABIAN VERMICULITE INDUSTRIES

Monokote Type Z-146

High Density Cementitious Fireproofing

Product Information

Monokote Z-146 High Density Cementitious Fireproofing has been developed by Grace Construction Prods. To meet specialty, commercial and industrial fireproofing requirements. Type Z-146 is a Portland cement based, factory 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 of climactic conditions. Also, Type Z-146 may 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

Type Z-146 offers the following advantages to the architect, owner, applicator and building occupant.

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, requires only the addition of water for mixing and application.

Attractive Finishes: Type Z-146 may be sprayed and/or trowelled to various textures. Type Z-146 may also be integrally colored to meet job needs.

Versatility: 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.

Durable: Its hardness and durability help resist accidental physical damage.

Weatherable: The Portland cement base affords excellent fire protection characteristics in areas subjected to high humidity.

Economical: Low material cost per square foot combined with direct spray-on application saves time and money.

Applications

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

Recommended Specifications - High Density Products

Physical Properties	Recommended Specifications	Test Method	Laboratory Test* Value
Dry Density	Min. 640 kg/m^3 (40 pcf)	ASTM E 605	See Note Below***
Bond Strength	Min. 478 kN/m^2 (10,000 pcf)	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 Maximum	1.55 m^2 at 25mm (16.7 board fee) per bag
Color	-	Natural Concrete Gray	Black/White Available as Special Order
Volatile Organic Content (off gassing) at 50°C organic compounds C6-C28	Less than 1 PPMW (Part Per Million by Weight)	Dynamic Headspace (Thermal Dissorbtion Gas Chromatography-Mass Spectrometry)	Less than 1 PPMW (Below Detectable Limits)
Leachable Ammonia	Less than 1 PPB (50 Parts Per Billion, 50 Nanograms/mg)	Leachable Ion by Ion Chromatography	Less than 50 PPB (Below Detectable Limits)
Surface Burning Characteristics		ASTM E 84 (UL 723)	Flame Spread - 0 Smoke Developed - 0
Bond Impact		ASTM E 760	No crack; no spalling; no delamination remained unchanged
Corrosion Resistance		ASTM E 937	No corrosion – 0
Deflection		ASTM E 759	No crack, spall or delaminate and remained unchanged
Fungal Resistance		ASTM G 21	No fungal growth

www.avi-sa.com | info@avi-sa.com
Arabian Vermiculite Industies P.O. Box 7137, Dammam 31462, Saudi Arabia Tel: +966 13 847 1450 Fax: +966 13 847 1575

Sound Absorption		ASTM C 423	NRC 0.6-0.80 at 25mm thickness
Combustion		ASTM E 1354	Not combustible

- 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/m^3 (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 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. Where necessary, the cleaning of steel surfaces to receive fireproofing shall be the responsibility of the general contractor.
2. Prior to application of Monokote Type Z-146, a bonding agent approved by the fireproofing manufacturer shall be applied to all concrete substrates to receive Type Z-146.
3. The project architect shall determine if the painted/primed steel to receive fireproofing is compatible with Monokote Type Z-146.

Mixing

- 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 speed in a conventional mixer shall be adjusted to the lowest speed which gives adequate blending of the material and a mixer density of 833 to 945 kg/m^3 (52 to 59 pcf) of material.
- 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 to 945 kg/m^3 (52 to 59 pcf) is most desirable. Over-mixing Type Z-146 will reduce pumping rate and will negatively affect in-place density and mechanical properties.

Application

1. Application of Type Z-146 Fireproofing can be made in the following sequence:
   - For thicknesses of approximately 22mm (7/8 in.) or less, apply in one pass.
   - For thicknesses of 25mm (1 in.) or greater, apply subsequent passes after the first coat has set.
2. Type Z-146 Fireproofing material shall not be used if it contains partially set, frozen, or caked material.
3. Type Z-146 shall have a minimum average dry, in-place density of 640 kg/m^3 (40 lb/ft^3).
4. Type Z-146 is formulated to be mixed with water at the job site.
5. Type Z-146 is applied directly to the steel, at various rates or 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 0.138 Mpa (20 psi) will provide the correct hangability, density and appearance.

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



Monokote Type Z-146 provides concrete protection for high traffic manufacturing environments.

Temperature and Ventilation

1. An air and substrate temperature of 4.5°C (40°F) minimum shall be maintained for 24 hours prior to application, during application and for a minimum of 24 hours after application of Type Z-146.
2. 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 air exchange rate of 4 times per hour until material is substantially dry.

Field Tests:

1. The architect may 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 605-77, “Standard Test Method for Thickness and Density of Sprayed Fire Resistive Material Applied to Structural Member” 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 4,882 kg/m^2 (1,000 psf) it is recommended that independent laboratory test data based upon a modified version of ASTM E 736 be submitted to verify specification compliance.

Safety:

1. Type Z-146 is slippery when wet. The general contractor and applicator shall be responsible for posting appropriate 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. A Material Safety Data Sheet for Monokote Type Z-146 is available upon request.