

This is a Generic Document.

**METHOD STATEMENT FOR THE
CORRECT APPLICATION OF
MONOKOTE Z-106/106HY
(DOCUMENT NUMBER
SCT/MS/MONOKOTE Z-106/106HY
- 001)**

1.0 MATERIALS.

Material shall be MONOKOTE Type Z-106/106HY as manufactured and supplied by Arabian Vermiculite Industries (AVI) Dammam, Saudi Arabia.

2.0 THICKNESSES MONOKOTE.

Materials shall be applied in dry film thicknesses as recommended by AVI to meet the desired fire rating requirements of the project specification. No thickness shall be less than 9.0mm as per the site requirements / specifications.

3.0 DELIVERY AND STORAGE.

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. 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.

4.0 APPLICATION.

4.1.a It shall be ensured by Main Contractor that all roofing works and concrete flooring works on profiled metal deck are completed prior to the start of MONOKOTE application.

b. All Fire proofing works must and will commence before erection of any all MEP Services.

4.2 Surfaces not requiring fireproofing will be protected against over-spray by providing masking by Main Contractor.

4.3 Steel surface temperature shall be above dew point.

- 4.4 0°C and rising. It should however be below 50 °C prior to the application of MONOKOTE. In case of higher substrate temperature the steel surface shall be cooled down with water to ensure that same is below 50 °C.
- 4.5 The steel surface to receive fireproofing will be free of oil, grease, excess rolling compounds, loose mill scale or any other substance that will impair the adhesion of MONOKOTE to the steel surface. Applicator will ensure that the steel surface to receive Monokote is acceptable for this application.
- 4.6 Steel members where the sizes of Flange or Web exceed the following limits specified by UL will have mechanical breaks provided with expanded diamond metal lath fixed to these surfaces with Hilti fired/welded pins so that the clear spans do not exceed the following limits. Expanded metal lath will be 0.9 kg/m² with the width of lath on steel member not to be less than 89mm: (if Applicable)
- Beam flange width is in excess of 305mm
 - Column flange width is in excess of 406mm
 - Beam or Column depth is in excess of 406mm
 - Pipe outer diameter or Tube width is in excess of 305mm
- 4.7 MONOKOTE Z-106/106HY shall be applied by spray on to clean steel as per the procedure delineated in the material data sheet. Thicknesses will be applied in single coat so long the material hangs well on to the steel substrate. Higher thicknesses will be applied in multi-coats. As a general rule apply thicknesses in excess of 16mm in multi-coats. Wet thickness measurements shall be taken during and after the application to ensure application of recommended thicknesses.
- 4.8 Crest areas of the profiled metal deck (areas between Beam Flange and the Metal Deck Profile) where the metal deck sits right on top of the beam flange, shall be filled with Monokote as per the UL Design requirement. (If Applicable)

4.9 Provision shall be made for ventilation to properly dry the fireproofing after application.

5.0 FIELD QUALITY CONTROL.

Field checks will be carried out for Applied Thickness, Material Bond and In-Place dry density of the applied Monokote Z-106/106HY.

6.0 CLEANING.

Post application all areas around that have been affected by material over-spray, will be cleaned and empty bags/waste materials shall be moved away from the work place.

7.0 SAFETY.

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.

8.0 REPAIR PROCEDURE.

8.1 CRACKS REPAIR.

- Cut V-groove going right up to the depth of the crack.
- Clean the surface of any loose material.
- Fill up the V-groove with freshly mixed Monokote to finish level with the existing thickness around.
- Hand patching is accepted for an area of 144 square inch. Any larger surface will be spray repaired.

8.2 DAMAGE REPAIR.

- Cut off and remove the damaged portion of applied Monokote right up to the sound adhering Monokote all around.
- Clean the surface of any loose Monokote.
- In case the steel is primed, ensure that the primer has not got damaged. If damaged, repair the primer.
- Apply one coat of Firebond wherever it is existing.
- Spray or Hand apply Monokote material prepared fresh to fill up the opened area of steel to make it level with the existing sound Monokote coating all around.
- Hand patching is accepted for an area not exceeding 144 square inch. Larger surface than this will be spray applied only.



Monokote[®] Fireproofing

Type Z-106 & Type Z-106/HY

Medium Density Cementitious Fireproofing

Product Information/Description

Monokote[®] Type Z-106 and Type Z-106/HY are Portland cement based cementitious fireproofing designed to meet specific commercial and industrial fire protection requirements on structural steel members, floor/ceiling and roof/ceiling assemblies.

Monokote[®] Type Z-106 and Type Z-106/HY are hard, moisture resistant and suitable for interior areas where resistance to moisture and abrasion is needed. Formulated for use with Grace's patented Injection System. Monokote[®] Type Z-106 offers high yield and improved application characteristics while providing resistance to repeated physical contact and/or high humidity.

Note: Monokote[®] Type Z-106 and Type Z-106/HY afford the same level of fire protection and physical performance. Specifying both Monokote[®] Type Z-106 and Type Z-106/HY allows alternatives to provide the most cost effective installation while assuring the specifier of the same high in-place performance characteristics.

Applications

Monokote[®] Type Z-106 and Type Z-106/HY can be used for interior, exposed applications where abrasion, high humidity and damage resistance are desired such as;

- Special use areas in commercial buildings
- Transportation terminals
- Convention centres
- Stairwells
- Parking garages
- Elevator shafts
- Light manufacturing areas and facilities
- Mechanical rooms

Recommended Specifications – Medium Density Products

Physical Properties	Type Z-106	Type Z-106/HY	Test Method	Laboratory Test* Value
Minimum Density	352 kg/m ³ (22 pcf)	352 kg/m ³ (22 pcf)	ASTM E 605	See Note Below**
Minimum Bond Strength	94.5 kN/m ² (2,000 psf)	94.5 kN/m ² (2,000 psf)	ASTM E 736	Greater than 94.5 kN/m ² (2,000 psf)
Minimum Compressive Strength @ 10% Deformation	680 kPa (100 psi)	680 kPa (100 psi)	ASTM E 761	Greater than 680 kPa (100 psi)
Deflection and Bond Impact	No cracking No delamination	No cracking No delamination	ASTM E 759 ASTM E 760	Pass Pass
Air Erosion	0.000 gm/m ²	0.000 gm/m ²	ASTM E 859	0.000 gm/m ²
Mold Inhibitor	Yes	Yes	ASTM G 21	Pass / No Growth
Standard Color	Grey	Grey	N/A	N/A

* Actual laboratory tested values meet or exceed Grace's recommended value. Test reports are available on request from Arabian Vermiculite Industries

** ASTM test methods modified where required, for high density, high performance product

- Gymnasiums and pool areas
- Correctional facilities

Benefits

Monokote[®] Type Z-106 and Type Z-106/HY offer many significant advantages to the architect, owner, applicator and building occupant. These include:

- Durability – 100% Portland cement binder provides increased durability in interior environments where high traffic resistance to physical abuse is required
- Moisture Resistant – Provides excellent resistance to high humidity and condensation
- Quick Set – HY formulation allows use with Grace patented Injection System for high yield and quick set
- Applicator friendly - low pumping pressures allow use of small diameter hoses for increased maneuverability and greater pumping distances
- Non toxic – the factory mixed blend of common Portland cement and inert materials require only the addition of water for mixing and application

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-106 and Type Z-106/HY, 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 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-106 and Type Z-106/HY, a bonding agent, approved by the fireproofing manufacturer, shall be applied to all concrete surfaces to receive Monokote® Type Z-106/HY.
 4. Fireproofing to the underside of roof deck assemblies shall be done only after roofing application is complete and roof traffic has ceased.
 5. No fireproofing shall be applied prior to the completion of concrete work on steel decking.
3. Monokote® shall have a minimum average dry, in-place density of 352 kg/m³ (22 lb/ft³).
 4. Monokote® is formulated to be mixed with water at the job site.
 5. Monokote Accelerator may be used with Monokote® Type Z-106/HY to enhance set characteristics and product yield. The Monokote Accelerator is injected into the Monokote® Type Z-106/HY at the spray gun. Monokote Accelerator shall be mixed and used according to manufacturer's recommendations.
 6. Monokote® 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.

Mixing

- a) Monokote® Type Z-106 and Type Z-106/HY 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 610-690 kg/m³ (38-43 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 610-690 kg/m³ (38-43 pcf) is most desirable. Over-mixing Monokote® Type Z-106 or Type Z-106/HY will reduce pumping rate and will negatively effect in-place density and mechanical properties.

Application

1. Application of Monokote® Type Z-106 and Type Z-106/HY Fireproofing can be made in the following sequence:
 - a. Required fire rating thickness will determine if a multi-pass operation is required. If the first pass can be applied at a thickness sufficient to obtain the required rating, a second pass will not be required.
 - b. Where the full required thickness can not be applied in a single pass, subsequent passes can be applied only after the first coat has set.
2. Monokote® Type Z-106 and Type Z-106/HY fireproofing material shall not be used if it contains partially set, frozen or caked material.

Temperature and Ventilation

- a) 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.
- b) 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 Test

- a) 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. 7-6 "Thickness and Density Determination for Spray Applied Fireproofing". Where samples are of irregular shape (or sprayed texture), the displacement method (ASTM E 605 published in AWCI Technical Manual 12-A) shall be used to determine in-place density.
- b) The architect will select, and the owner will pay an independent testing laboratory to randomly sample and verify the bond strength of the fireproofing in accordance with the provisions of ASTM E 736.
- 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® Type Z-106 and Type Z-106/HY are available upon request.



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