

# Monokote® Type Z-3306

## Thermal Barrier

Monokote® Type Z-3306 Thermal Barrier is a cementitious fire protective coating specifically formulated for application over rigid, urethane and polystyrene foam plastics. Spray-applied to interior foam surfaces on walls and ceilings, Type Z-3306 forms a hard, durable, monolithic thermal barrier against heat and fire.

Type Z-3306 is a mill-mixed product requiring only the addition of water. It can be easily applied to required thickness in a single pass resulting in an efficient, low-cost method of meeting building code and insurance requirements.

In developing Type Z-3306, Grace Construction Products has utilized its experience and technology as the producer of Monokote® Spray Fireproofing Products — the most widely used structural steel fireproofing brand in North America. Sales and technical personnel located throughout the United States and Canada provide close technical support to contractors, owners and specifiers.

### Benefits

While specific requirements differ from locality to locality, the use of foam plastics for most building occupancies is permitted only when they are fully protected by an approved thermal barrier. Type Z-3306 has been successfully fire-tested and listed by Underwriters Laboratories Inc. and meets all known insurance and code requirements for thermal barriers. Type Z-3306 has a proven field and laboratory record of performance, reliability, ease of application and low in-place cost.

Listing Agency	Test Method	Substrate	Thickness of Type Z-3306
ULC	S124A	Foam Plastic	21 mm
	*S124B	Foam Plastic	17 mm
	S124C	Foam Plastic	20 mm
	S124D	Foam Plastic	17 mm

\*1990 National Building Code of Canada Requirement for 10 minute Class B rating.

Testing Agency	Test Method	Substrate	Thickness of Type Z-3306	Test Result
ULI	ICBO Enclosed Corner Test	Urethane Foam	13 mm	Type Z-3306 passes
		Styrene Foam	13 mm	Type Z-3306 passes
	ASTM E 119 (Protective Membrane)	Foam Plastic	19 mm	15 Minute Rating
			29 mm	30 Minute Rating
	ASTM E 84 (Tunnel Test)	Urethane Foam 5 cm (2 in.)	13 mm	Flame Spread 10 Fuel Contributed 0 Smoke Developed 0
			13 mm	Flame Spread 5 Fuel Contributed 0 Smoke Developed 0

### Proven Fire Test Performance

Type Z-3306 has successfully met ULI and ULC requirements as a thermal barrier over foam plastics.

### Economical

Ease of installation makes Type Z-3306 a low cost way to protect foam plastics.

### Workable

After being spray-applied, Type Z-3306 may be lightly trowelled.

### Damage Resistant

Type Z-3306 dries to a hard, durable surface which resists damage.

### Humidity Resistant

Type Z-3306 will not be affected by high humidity and reduces sweating often experienced in vegetable storage areas.

### Washable

When trowelled and painted, Type Z-3306 can be washed and cleaned.

### Physical Properties

#### Density:

384 kg/m<sup>3</sup> (24 pcf)

#### Bond Strength:

2441 kg/m<sup>2</sup> (500 lb/ft<sup>2</sup>)

#### Color:

Grey or White

#### Theoretical Yield:

25 bd ft/bag  
[4.6 m<sup>2</sup> at 12 mm thickness  
(50 ft<sup>2</sup> at ½ in.)]



### Installation

Type Z-3306 is easy to install. And, it arrives on the job site in strong poly-lined bags for easy handling and storage.

Type Z-3306 is mixed with water in a plaster-type mixer to form a consistent, pumpable slurry. This slurry is then spray-applied.

After spraying, Type Z-3306 may be trowelled to provide a flat, level surface and painted where desired. It can also be oversprayed with Topkrete® TK-610L for a concrete-like finish capable of withstanding severe physical abuse.

Type Z-3306 can be applied directly to most foam plastics. A bonding agent is required only on ceiling areas where repeated condensation may occur, on old urethane surfaces and over all polystyrene substrates.

Ask for the Type Z-3306 Equipment and Application Requirements brochure for detailed installation information.

### Typical Applications

Type Z-3306 may be used to protect foam plastics in many types of buildings. The following is a brief list of typical applications:

- Breweries
- Controlled atmosphere apple storage
- Fish processing plants
- Freezers
- Ice arenas
- Indoor tennis courts
- Pig and dairy barns
- Potato and vegetable storage
- Seed storage and processing
- Swimming pool/recreation centers
- Water treatment plants
- Welding shops

# Monokote® Type Z-3306

## Portland Cement Thermal Barrier

### SHORT FORM

Sprayed thermal barrier shall be Monokote® Type Z-3306 Thermal Barrier as manufactured by Grace Construction Products or its processing distributors. It shall be spray-applied by machine to the thickness required by local code specifications and as indicated on all drawings. The method of mixing and application shall comply with the manufacturer's recommendations as set forth in the current literature. In specified areas, bonding agents shall be those recommended by Grace Construction Products in current literature.

### RECOMMENDED SPECIFICATION

#### 1. Scope

The applicator shall provide all labor, materials and equipment required for:

- a. Complete installation of the thermal barrier.
- b. Application of a bonding agent where specified as necessary by Grace Construction Products in its current literature.
- c. Protection of adjacent surfaces from overspray.
- d. Removal of all dirt, oil and other foreign substances from the foam plastic surface which would impair proper thermal barrier adhesion.
- e. Removal of all decomposed foam which might impair thermal barrier adhesion.

#### 2. Material

- a. The sprayed material shall be Monokote Type Z-3306 Thermal Barrier as manufactured by Grace Construction Products or its processing distributors. All manufactured material shall be delivered in original unopened packages bearing the name of the manufacturer, the brand and the WH or ULC label. Materials shall be kept dry until ready for use. The packages of material shall be kept off the ground, under cover and away from sweating walls and other damp surfaces. Material that has been exposed to water before actual use shall be discarded. Stock is to be rotated and used before its stamped expiration date, unless specific written extension of that date is given by Grace Construction Products.
- b. Bonding agents, where necessary, are only to be those recommended by Grace Construction Products in its current literature, specifically for Monokote Type Z-3306 Thermal Barrier application.
- c. Water shall be clean and suitable for domestic consumption. It shall be free from such amounts of any substances as would affect the set or bond of the thermal barrier material.

#### 3. Acceptance and Performance Criteria

- a. The sprayed thermal barrier shall be listed by WH or ULC in accordance with ULC S124B.
- b. The thermal barrier shall have a minimum in-place density of 384 kg/m<sup>3</sup> (24 pcf) when tested in accordance with ASTM E 605-93.
- c. The thermal barrier shall have a minimum in-place bond strength of 500 psf over the protected substrate. The bond strength shall be determined by the following procedure:
  1. Glue a 76 mm (3 in.) diameter disk with center hook to the surface of the thermal barrier.
  2. Attach a scale with a 0 - 23 kg (0 - 50 lb) range to the hook. Exert a force perpendicular to the surface of the thermal barrier. The scale reading can be converted to pounds per square foot with the following formula:  
 Bond Strength (psf) = 
$$\frac{\text{Scale Reading (lb)} \times 144}{\pi \times (\text{Disk Radius})^2}$$
 For 76 mm (3 in.) Disk  
 Bond Strength (psf) = Scale Reading x 20.37
- d. The thermal barrier material shall not be subject to losses from the finished application by sifting, flaking or dusting.

#### 4. Installation

- a. Application of sprayed thermal barrier shall be in accordance with the printed instructions of the material manufacturer and the fire test report information.
- b. All surfaces to which sprayed thermal barrier will be applied shall be free of oil, grease, dirt, loose paint, decomposed foam or any other matter which would impair adhesion.
- c. A bonding agent shall be applied to all styrene foams and to all horizontal surfaces where free water is expected to condense (i.e., ceilings of very high humidity, potato storage facilities). Consult your local Grace Representative for bonding agent application details.
- d. Whenever a previously untested or questionable foam substrate is encountered, sufficient bond tests shall be run to determine if any special surface preparation is necessary. It is again anticipated that this would be limited to the application of a recommended bonding agent. Note: Monokote Type Z-3306 has shown excellent adhesion to all foamed substrates tested to date. Grace Construction Products, however, has no control over the many foam manufacturers formulas and when they might change.
- e. All roof construction must be complete, the roof must be watertight and all roof traffic must cease prior to application of Monokote Type Z-3306 on roof assemblies. Roof (foot) traffic must not resume until the coating has dried and full bond strength is achieved. Note: Drying time will vary according to material thickness, relative humidity and temperature. With good ventilation and fan-forced circulation, drying is usually complete in 10 - 14 days.

- f. All clips, hangers, supports, sleeves and other attachments to the foam substrate are to be placed prior to the application of the thermal barrier material.
- g. All patching and repairing of sprayed thermal barrier due to cutting by other trades, shall be performed under this section and paid for by the trade(s) that performed the cutting.

#### 5. Temperature and Ventilation

- a. When the outdoor temperature at the building site is less than 4°C (40°F), an air substrate temperature of 4°C (40°F) shall be maintained for 24 hours before application and until the thermal barrier is completely dry.
- b. Forty-eight hours after application of Monokote Type Z-3306, sufficient air circulation and ventilation shall be provided to dry the material. Note: Monokote Type Z-3306 shall be considered dry when its free moisture content is below 15% or when a representative sample placed in a fan-forced oven at 48°C (120°F) for 24 hours experiences a weight loss of less than 15% of its original weight.
- c. Coolers — Cooling shall not begin until Monokote Type Z-3306 Thermal Barrier is dry. Cooling shall be accomplished at a rate not to exceed -17°C/hr (1°F/hr) until a minimum temperature of 2°C (35°F) is obtained. Doors shall be open sufficiently during pull-down to relieve internal vacuum caused by cooling of the air.

- d. Freezers — Cooling to 2°C (35°F) shall be accomplished as detailed for coolers (above). The room shall then be held at 2°C (35°F) until the residual moisture has been removed and all components are in equilibrium condition. This period shall be no less than 7 days. The temperatures may then be dropped to operating temperatures as low as -29°C (-20°F) at a rate not to exceed -17°C/2 hrs (1°F/2 hrs). Total daily drop shall not exceed -12°C/day (10°F/day). After working temperature is reached temperature fluctuations within the room shall be controlled so as not to exceed -17°C/2 hrs (1°F/2 hrs) or -12°C/day (10°F/day). Note: The concrete slab will contract during pull-down, causing openings at the slab-to-wall joints and at contraction joints. If any caulking is necessary, it should be done prior to temperatures being dropped below 2°C (35°F).

#### 6. Cleanup

After completion of the thermal barrier installation, equipment shall be removed and all areas cleaned of deposits of sprayed thermal barrier materials.