

# TEXAS DEPARTMENT OF INSURANCE

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**PRODUCT EVALUATION**  
RC-28

Effective July 29, 1998  
Revised March 1, 2000

*The following product has been evaluated for compliance with the wind loads specified in Section 120 of the Texas Department of Insurance Windstorm Resistant Construction Guide and Section 103 of the Texas Windstorm Insurance Association Building Code for Windstorm Resistant Construction. This product shall be subject to reevaluation 3 years after the effective date.*

*This product evaluation is not an endorsement of this product or a recommendation that this product be used. The Texas Department of Insurance has not authorized the use of any information contained in the product evaluation for advertising, or other commercial or promotional purpose.*

*This product evaluation is intended for use by those individuals who are following the prescriptive portions of either the Texas Department of Insurance's Windstorm Resistant Construction Guide or the Texas Windstorm Insurance Association Building Code for Windstorm Resistant Construction. This product evaluation does not relieve a Texas licensed engineer of his responsibilities as outlined in the Texas Engineering Practice Act.*

**Tile Bond Roof Tile Adhesive** manufactured by

**Flexible Products Company**  
2050 North Broadway  
Joilet, Illinois 60435-3187

will be acceptable as an adhesive for adhering concrete and clay roofing tiles to roof decks of structures located in areas inland and seaward of the Intracoastal Waterway when installed in accordance with this product evaluation and the Tile Bond Roof Tile Adhesive Operating Instructions and Maintenance Booklet, as revised October 1997.

## PRODUCT DESCRIPTION

Tile Bond roof tile adhesive is a single component polyurethane foam adhesive for adhering concrete and clay roofing tiles to hot mopped 30/90 roof underlayment systems. The Tile Bond roof tile adhesive is dispensed from portable disposable systems using a Tile Bond gun dispenser. The disposable systems range in size from 12 oz cans to 50 lb. cylinders. The adhesive is dispensed in the form of paddies. The size of the paddy dispensed depends on the location of the tile application (field tile, eave tile, and hip or ridge tile).

## GENERAL REQUIREMENTS

**Licensed applicators:** Installation of the Tile Bond roof tile adhesive shall be by qualified applicators approved and licensed by Flexible Products Company. A list of licensed applicators is available from the Texas Department of Insurance.

**Roof tile manufacturers:** Flat/low profile, medium profile, and high profile concrete and clay roofing tiles manufactured by the following National Tile Roofing Manufacturer Association (NTRMA) member companies may be installed using Tile Bond roof tile adhesive in accordance with this product evaluation report and in accordance with the Tile Bond Roof Tile Adhesive Operating Instructions and Maintenance Booklet:

Monier-Lifetile LLC  
MCA  
Altusa (Almar USA)  
Ludowici Celadon  
Pioneer Roofing  
Westile

**Roof tile profile classifications:** Roofing tile profiles shall be classified as one of the following:

**Flat/Low profile:** Flat/Low profile tiles are defined as tiles having a rise equal to or less than  $\frac{1}{2}$  inch.

**Medium profile:** Medium profile tiles are defined as tiles having a rise greater than  $\frac{1}{2}$  inch and a rise to width ratio of less than or equal to 1:5.

**High profile:** High profile tiles are defined as those tiles having a rise to width ratio greater than 1.5.

**Roofing tile dimensions:** The flat/low profile, medium profile, and high profile roofing tiles shall be between 12 and 21 inches in length. The exposed width of the roofing tiles shall be between 8 and 15 inches. The maximum thickness of the tail of the roofing tiles shall not exceed  $1\frac{3}{8}$  inch. Each roofing tile shall have at least  $\frac{2}{3}$  of the tile's area free of adhesive contact.

### INSTALLATION INSTRUCTIONS

**Roof framing and roof deck:** Roof framing members shall be in accordance with the applicable construction guidelines adopted by the Texas Department of Insurance. The roof framing members shall not be spaced greater than 24 inches on center. The roof deck shall be solidly sheathed with wood structural panels. The minimum thickness and application of the roof sheathing to the roof framing members shall be in accordance with the applicable construction guidelines adopted by the Texas Department of Insurance.

#### 30/90 hot mop underlayment installation

The 30/90 hot mop underlayment system shall consist of a base ply and a top ply.

**Base ply:** The base ply of the underlayment system shall be a No. 30 ASTM D226 anchor sheet. The base ply shall be applied with minimum 3 inch head laps and minimum 6 inch side laps. The base ply shall be fastened to the wood roof deck with minimum 11 gauge (minimum 0.120 inch shank diameter) corrosion resistant roofing nails (smooth or deformed shank) and minimum  $1\frac{5}{8}$  inch diameter tin caps. The fasteners for the base ply shall be applied as specified below:

**Inland II Zone:** Two rows of fasteners spaced 12 inches on center shall be provided in the field and one row of fasteners spaced 6 inches on center shall be provided at the laps. The fasteners shall be of sufficient length to either penetrate the roof deck a minimum of  $\frac{3}{4}$  inches or through the thickness of the roof deck, whichever is less. The base ply shall be applied with minimum 2 inch head laps and minimum 6 inch side laps.

**Inland I Zone:** Two rows of fasteners spaced 12 inches on center shall be provided in the field and one row of fasteners spaced 6 inches on center shall be provided at the laps. For locations 4 ft or less from the edge of the roof and 4 ft or less from the ridge, provide two rows of fasteners spaced 6 inches on center in the field. The fasteners shall be of sufficient length to either penetrate the roof deck a minimum of  $\frac{3}{4}$  inches or through the thickness of the roof deck, whichever is less. The base ply shall be applied with minimum 2 inch head laps and minimum 6 inch side laps.

### 30/90 hot mop underlayment installation (Continued)

**Seaward Zone:** Two rows of fasteners spaced 12 inches on center shall be provided in the field and one row of fasteners spaced 6 inches on center shall be provided at the laps. For locations 4 ft or less from the edge of the roof and 4 ft or less from the ridge, provide two rows of fasteners spaced 6 inches on center in the field. The fasteners shall be of sufficient length to either penetrate the roof deck a minimum of  $\frac{3}{4}$  inches or through the thickness of the roof deck, whichever is less. The base ply shall be applied with minimum 2 inch head laps and minimum 6 inch side laps. **NOTE:** For buildings with a mean roof height greater than 27 ft, deformed shank fasteners shall be used.

**Top ply:** The top ply of the underlayment system shall consist of one layer of No. 90 ASTM D249 mineral surfaced roll roofing. The top ply shall be applied over the base ply by first adhering the top ply to the base ply with a full mopping of ASTM D312 Type IV asphalt. Side laps shall be minimum 6 inches and head laps shall be minimum 3 inches. Next, the top ply shall be backnailed to the base ply with minimum 11 gauge (minimum 0.120 inch shank diameter) deformed shank corrosion resistant nails and minimum  $1\frac{3}{8}$  inch diameter tin caps. The fasteners shall be spaced a maximum of 12 inches o.c. and a minimum of 1 inch from the edge of the top ply.

### Roofing tile installation

The limitations on mean roof height for installing the roofing tiles shall be in accordance with the following guidelines:

**Roof slope limitations:** The roofing tiles shall not be installed on buildings with a roof slope of less than  $2\frac{1}{2}$ :12 and a roof slope greater than 12:12.

**Mean roof height limitations:**

**Inland II Zone:** The roofing tiles shall not be installed on buildings with a mean roof height greater than 50 feet above natural grade.

**Inland I Zone:** The roofing tiles shall not be installed on buildings with a mean roof height greater than 33 feet above natural grade.

**Seaward Zone:** The roofing tiles shall not be installed on buildings with a mean roof height greater than 33 feet above natural grade.

The roof tiles and the underlayment system shall be clean and dry at the time of application.

The roofing tiles shall be adhered to the two-ply 30/90 hot mop underlayment system using the Tile Bond roof tile adhesive in accordance with the Tile Bond Roof Tile Adhesive Operating Instructions and Maintenance Booklet. The roofing tiles must be set within 4 minutes after the adhesive has been dispensed.

**Battens:** The roofing tiles shall be adhered directly to the underlayment system. Battens are permitted but are not required. If battens are used, then the roofing tiles shall not be adhered to the battens. Roofing tiles shall be adhered directly to freshly applied adhesive.

**Adhesive paddies:** A minimum of two paddies shall be installed for each roofing tile. One paddy is placed at the head of the tile and the other paddy is placed at the tail of the tile. Paddies for field tile installations shall be minimum  $1\frac{1}{2}$  inches wide by 4 inches long by 1 inch high. When the paddy is compressed, the contact area should expand to approximately 2 inches by 5 inches. A minimum contact area of approximately 10 square inches per paddy is required. At least one tile per square shall be pulled up to confirm contact area. A brief overview of the installation instructions for flat/low profile, medium profile, and high profile roofing tiles is presented below:

### Roofing tile installation (Continued)

#### Flat/Low profile roofing tiles:

**Field tile installation requirements:** Apply the first adhesive pad, approximately 1 ½ inches wide by 4 inches long by 1 inch high, directly onto the head lap of the preceding course on the overlock side of the tile.

Apply the second pad, approximately 1 ½ inches wide by 4 inches long by 1 inch high, directly onto the cap sheet diagonally across from the first pad. Be sure that the anchor lug and a portion of the pan are embedded in the adhesive. Maximize the contact area to the anchor lug by adjusting the adhesive pad location.

When setting the tile, angle the tile forward past the adhesive pad and drag the tile into the adhesive before setting it down. This prevents the adhesive from being exposed on the face of the previous course.

**Eave, hip, and ridge tile installation requirements:** Eave, hip, and ridge tiles shall be installed in accordance with the Tile Bond Roof Tile Adhesive Operating Instructions and Maintenance Booklet, as revised October 1997.

**Paddy placement details:** Refer to the Tile Bond Roof Tile Adhesive Operating Instructions and Maintenance Booklet as revised October 1997 for the proper placement of adhesive paddies.

#### Medium profile roofing tiles:

**Field tile installation requirements:** Apply the first adhesive pad, approximately 1 ½ inches wide by 4 inches long by 1 inch high, directly onto the head lap of the preceding course on the overlock side of the tile.

Apply the second pad, approximately 1 ½ inches wide by 4 inches long by 1 inch high, directly onto the cap sheet diagonally across from the first pad. Be sure that the anchor lug and a portion of the pan are embedded in the adhesive. Maximize the contact area to the anchor lug by adjusting the adhesive pad location.

When setting the tile, angle the tile forward past the adhesive pad and drag the tile into the adhesive before setting it down. This prevents the adhesive from being exposed on the face of the previous course.

**Eave, hip, and ridge tile installation requirements:** Eave, hip, and ridge tiles shall be installed in accordance with the Tile Bond Roof Tile Adhesive Operating Instructions and Maintenance Booklet.

**Paddy placement details:** Refer to the Tile Bond Roof Tile Adhesive Operating Instructions and Maintenance Booklet as revised October 1997 for the proper placement of adhesive paddies.

#### High profile roofing tiles:

**Field tile installation requirements:** Apply the first adhesive pad, approximately 1 ½ inches wide by 4 inches long by 1 inch high, directly onto the valley portion of the head lap of the preceding course.

Apply the second pad, approximately 1 ½ inches wide by 4 inches long by 1 inch high, at head of tile directly onto the cap sheet. Be sure that the anchor lug and a portion of the pan are embedded in the adhesive. Both adhesive pads should be on the same underlock side of the tile. Maximize the contact area to the anchor lug by adjusting the adhesive pad location.

**Roofing tile installation (Continued)**

**High profile roofing tiles (Continued):**

**Eave, hip, and ridge tile installation requirements:** Eave, hip, and ridge tiles shall be installed in accordance with the Tile Bond Roof Tile Adhesive Operating Instructions and Maintenance Booklet.

**Paddy placement details:** Refer to the Tile Bond Roof Tile Adhesive Operating Instructions and Maintenance Booklet as revised October 1997 for the proper placement of adhesive paddies.

**Additional attachment requirements for roofing tiles:** For roof slopes 6:12 up to and including 7:12, every third tile in every fifth course shall be fastened with a single corrosion resistant fastener in addition to the adhesive. For roof slopes greater than 7:12, every tile shall be fastened with a single corrosion resistant fastener in addition to the adhesive. The fasteners shall be of sufficient size to hold the tile in place until the adhesive has cured. Flashing cement shall be applied to seal all fastener penetrations.

**Note:** The Tile Bond Roof Tile Adhesive Operating Instructions and Maintenance Booklet, as revised October 1997, shall be available on the job site during the roof tile installation. All fasteners shall be corrosion resistant as specified in the Texas Department of Insurance Windstorm Resistant Construction Guide or the Texas Windstorm Insurance Association Building Code for Windstorm Resistant Construction.