# Product Evaluation



*The following product has been evaluated for compliance with the wind loads specified in the International Residential Code (IRC) and the International Building Code (IBC).*

*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 design wind load criteria in Chapter 3 of the IRC and Section 1609 of the IBC. The design loads determined for the building or structure shall not exceed the design load rating specified for the products shown in the limitations section of this product evaluation. This product evaluation does not relieve a Texas licensed engineer of his responsibilities as outlined in the Texas Insurance Code, the Texas Administrative Code, and the Texas Engineering Practice Act.*

*For more information, contact TDI Engineering Services Program at (800) 248-6032.*

**Evaluation ID:** RC-439

**Effective Date:** April 1, 2015
**Re-evaluation Date:** January 2018

**Product Name:** Danish Clay Roofing Tiles

**Manufacturer:** Laminados de Barro S. A. de C. V.
Av. Rio Escondido #500
Col. El Vergel
Piedras Negras, Coahuila
Mexico 26070
52.878.783.4444

**General Description:**
The Danish Clay Roof Tiles are machine-formed, smooth-finished roof tiles that are made from natural clay and are available in a variety of colors. The tiles are notched and angled at opposite corners to facilitate installation. A single fastener hole is located near the high-side edge.

**Roof Tile Dimensions:** The dimensions of the Danish Clay Roof Tile that apply to this product evaluation report are specified in Table 1.

**Table 1: Roof Tile Dimensions**

| Tile Designation | Width | Length | Thickness |
|---|---|---|---|
| Danish Tile | 9-5/8" | 15-7/8" | 7/16" |

**Steel Clips:** The steel clips are custom manufactured. The clips are 1-5/8" long and 1/2" wide with two-fastener holes. The clips are manufactured of either galvanized steel or Type 304 stainless steel.

**Limitations:**
**Roof Slope Limitations:** Only install the roof tiles on buildings with a roof slope greater than or equal to 3:12, but not exceeding 12:12. Table 2 specifies the specific roof slope limitations.

**Mean Roof Height Limitations:** The mean roof height limitations shall be as specified in Table 2. The roof tiles shall not be installed on buildings with a mean roof height greater than 60 feet.

**Table 2: Mean Roof Height Limitations** [2]
**Gable and Hip Roofs - Roof Slope: ≥ 3:12 and ≤ 12:12**

| Mean Roof Height Limitation | | | | | |
|---|---|---|---|---|---|
| Inland II | | Inland I | | Seaward | |
| Exposure B [1] | Exposure C [1] | Exposure B [1] | Exposure C [1] | Exposure B [1] | Exposure C [1] |
| 60' | 60' | 60' | 60' | 60' | 60' |

Note: [1] The Exposure category for the structure location shall be as defined in either the IRC or the IBC.
[2] Table is based on an Importance factor of 1.0

**Roof Framing and Roof Deck:** The roof framing materials and connections shall comply with the wind load provisions of either the IRC or the IBC. The roof-framing member spacing shall not exceed 24" on center.

Solidly sheath the roof deck with minimum 15/32" plywood decking. Fasten the roof deck to the roof-framing members in accordance with the wind uplift requirements as stipulated by the IRC or the IBC.

If the existing roof frame consists of spaced boards, then a solid deck shall be constructed using one of the following two options: (1) remove and replace the spaced boards with a plywood deck (15/32" minimum thickness); or (2) cover the spaced boards with a plywood deck (15/32" minimum thickness). Fasten the wood structural panel deck over the spaced boards in accordance with the wind uplift requirements as stipulated by the IRC or the IBC.

**Metal drip edge:** Fasten a metal drip edge to the roof deck with either 11-gauge or 12-gauge roofing nails spaced a maximum of 10" on center. Fasten the underlayment and the drip edge with the same fastener. Use the more stringent fastener pattern.

At the eaves, fasten the drip edge directly to the deck and apply the underlayment over the drip edge. At the gable ends, apply the drip over the underlayment.

**Roof Underlayment:**

**Roof Slope ≥ 3:12 and < 4:12:** Use two layers of underlayment complying with ASTM D 226, Type II (No. 30 asphalt felt) or equivalent. Install the underlayment as specified in either the 2006 IRC (Section R905.3.3.1) or the 2006 IBC (Section 1507.3.3.1) and the manufacturer's installation instructions.

**Roof Slope ≥ 4:12:** At minimum, use one layer of underlayment complying with ASTM D 226, Type II (No. 30 asphalt felt) or equivalent. Lap the underlayment a minimum of 2" at the head laps and a minimum of 6" at the side laps. Install the underlayment as specified in either the 2006 IRC (Section R905.3.3.2) or the 2006 IBC (Section 1507.3.3.2) and the manufacturer's installation instructions.

**Battens:** Install the battens over the underlayment. The battens shall, at minimum, consist of nominal 1x2 Southern Yellow Pine wood members. Fasten the battens to the roof deck with stainless steel screws (minimum No. 8 x 2-1/2"). Use fasteners long enough to penetrate a minimum of 3/4" into (or through) the roof deck.

**Roof Tile Installation Instructions**
**General:**

- The roof tiles and the underlayment system must be clean and dry at the time of application.
- Secure the Danish clay roof tiles to the roof deck over battens. If battens are used, then the fasteners must penetrate through the battens and into the roof deck.
- Install the roof tiles in accordance with this product evaluation report and the manufacturer's installation instructions.

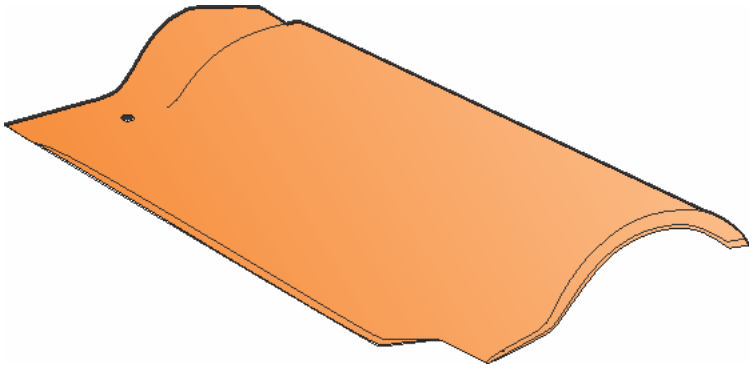
**Roof Tile Fasteners:** Mechanically fasten the roof tiles to the roof deck. At a minimum, use No. 8 x 2-1/2" stainless steel screws. Otherwise, screws must be of sufficient length to penetrate at least 3/4" into (or through) the plywood deck.

**Steel Clip Fasteners**: At a minimum, use No. 6 x 1-5/8" stainless steel screws. Otherwise, use clip screws long enough to penetrate at least 3/4" into (or through) the plywood deck.

**Application:** Lay out the roof tiles from the right to the left, starting at the right rake/hip edge. Install the roof tiles with a 3" headlap and a 1-1/4" sidelap. Fasten the tiles' upper (high-side) section with a single No. 8 x 2-1/2" screw driven through the fastener hole. Secure the tiles with a steel clip that is hooked over the flat, overlapped side (or left-hand side). Set the clips 5-1/2" (on-center) from the bottom (i.e. low-side) edge of the tile. Secure the clips to roof deck with a minimum of one #6 x 1-5/8" wood screw through the hole closest to the edge of the tile. Do not over tighten the screws.

**Rake Tiles, Hip Tiles, and Ridge Tiles:** Refer to the roofing tile manufacturer's installation instructions for the installation of the rake, hip, and ridge tiles.

**Note:** Keep the manufacturer's installation instructions at the job site during installation. Use corrosion resistant fasteners as specified in the IRC the IBC, and the Texas Revisions.



Danish Tile