



BORAL ROOFING
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CONCRETE ROOF TILES

CSI Section:
07 32 16 Concrete Roof Tiles

1.0 RECOGNITION

Boral Roofing Concrete Roof Tiles recognized in this report have been evaluated for use as concrete roof tiles. The weather resistance, wind uplift resistance and fire classification properties of the roof tiles comply with the intent of the provisions of the following codes and regulations:

- 2018, 2015, 2012, 2009, and 2006 International Building Code® (IBC)
- 2018, 2015, 2012, 2009, and 2006 International Residential Code® (IRC)
- 2019 California Building Code (CBC) –Supplement attached
- 2019 California Residential Code (CRC) – Supplement attached
- 2020 Florida Building Code, Building (FBC, Building) – Supplement attached
- 2020 Florida Building Code, Residential (FBC, Residential) – Supplement attached

2.0 LIMITATIONS

Use of the Boral Roofing Concrete Roof Tiles recognized in this report is subject to the following limitations:

2.1 The roof tiles shall be manufactured, identified and installed in accordance with this report and the applicable code. In the event of a conflict this report governs.

2.2 Boral Roofing “concrete roof tile shall be installed on roof slopes of 2½ units vertical in 12 units horizontal (21-percent slope) or greater.” IBC Section 1507.3.2.

2.3 The supporting structure shall be designed to support the loads and is beyond the scope of this report.

2.4 The Concrete Roof Tiles recognized in this report are manufactured in Lake Wales, FL; Brookshire, TX; Phoenix, AZ; Henderson, NV; Okeechobee, FL; Rialto, CA; French Camp, CA; Henderson, CO and Lathrop, CA; Tables 2 A through 2 I describe the tiles produced at each location.

3.0 PRODUCT USE

3.1 General: Boral Roofing Concrete Roof Tiles shall be used as a roof covering in accordance with IBC Section 1503 or IRC Section 903, as applicable.

3.2 Installation:

3.2.1 Installation in accordance with the 2018 IBC or IRC: Boral Concrete Roof Tiles shall be installed in accordance with 2018 IBC Section 1507.3 or 2018 IRC Section R905.3, including the attachment requirements of 2018 IBC Section 1507.3.7 or 2018 IRC Section R905.3.7, as applicable. Underlayment shall conform to 2018 IBC Section 1507.1.1 or 2018 IRC Section R905.1.1. Installation of accessory tiles, EnviroPro® see section 4.1.1.

3.2.2 Installation in accordance with the 2015, 2012, 2009, or 2006 IBC or IRC: Boral Concrete Roof Tiles shall be fastened in accordance with the code specific requirements in Table 1 of this report using The Concrete and Clay Roof Tile Installation Manual for Moderate Climate Regions, dated July 2015, published by the Tile Roofing Institute and the Western States Roofing Contractors Association. The July 2015 TRI manual is associated with ER-2015 in the UES Evaluation Report Directory and available for download at www.uniform-es.org. Installation of accessory tiles, EnviroPro® see section 4.1.1.

TABLE 1 – ATTACHMENT DESIGN

Applicable Code	Criteria for Applicability	Design Information Location
2015 or 2012 IBC	Ultimate Design Wind Speeds (V_{ult}) \leq 130 MPH and Mean Roof Height \leq 60 feet	Roof Tile Installation Manual & Table 1507.3.7 of the applicable IBC
2009 or 2006 IBC	Basic Wind Speed (3 sec gust) \leq 100 mph and Mean Roof Height \leq 60 feet	
2015, 2012, 2009 or 2006 IRC	Mean Roof Height \leq 40 feet	Roof Tile Installation Manual & Section R905.3.7

For SI: 1 foot = 305 mm, 1 mph = 1.6 m/s

3.3 Anchoring: Boral Concrete Roof tiles may be anchored using mortar in accordance with the applicable building code and, where permitted, the TRI Manual or adhesively attached in accordance with the adhesive manufacturer’s research report issued by an approved evaluation service agency.



4.0 PRODUCT DESCRIPTION

Boral Roofing Concrete Roof Tiles comply with ASTM C1492 as required by Section 1507.3.5 of the IBC. The roof tiles are described by model, weight, dimensions, and tile factor in Tables 2 A through 2 I, for each of the production locations listed in Section 2.4 of this report. When installed in accordance with this report on minimum 15/32-inch-thick (12 mm) plywood solid sheathing or non-combustible decks, the assembly incorporating the roof tiles achieve an ASTM E108 Class A rating per Section 1505.2 of the IBC and Section R902.1 of the IRC, as applicable. Roof classifications for adhesively attached systems shall be in accordance with the adhesive manufacturer's approved research report.

4.1 Accessories:

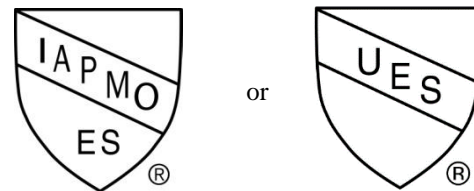
Boral EnviroPro[®] recognized in this report has been evaluated for use as an accessory product to be used with concrete roof tiles. The weather resistance, wind uplift resistance and fire classification properties of the product complies with the intent of the provisions of the codes and regulations in Section 1.0 of this report. The Boral EnviroPro product is subject to all limitations in Section 2.0 of this report. The Boral EnviroPro product complies with ASTM C1492 as required by Section 1507.3.5 of the IBC. The Boral EnviroPro product is described by model, weight, dimensions, and tile factor in Tables 2 A through 2 I, for each of the production locations listed in Section 2.4 of this report. When installed in accordance with this report on minimum 15/32-inch-thick (12 mm) plywood solid sheathing or non-combustible decks, the assembly incorporating the Boral EnviroPro product achieves an ASTM E108 Class A rating per Section 1505.2 of the IBC and Section R902.1 of the IRC, as applicable.

4.1.1 Installation:

The Boral EnviroPro accessory product shall be limited to installation where roof tiles must be cut, such as in valleys and boundary edges at rakes, walls, chimneys, skylights, and other roof openings and penetrations. The installed dry weight of Boral EnviroPro is equivalent to that of the tile profile in Tables 2A-2I with which it is used.

5.0 IDENTIFICATION

Shipping pallets are identified with the report holder's name (Boral Roofing), manufacturing address, product name, installed weight, inspection agency, and evaluation report number (ER-412). The Cedarlite 600, Madera 700 and Madera 900 tiles are imprinted on the top side of each tile with an "M", all other field tiles are imprinted with the name "Boral", "Boral Lifetile", "Monierlifetile", or the Boral Roofing, or MonierLifetile or "Vostile" or logo. The Boral EnviroPro product shall be clearly identified to provide distinction between field tiles and accessory tiles as stated in the EnviroPro product installation guidelines. The identification includes the IAPMO Uniform Evaluation Service Mark of Conformity. Either Mark of Conformity may be used as follows:



IAPMO UES ER-412

6.0 SUBSTANTIATING DATA

Data in accordance with ICC-ES AC180, dated February 2012 (editorially revised March 2018), manufacturer's descriptive literature and installation instructions. Test reports are from laboratories in compliance with ISO/IEC 17025.

7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research completed by IAPMO Uniform Evaluation Service on Boral Roofing Concrete Roof Tiles to assess conformance to the codes shown in Section 1.0 of this report and serves as documentation of the product certification. Products are manufactured at locations noted in Section 2.4 of this report under a quality control program with periodic inspection under the supervision of IAPMO UES.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org

**Table 2 A - Tiles Manufactured at Denver (Henderson), CO**

Tile	Installed Dry Weight ¹ (psf)	Dimemsions ² (inch)	Tile Factor	
		Length X Width	TF (ft ³)	Ratio ¹
Saxony – Shake, Slate, Country Slate Split Old English Thatch	9.6	17 X 13	1.568	1.115
Saxony – Impact	10.5	17 X 13	1.568	1.115
Villa 900	9.0	17 X 13	1.503	1.068
Villa– Impact	10.1	17 X 13	1.503	1.068

For SI: 1 inch = 25.4 mm, 1 psf = 4.88 kg/m²**Table 2 B - Tiles Manufactured at Henderson, NV**

Tile	Installed Dry Weight ¹ (psf)	Dimemsions ² (inch)	Tile Factor	
		Length X Width	TF (ft ³)	Ratio ¹
Espana / Barcelona	9.0	17 X 12 ³ / ₈	1.470	1.045
Saxony 900 – Shake, Slate, Country Slate	9.1	17 X 13	1.533	1.090

For SI: 1 inch = 25.4 mm, 1 psf = 4.88 kg/m²**Table 2 C - Tiles Manufactured at Katy (Brookshire), TX**

Tile	Installed Dry Weight ¹ (psf)	Dimemsions ² (inch)	Tile Factor	
		Length X Width	TF (ft ³)	Ratio ¹
Barcelona – Impact	10.3	16½ X 13	1.444	1.027
Saxony – Country Shake, Country Slate, Country Split Shake, English Thatch	10.3	16½ X 13	1.392	0.989
Saxony – Impact	10.5	16½ X 13	1.392	0.989
Saxony – Shake, Slate	10.3	16½ X 13	1.392	0.989
Tejas Espana / Barcelona	9.0	16½ X 13	1.407	1.000
Villa	9.0	16½ X 13	1.407	1.000

For SI: 1 inch = 25.4 mm, 1 psf = 4.88 kg/m²

NOTES TO TABLES:

1. Used on a 3-inch head-lap.
2. Nominal dimension.

**Table 2 D - Tiles Manufactured at Lake Wales, FL**

Tile	Installed Dry Weight ¹ (psf)	Dimemsions ² (inch)	Tile Factor	
		Length X Width	TF (ft ³)	Ratio ¹
Barcelona 900	9.5	17 X 13	1.525	1.084
Saxony 900 – Shake, Slate, Split Shake, Country Slate	9.5	17 X 13	1.545	1.098
Spanish “S” Nuevo	9.9	17 X 9 ³ / ₄	1.144	0.813
Villa 900	9.2	17 X 13	1.533	1.090

For SI: 1 inch = 25.4 mm, 1 psf = 4.88 kg/m²**Table 2 E - Tiles Manufactured at Lathrop, CA**

Tile	Installed Dry Weight ¹ (psf)	Dimemsions ² (inch)	Tile Factor	
		Length X Width	TF (ft ³)	Ratio ¹
Barcelona 900	9.3	17 X 13	1.509	1.073
Saxony 900 – Shake, Slate	9.1	17 X 13	1.533	1.090

For SI: 1 inch = 25.4 mm, 1 psf = 4.88 kg/m²**Table 2 F - Tiles Manufactured at Phoenix, AZ**

Tile	Installed Dry Weight ¹ (psf)	Dimemsions ² (inch)	Tile Factor	
		Length X Width	TF (ft ³)	Ratio ¹
Mission S / Barcelona	10.3	16½ X 13	1.494	1.062
Saxony – Shake, Slate	9.5	16½ X 13	1.494	1.062
Villa	9.0	16½ X 13	1.407	1.000

For SI: 1 inch = 25.4 mm, 1 psf = 4.88 kg/m²**Table 2 G - Tiles Manufactured at Okeechobee, FL**

Tile	Installed Dry Weight ¹ (psf)	Dimemsions ² (inch)	Tile Factor	
		Length X Width	TF (ft ³)	Ratio ¹
Bermuda	12.44	16 ¹ / ₈ X 10 ¹ / ₈	1.036	0.736
Estate “S”	7.9	16½ X 13	1.417	1.007
Galena Spanish “S”	9.3	17 X 10	1.144	0.831
Plantation	10.4	16½ X 13	1.426	1.014
Saxony 900	9.3	17 X 13	1.533	1.090

For SI: 1 inch = 25.4 mm, 1 psf = 4.88 kg/m²

NOTES TO TABLES:

- Used on a 3-inch head-lap.
- Nominal dimension.



Table 2 H - Tiles Manufactured at Rialto, CA

Tile	Installed Dry Weight ¹ (psf)	Dimemnsions ² (inch)	Tile Factor	
		Length X Width	TF (ft ³)	Ratio ¹
Espana / Barcelona	9.0	17 X 12 ³ / ₈	1.454	1.033
Espana 600 / Barcelona 600	5.9	17 X 12 ³ / ₈	1.454	1.033
Saxony 600 - Slate, Shake, Split Shake	5.9	17 X 13	1.533	1.090
Saxony 700 – Slate, Shake, Split Shake	7.1	17 X 13	1.533	1.090
Saxony 900 - Slate, Shake, Country Shake	9.3	17 X 13	1.533	1.090
Villa 600	5.8	17 X 13	1.494	1.061
Villa 900	9.0	17 X 13	1.494	1.061

For SI: 1 inch = 25.4 mm, 1 psf = 4.88 kg/m²

Table 2 I - Tiles Manufactured at Stockton (French Camp), CA

Tile	Installed Dry Weight ¹ (psf)	Dimemnsions ² (inch)	Tile Factor	
		Length X Width	TF (ft ³)	Ratio ¹
Cedarlite 600	5.9	13½ X 13	0.942	0.673
Madera 700	7.2	13½ X 13	0.947	0.673
Madera 900	9.5	13½ X 13	0.947	0.673
Saxony 600 – Slate, Shake, Split Shake	5.7	17 X 13	1.525	1.084
Saxony 700 – Slate, Shake, Split Shake	7.2	17 X 13	1.525	1.084
Saxony 900 – Hartford Slate, Shake, Slate, Country Slate	9.1	17 X 13	1.533	1.090
Saxony 900 – Split Old English Thatch	9.8	17 X 13	1.525	1.084
Villa 600	6.0	17 X 13	1.494	1.115
Villa 900	9.3	17 X 13	1.494	1.115

For SI: 1 inch = 25.4 mm, 1 psf = 4.88 kg/m²

NOTES TO TABLES:

1. Used on a 3-inch head-lap.
2. Nominal dimension.



CALIFORNIA SUPPLEMENT

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CONCRETE ROOF TILES

CSI Section:

07 32 16 Concrete Roof Tiles

1.0 RECOGNITION

The Boral Concrete Roof Tiles and accessories evaluated in IAPMO UES ER-412 are satisfactory alternative roof covering materials in accordance with the following codes and regulations:

- 2019 California Building Code (CBC)
- 2019 California Residential Code (CRC)

2.0 PRODUCT USE

2.1 The Boral Roofing concrete roof tiles may be used as a Class A, B, or C roof covering systems complying with Sections 1505.1.1 of the CBC or R902.1.1 of the CRC; Sections 1505.1.2 of the CBC or R902.1.2 of the CRC; or Sections 1505.1.3 of the CBC or R902.1.3 of the CRC, respectively. The design and installation of the Boral Roofing concrete roof tiles shall be in accordance with Sections 1507.3.10 and 1513 CBC or Section 905.3 of the CRC, as applicable, and ER-412.

2.2 Roof Tiles shall be installed in accordance with Sections 3.0 and 4.0 of ER-412 except, where the building official requires conformance to the CBC or CRC, the following shall be substituted:

2.2.1 Underlayment shall conform with CBC Section 1507.1.1 or CRC Section 905.1.1.

2.2.2 Attachment of the concrete roof tiles shall be designed to resist wind loads according to CBC Sections 1507.3.7 and 1609.5 or CRC Section 905.3, as applicable.

2.3 Boral Roofing concrete roof tiles may be used in “new buildings located in any Fire Hazard Severity Zone or any Wildland-Urban Interface Fire Area designated by the enforcing agency constructed after the application date shall comply with the provisions” in accordance with Sections 701A.3 and 705A of the CBC, or Sections R337.1.3.1 and R337.5 of the CRC, as applicable, and with the IBC as presented in ER-412.

2.4 Boral Roofing concrete roof tiles used on structures regulated by the Division of the State Architect or the Office of Statewide Planning and Development are subject to installation provisions in CBC Section 1513.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org



FLORIDA SUPPLEMENT

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CONCRETE ROOF TILES

CSI Section:

07 32 16 Concrete Roof Tiles

1.0 RECOGNITION

The Boral Roofing concrete roof tiles and accessories evaluated in IAPMO UES ER-412 are a satisfactory alternative roof covering materials in accordance with to the following codes and regulations:

- 2020 Florida Building Code, Building (FBC, Building)
- 2020 Florida Building Code, Residential (FBC, Residential)

2.0 LIMITATIONS

2.1 Verification shall be provided that a quality assurance agency audits the manufacturers quality assurance program and audits the production quality of products, in accordance with Section (5)(d) of Florida Rule 61G20-3.008. The quality assurance agency shall be approved by the Commission (or the building official when the report holder does not possess an approval by the Commission).

2.2 Evaluation to the high-velocity hurricane zone provisions in Section 1512 of the FBC, Building and Chapter 44 of the FBC, Residential is beyond the scope of this report.

3.0 PRODUCT USE

The design and installation of the Boral Roofing concrete roof tiles shall be in accordance with the 2018 International Building Code and the 2018 International Residential Code, as applicable, as noted in ER-412. The FBC, Building Section 1507.3 and FBC, Residential Section R905.3 states that the installation of the Boral Roofing concrete roof tiles “shall be in accordance with the requirements of the FRSA/TRI *Florida High Wind Concrete and Clay Roof Tile Installation Manual*, Sixth Edition where the V_{asd} is determined in accordance with” FBC, Building Section 1609.3.1, FBC-Residential Section R301.2.1.3, or the recommendations of RAS 118, 119 or 120. Load

combinations shall be in accordance with Sections 1605.2 or 1605.3 of the FBC, Building, as applicable. Design wind loads shall be in accordance with Section 1609.5 of the FBC, Building or Section R301.2.1 of the FBC, Residential, as applicable.

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