

TEXAS DEPARTMENT OF INSURANCE

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PRODUCT EVALUATION

Effective Date: September 1, 2012

RC-348

*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 shall be subject to reevaluation **June 2016**.*

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.

Duro-Last Duro-Fleece Adhered Single Ply Roofing Systems Installed Over Various Decks,
manufactured by

Duro-Last Roofing, Inc.
525 Morley Drive
Saginaw, Michigan 48601
Telephone: (800) 248-0280

will be accepted in designated catastrophe zones along the Texas Gulf Coast when installed in accordance with the manufacturer's installation instructions and this product evaluation.

PRODUCT DESCRIPTION

Duro-Last DF50 Duro-Fleece Membrane: A nominal 50-mil thick single ply roofing membrane. The membrane is composed of PVC film laminated to both sides of a weft insertion knotted scrim and laminated to a fleece backing.

Duro-Last WB II Adhesive: A polymeric waterborne adhesive used to bond the Duro-Fleece membrane to a variety of substrates.

Duro-Last Duro-Fleece Membrane Adhesive: A two component adhesive used for adhering the Duro-Fleece membrane to a variety of substrates.

Insulation: A polyisocyanurate foam insulation or a polystyrene rigid cellular foam insulation. Insulation shall comply with ASTM C 1289 or ASTM C 578.

Duro-Last #14 HD Fasteners: Fasteners are No. 14 diameter, threaded screws with drill points and truss heads.

Duro-Last #15 Fasteners: Fasteners are No. 15 diameter, threaded screws with drill points and truss heads.

Duro-Last 3 inch Metal Plate: A 3 inch square, 0.24 inch thick galvalume plate with a 0.25 inch diameter hole located at the center.

LIMITATIONS and INSTALLATION

Roof Framing: Roof framing shall be as specified in each assembly listed in this evaluation report.

Roof Deck: The roof deck shall be secured to the roof framing to resist the required uplift loads as specified in each assembly listed in this evaluation report.

Positive Drainage of Roof Deck: Roof decks, in which this product is to be installed upon, shall be provided with positive drainage. A minimum roof slope after construction of $\frac{1}{4}$ inch per foot is recommended.

Design Wind Pressures: The design wind uplift pressures shall be as specified in the assemblies listed in this evaluation report.

INSTALLATION INSTRUCTIONS

General Installation Requirements: International Residential Code (IRC) and International Building Code (IBC) requirements shall be satisfied and the manufacturer's installation instructions followed, unless otherwise specified by this product evaluation report.

Fasteners: Fasteners shall be of sufficient length to penetrate into and through the steel deck a minimum of $\frac{3}{4}$ inch.

Installation: Installation shall be in accordance with the following assemblies. Refer to the manufacturer's specifications for additional installation requirements.

Assembly No. 1

Design Pressure: -45 psf
Purlins: Minimum $\frac{1}{4}$ inch thick steel
Deck: Minimum 22 gauge, Type B, Grade 80 steel
Attachment: Attached to steel supports spaced a maximum of 72 inches on center with TRAXX/5 screws spaced a maximum of 6 inches on center. Deck sidelaps are secured 24 inches on center with TRAXX/1 screws.
Insulation: Minimum $1\frac{1}{2}$ inches thick ENRGY 3, ISO-95+GL, Multi-Max FA-3, ACFoam-II or Duro-Guard ISO-II-A, ACFoam-III or Duo-Guard ISO-III-A, or minimum 2 inch thick ACFoam IV or Duro-Guard-IV-A. Secured with Duro-Last 3" metal plates with Duro-Last #15 extra heavy duty drill point fasteners installed at 1 per 2 sf.
Adhesive: Duro-Last WB II Adhesive applied at 100 sf/gal.
Membrane: Duro-Fleece, minimum 50-mil thick. Sealed with 3 inch wide laps with a minimum $1\frac{1}{2}$ inch wide heat weld.

Assembly No. 2

Design Pressure: -45 psf
Purlins: Minimum $\frac{1}{4}$ inch thick steel
Deck: Minimum 22 gauge, Type B, Grade 80 steel
Attachment: Attached to steel supports spaced a maximum of 72 inches on center with TRAXX/5 screws spaced a maximum of 6 inches on center. Deck sidelaps are secured 24 inches on center with TRAXX/1 screws.
Roof Board: Minimum $\frac{1}{2}$ inch thick Dens Deck or Securock. Secured with Duro-Last 3" metal plates with Duro-Last #15 extra heavy duty drill point fasteners installed at 1 per 2 sf.
Adhesive: Duro-Last WB II Adhesive applied at 100 sf/gal.

Assembly No. 2 (Continued)

Membrane: Duro-Fleece, minimum 50-mil thick. Sealed with 3 inch wide laps with a minimum 1 ½ inch wide heat weld.

Assembly No. 3

Design Pressure: -45 psf
Purlins: Minimum ¼ inch thick steel
Deck: Minimum 22 gauge, Type B, Grade 80 steel
Attachment: Attached to steel supports spaced a maximum of 72 inches on center with TRAXX/5 screws spaced a maximum of 6 inches on center. Deck sidelaps are secured 24 inches on center with TRAXX/1 screws.
Insulation: Minimum 1 ½ inches thick ENRGY 3, ISO-95+GL, Multi-Max FA-3, ACFoam-II or Duro-Guard ISO-II-A, ACFoam-III or Duro-Guard ISO-III-A, or minimum 2 inch thick ACFoam IV or Duro-Guard ISO-IV-A. Installed loose.
Roof Board: Minimum ¼ inch thick Dens Deck or Securock. Secured with Duro-Last 3" metal plates with Duro-Last #15 extra heavy duty drill point fasteners installed at 1 per 2 sf. Fasteners penetrate through the insulation and into the steel deck.
Adhesive: Duro-Last WB II Adhesive applied at 100 sf/gal.
Membrane: Duro-Fleece, minimum 50-mil thick. Sealed with 3 inch wide laps with a minimum 1 ½ inch wide heat weld.

Assembly No. 4

Design Pressure: -67.5 psf
Purlins: Minimum ¼ inch thick steel
Deck: Minimum 22 gauge, Type B, Grade 80 steel
Attachment: Attached to steel supports spaced a maximum of 72 inches on center with TRAXX/5 screws spaced a maximum of 6 inches on center. Deck sidelaps are secured 24 inches on center with TRAXX/1 screws.
Insulation: Minimum 1 ½ inches thick ENRGY 3, ISO-95+GL, Multi-Max FA-3, ACFoam-II or Duro-Guard ISO-II-A, ACFoam-III or Duro-Guard ISO-III-A, or minimum 2 inch thick ACFoam IV or Duro-Guard ISO-IV-A. Installed loose.
Roof Board: Minimum ¼ inch thick Dens Deck or Securock. Secured with Duro-Last 3" metal plates with Duro-Last #14 fasteners installed at 1 per 1.33 sf. Fasteners penetrate through the insulation and into the steel deck.
Adhesive: Duro-Last WB II Adhesive applied at 100 sf/gal.
Membrane: Duro-Fleece, minimum 50-mil thick. Sealed with 3 inch wide laps with a minimum 1 ½ inch wide heat weld.

Assembly No. 5

Design Pressure: -37.5 psf
Purlins: Minimum ¼ inch thick steel
Deck: Minimum 22 gauge, Type B, Grade 80 steel
Attachment: Attached to steel supports spaced a maximum of 72 inches on center with TRAXX/5 screws spaced a maximum of 6 inches on center. Deck sidelaps are secured 24 inches on center with TRAXX/1 screws.

Assembly No. 5 (Continued)

- Concrete: Filler layer of Celcore MF cellular concrete with Celcore HS Rheology modifying admixture cast to $\frac{1}{8}$ inch above the deck ribs with a minimum wet cast density of 36 pcf. The Celcore HS admixture is added to the mixture during the mixing process at a rate of 3.4 fl oz per 100 lbs.
- Insulation: 1 layer of 1" thick 1 pcf density Holyboard EPS roof insulation board with 8 holes per board set into the wet concrete.
- Concrete: 2 inch thick Celcore MF cellular concrete with Celcore HS admixture poured with a wet cast density of 45.6 pcf. The Celcore admixture is added to the top coat at the rate of 3.4 fl oz per 100 lbs. Celcore PVA curing compound is spray applied over the top coat at a rate 0.33 gal/100 sf.
- Adhesive: Duro-Fleece Adhesive applied to the cellular concrete in $\frac{3}{4}$ inch wide ribbons installed 6 inches on center.
- Membrane: Duro-Fleece, minimum 60-mil thick. Sealed with 3 inch wide laps with a minimum $1\frac{1}{2}$ inch wide heat weld.

Assembly No. 6

- Design Pressure: -60 psf
- Purlins: Minimum $\frac{1}{4}$ inch thick steel
- Deck: Minimum 22 gauge, Type B, Grade 80 steel
Attachment: Attached to steel supports spaced a maximum of 72 inches on center with TRAXX/5 screws spaced a maximum of 6 inches on center. Deck sidelaps are secured 24 inches on center with TRAXX/1 screws.
- Concrete: Filler layer of Celcore MF cellular concrete with Celcore HS Rheology modifying admixture cast to $\frac{1}{8}$ inch above the deck ribs with a minimum wet cast density of 36 pcf. The Celcore HS admixture is added to the mixture during the mixing process at a rate of 3.4 fl oz per 100 lbs.
- Insulation: 1 layer of 1" thick 1 pcf density Holyboard EPS roof insulation board with 8 holes per board set into the wet concrete.
- Concrete: 2 inch thick Celcore MF cellular concrete with Celcore HS admixture poured with a wet cast density of 45.6 pcf. The Celcore admixture is added to the top coat at the rate of 3.4 fl oz per 100 lbs. Celcore PVA curing compound is spray applied over the top coat at a rate 0.33 gal/100 sf.
- Adhesive: Duro-Last WB II Adhesive applied at 100 sf/gal.
- Membrane: Duro-Fleece, minimum 60-mil thick. Sealed with 3 inch wide laps with a minimum $1\frac{1}{2}$ inch wide heat weld.

Assembly No. 7

- Design Pressure: -82.5 psf
- Deck: Minimum $3\frac{1}{2}$ inch thick Celcore MF cellular concrete with Celcore HS Rheology modifying admixture.
- Concrete: 2 inch thick Celcore MF cellular concrete with Celcore HS admixture poured with a wet cast density of 45.6 pcf. The Celcore admixture is added to the top coat at the rate of 3.4 fl oz per 100 lbs. Celcore PVA curing compound is spray applied over the top coat at a rate 0.33 gal/100 sf.

Assembly No. 7 (Continued)

Adhesive: Duro-Last WB II Adhesive applied at 100 sf/gal.
Membrane: Duro-Fleece, minimum 60-mil thick. Sealed with 3 inch wide laps with a minimum 1 ½ inch wide heat weld.

Assembly No. 8

Design Pressure: -232.5 psf
Deck: Minimum 3 ½ inch thick Celcore MF cellular concrete with Celcore HS Rheology modifying admixture.
Concrete: 2 inch thick Celcore MF cellular concrete with Celcore HS admixture poured with a wet cast density of 45.6 pcf. The Celcore admixture is added to the top coat at the rate of 3.4 fl oz per 100 lbs. Celcore PVA curing compound is spray applied over the top coat at a rate 0.33 gal/100 sf.
Adhesive: Duro-Fleece Adhesive applied at 1 inch wide ribbons spaced 4 inches on center. Beads are allowed to expand to full coverage prior to placement of the roof cover.
Membrane: Duro-Fleece, minimum 60-mil thick. Sealed with 3 inch wide laps with a minimum 1 ½ inch wide heat weld.

Note: The manufacturer's installation instructions shall be on the job site during the installation. All fasteners shall be corrosion resistant as specified in the International Residential Code (IRC), the International Building Code (IBC), and the Texas Revisions.