

UL Evaluation Report



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DIVISION: 07 00 00 THERMAL AND MOISTURE PROTECTION
Sub-level 2: 07 50 00 – Membrane Roofing
Sub-level 3: 07 54 00 – Thermoplastic Membrane Roofing
Sub-level 4: 07 54 23 – Thermoplastic-Polyolefin Roofing

COMPANY:

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1. SUBJECT: EverGuard® TPO, EverGuard Extreme® TPO

EverGuard® TPO FB Ultra, EverGuard Extreme® TPO FB Ultra

EverGuard® Freedom™ TPO HW, EverGuard® Freedom™ TPO with RapidSeam™
Technology

2. SCOPE OF EVALUATION

- 2015, 2012, 2009 and 2006 *International Building Code*® (IBC)
- 2015, 2012, 2009 and 2006 *International Residential Code*® (IRC)
- ICC ES Acceptance Criteria for Roof-Covering Systems (AC75), Dated July 2010
- ICC ES Acceptance Criteria for Quality Documentation (AC10), Dated June 2014

The products were evaluated for the following properties:

- Roofing Systems for Exterior Fire Exposure (ANSI/UL 790, ASTM E108)
- Roofing Systems, Wind Uplift Resistance (FM 4474)
- Physical Properties (ASTM D6878, ASTM G155)
- Impact Resistance (FM 4470)
- Foot Traffic Resistance (FM 4470)

3. REFERENCED DOCUMENTS

- ANSI/UL 790, Standard Test Methods for Fire Tests of Roof Coverings, Eighth Edition including revisions through July 29, 2014
- ASTM D6878-2011a, Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing
- ASTM G155-2005a, Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials
- ASTM E108-2011, Test Methods for Fire Tests of Roof Covering
- FM 4470-1992, Single-Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for use in Class 1 and Noncombustible Roof Deck Construction
- FM 4474-2004, Evaluating the Simulated Wind Uplift Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures
- ICC ES Acceptance Criteria for Membrane Roof-Covering Systems (AC75), Dated July 2010
- ICC ES Acceptance Criteria for Quality Documentation (AC10), Dated June 2014

4. USES

The TPO membranes described in this report are used as roof coverings in mechanically fastened or fully adhered Class A roof assemblies installed on combustible or non-combustible roof decks.

5. PRODUCT DESCRIPTION

The TPO membrane roofing systems described in this report consist of single-ply roofing membranes, insulation where used, barrier board or slip sheet where used, flashing, mechanical fasteners and adhesives that are installed on a combustible or non-combustible roof deck.

The roofing assemblies incorporating the membranes comply with the following properties when installed as described in this report.

Fire Classification: Roofing assemblies covered under this report have been tested for fire classification Class A in accordance with ANSI/UL790 or ASTM E108, as required by [Section 1505.1](#) of 2015, 2012, 2009 and 2006 IBC and [Section R902.1](#) of the 2015, 2012, 2009 and 2006 IRC.

Wind Uplift Resistance: Roofing assemblies covered under this report have been tested for wind uplift resistance in accordance with FM 4474, and therefore qualify for use under Roofing membranes [Section 1504.3.1](#) of the 2015, 2012, 2009 and 2006 IBC.

The roofing assemblies shall be designed to resist the design wind load pressures for components and cladding in accordance with [Section 1609](#) of the 2015, 2012, 2009 and 2006 IBC and [Section R905.1](#) of the 2015, 2012, 2009 and 2006 IRC.

Physical Properties: The roofing membranes covered under this Report have been tested for physical properties in accordance with ASTM D6878 and ASTM G155, and therefore qualify for use under [Section 1507.13.2](#) and [Section 1504.6](#) of the 2015, 2012, 2009 and 2006 IBC and [Section R905.13.2](#) of the 2015, 2012, 2009 and 2006 IRC.

Impact Test: The single-ply roofing membranes covered under this Report have been tested for impact resistance in accordance with “Resistance to Foot Traffic Test” in Section 5.5 of FM 4470 and therefore qualify for use under [Section 1504.7](#) of the 2015, 2012, 2009 and 2006 IBC.

5.1 Membranes:

- 5.1.1 **EverGuard® TPO:** A nominally 45-, 60- or 80-mil-thick [0.045 inch (1.1 mm), 0.060 inch (1.5 mm) or 0.080 inch (2.0 mm)], thermoplastic polyolefin roof covering with woven polyester reinforcement. The membranes are supplied in rolls 48 inches (1219 mm), 60 inches (1524 mm), 96 inches (2438 mm) or 120 inches (3048 mm) wide by 100 feet (30.5 m) long.
- 5.1.2 **EverGuard® TPO FB Ultra:** A nominally 45-, 60- or 80-mil-thick [0.045 inch (1.1 mm), 0.060 inch (1.5 mm) or 0.080 inch (2.0 mm)], thermoplastic polyolefin roof covering with woven polyester reinforcement and a 3.5 oz/yd² (120 g/m²) polyester fleece fabric backing. The membrane is supplied in rolls 60 inches (1524 mm) or 120 inches (3048 mm) wide. The 45-mil and 60-mil membranes are supplied in 100 foot (30.5 m) long rolls and the 80-mil membranes is supplied in 50 foot (15.2 m) long rolls.
- 5.1.3 **EverGuard Extreme® TPO:** A nominally 50-, 60-, 70- or 80-mil-thick [0.050 inch (1.3 mm), 0.060 inch (1.5 mm), 0.070 inch (1.8 mm), 0.080 inch (2.0 mm)], thermoplastic polyolefin roof covering with woven polyester reinforcement. The membranes are supplied in rolls 60 inches (1524 mm), 96 inches (2438 mm) or 120 inches (3048 mm) wide by 100 feet (30.5 m) long.
- 5.1.4 **EverGuard Extreme® TPO FB Ultra:** A nominally 50-, 60-, 70- or 80-mil-thick [0.050 inch (1.3 mm), 0.060 inch (1.5 mm), 0.070 inch (1.8 mm), 0.080 inch (2.0 mm)], thermoplastic polyolefin roof covering with woven polyester reinforcement and a white polyester fleece fabric backing. The membrane has a white surface and is supplied in rolls 60 inches (1523 mm) or 120 inches (3048 mm) wide. The 50-mil and 60-mil membranes are supplied in 100 foot (30.5 m) long rolls. The 70-mil and 80-mil membranes are supplied in 50 foot (15.20 m) long rolls.
- 5.1.5 **EverGuard® Freedom™ TPO HW:** A nominally 45- or 60-mil-thick [0.045 inch (1.1 mm) or 0.060 inch (1.5 mm)], internally reinforced thermoplastic polyolefin roof covering with a self-adhering backing and a heat weldable seam. The membrane is supplied in rolls 60 inches (1524 mm) or 120 inches (3048 mm) wide by 50 feet (15.2 m) or 100 feet (30.5 m) long.
- 5.1.6 **EverGuard® Freedom™ TPO with RapidSeam™ Technology:** A nominally 45- or 60-mil-thick [0.045 inch (1.1 mm) or 0.060 inch (1.5 mm)], internally reinforced thermoplastic polyolefin roof covering with a self-adhering backing and a self-adhering lap. The membrane is supplied in rolls 60 inches (1524 mm) wide by 50 feet (15.2 m) long.

5.2 Insulation:

Foam plastic insulation when used shall have a flame spread index of not more than 75 when tested at the maximum thickness intended for the use in accordance with ANSI/UL 723 or ASTM E 84 to qualify for use under [Section 2603.3](#) and Exception 3 of the 2015, 2012, 2009 and 2006 IBC. To qualify for use under [Section 2603.4.1.5](#) of the 2015, 2012, 2009 and 2006 IBC, a thermal barrier is not required for foam plastic insulation that is part of a Class A, B or C roof-covering assembly, provided the assembly with foam plastic insulation complies with FM 4450 or UL 1256.

5.3 Fasteners:

Fasteners used to mechanically fasten insulation and membranes to the roof deck, shall be corrosion resistant and shall be one of the fasteners identified in Table 1 through 15 of this Report.

5.4 Adhesive:

The adhesive used to adhere GAF TPO membranes to the insulation or roofing substrate shall be as noted in Table 9, 11, 12, 13, 14, 15 and Appendix A Table 1 and Table 2 of this Report.

6. INSTALLATION

GAF TPO single ply membranes shall be installed in accordance with the applicable code, this report and the manufacturer's published installation instructions. The membranes shall be installed in accordance with [Section 1507.13](#) of the 2015, 2012, 2009 and 2006 IBC or [Section R905.13](#) of the 2015, 2012, 2009 and 2006 IRC as applicable, except as noted in this report.

The manufacturer's published installation instructions shall be available at all times on the jobsite during installation.

The slope of the roof on which the membranes are installed shall be a minimum of 1/4:12 (2% slope) and shall not be more than the maximum slope indicated in the Tables in the Appendix of this Report.

Penetrations and terminations of the roof covering shall be flashed and made watertight in accordance with the requirements of the membrane manufacturer, [Section 1503.2](#) of 2015, 2012, 2009 and 2006 IBC or [Section R903.2](#) of 2015, 2012, 2009 and 2006 IRC and applicable code.

7. Fire Classification

7.1 New Construction: Roof assemblies utilizing GAF EverGuard® TPO thermoplastic single ply roof coverings are described in UL Certification Category for Roofing Systems, ([TGFU](#)), File R1306 and in Tables of this Report.

7.2 Reroofing: The existing roof shall be inspected in accordance with the provisions and limitations of [Section 1510](#) of the 2015, 2012, 2009 and 2006 or [Section R907](#) of the 2015, 2012, 2009 and 2006 IRC, as applicable. The existing deck shall be inspected to verify that the structure to be reroofed is structurally sound and adequate to support and secure the roofing membrane. Prior to installation of new roof coverings, inspection by and approval from the code official having jurisdiction is required.

GAF EverGuard® TPO membranes may be installed over existing Classified Class A roof assemblies as described in the Tables of this Report.

Class A, B or C roof coverings may be installed over existing classified roof assemblies under the following conditions without additional roof classification tests, provided the resulting classification is the lower of the new and existing roof classifications under the following conditions:

- New uninsulated roof coverings installed only over existing uninsulated assemblies.
- New insulated roof coverings installed over existing uninsulated assemblies only.

8. Wind Resistance

- 8.1 New Construction:** The allowable wind uplift pressures for the roof assemblies are noted in the Tables in Appendix of this Report. Metal edge securement for all systems shall be designed in accordance with ANSI/SPRI ES-1, complying with [Section 1504.5](#) of 2015, 2012, 2009 and 2006 IBC. For certifications of metal edge securement systems in accordance with ANSI/SPRI ES-1, See UL Online Certifications Directory Roof-edge Systems, Metal for Use with Low-slope Roofing Systems ([TGJZ](#)).
- 8.2 Reroofing:** Roof covering systems employing mechanical fasteners shall be qualified, to the satisfaction of the code official, as to the adequacy of fasteners penetrating through existing roof coverings into structural substrates. Since the composition and/or conditions of any particular underlying existing roofing materials may vary and reroofing material may vary, reroofing with adhered systems is outside the scope of this report.

9. CONDITIONS OF USE

The GAF single ply roofing membranes described in this Report comply with, or are suitable alternatives to, what is specified in those codes listed in Section 2 of this Report, subject to the following conditions:

- 9.1** Materials and methods of installation shall comply with this Report and the manufacturer's published installation instructions. In the event of a conflict between the installation instructions and this Report, this Report governs.
- 9.2** GAF thermoplastic single ply roofing membranes shall be installed by professional roofing contractors trained and approved by the manufacturer.
- 9.3** See UL Online Certification Directory Roofing Systems ([TGFU](#)) File R1306. Also refer to the Tables of this Report.
- 9.4** Above-deck thermal insulation board shall comply with the applicable standards listed in [Table 1508.2](#) in [Section 1508.2](#) of 2015, 2012, 2009 and 2006 IBC.
- 9.5** Wind uplift pressures on any roof area, including edges and corner zones shall not exceed the allowable wind pressure for the roof covering installed in that particular area. Refer to the Tables of this Report.
- 9.6** The allowable wind uplift pressures listed in the Tables of this Report are for the roof systems only. The deck and framing to which the roofing system is attached shall be designed for the applicable components and cladding, wind loads in accordance with the applicable codes.
- 9.7** When application is over an existing roof, documentation of the wind uplift resistance of the composite roof construction shall be submitted to the code official.

- 9.8** The metal edge securement shall be designed and installed for wind loads in accordance with [Chapter 16](#) of 2015, 2012, 2009 and 2006 IBC and tested for resistance in accordance with Test Methods RE-1, RE-2 and RE-3 of ANSI/SPRI ES-1, except V_{ult} wind speed shall be determined from Figure [1609A](#), [1609B](#), or [1609C](#) of 2015, 2012, 2009 and 2006 IBC as applicable.
- 9.9** The GAF thermoplastic single ply membranes covered under this report are produced under the UL LLC Classification and Follow-Up Service Program, which includes audits in accordance with quality elements of ICC-ES Acceptance Criteria for Quality Documentation, AC10.

10. SUPPORTING EVIDENCE

- 10.1** Data in accordance with ICC-ES Acceptance Criteria for Membrane Roof-Covering Systems, AC75.
- 10.2** Manufacturer's descriptive product literature, including installation instructions.
- 10.3** UL Classification Reports in accordance with ANSI/UL 790. See UL Product Certification Category for Roofing Systems (TGFU), File R1306.
- 10.4** Data in accordance with FM 4474.
- 10.5** Data in accordance with FM 4470.
- 10.6** Data in accordance with ASTM E108, ASTM D6878 and ASTM G155.
- 10.7** Documentation of quality system elements in accordance with ICC-ES Acceptance Criteria for Quality Documentation, AC10.

11. IDENTIFICATION

The GAF thermoplastic single ply membranes described in this evaluation report are identified by a marking bearing the report holder's name (GAF), the plant identification, the product designation, the UL Classification Mark, and the evaluation report number UL ER1306-01. The validity of the evaluation report is contingent upon this identification appearing on the product or UL Classification Mark certificate.

12. USE OF UL EVALUATION REPORT

- 12.1** The approval of building products, materials or systems is under the responsibility of the applicable authorities having jurisdiction.
- 12.2** UL Evaluation Reports shall not be used in any manner that implies an endorsement of the product, material or system by UL.
- 12.3** The current status of this report, as well as a complete directory of UL Evaluation Reports may be found at UL.com via our On-Line Certifications Directory:

www.ul.com/erdirectory

**-Table 1- Wind Resistance and Fire Classification
EverGuard® TPO and EverGuard Extreme® TPO Mechanically Secured to Non-Combustible Roof Deck**

SYSTEM NO.	DECK	THERMAL BARRIER, INSULATION & COVER BOARD		ROOF COVER					FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT	
		Type	Attach.	Membrane	Fasteners and Plates	Min. Lap Width	Min. Weld Width	Max. Lap Spacing			Max. Fastener Spacing
NC-1	Min. 22 ga, type B, Grade 33 steel or min. 2,500 psi concrete	See Note		EverGuard® TPO -OR- EverGuard Extreme® TPO	Drill-Tec™ 2 in. Double Barbed XHD, 2-3/8 in. Barbed XHD or Eyehook AccuSeam Plates and Drill-Tec™ #14 Fasteners (structural concrete deck only) or Drill-Tec™ XHD Fasteners (steel deck only) or Drill-Tec™ Extra Heavy Duty ASAP Assembled Screw and 2-3/8 in. Steel Plate (steel deck only)	6 in.	1.5 in.	114 in.	12 in.	Class A at a max. 1:12 roof incline	-30 psf
NC-2	Min. 22 ga, type B, Grade 33 steel or min. 2,500 psi concrete					6 in.	1.5 in.	114 in.	6 in.		-52.5 psf
NC-3	Min. 22 ga, type B, Grade 33 steel or min. 2,500 psi concrete				Drill-Tec™ 2-3/8 in. Barbed XHD Plates and Drill-Tec™ #14 Fasteners (structural concrete deck only), or Drill-Tec™ XHD Fasteners (steel deck only) or Drill-Tec™ Extra Heavy Duty ASAP Assembled Screw and 2-3/8 in. Steel Plate (steel deck only)	6 in.	1.5 in.	54 in.	18 in.		-30.0 psf
NC-4	Min. 22 ga, type B, Grade 80 steel or min. 2,500 psi concrete					6 in.	1.5 in.	114 in.	12 in.		-37.5 psf
NC-5	Min. 22 ga, type B, Grade 33 steel or min. 2,500 psi concrete				6 in.	1.5 in.	90 in.	6 in.	-60.0 psf		
NC-6	Min. 22 ga, type B, Grade 33 steel or min. 2,500 psi concrete				Drill-Tec™ 2-3/4 in. Double Barbed SXHD Plates and Drill-Tec™ #14 Fasteners (structural concrete deck only) or Drill-Tec™ SXHD Fasteners (steel deck only)	6 in.	1.75 in.	90 in.	18 in.		-30.0 psf

**-Table 1 Continued- Wind Resistance and Fire Classification
EverGuard® TPO and EverGuard Extreme® TPO Mechanically Secured to Non-Combustible Roof Deck**

SYSTEM NO.	DECK	THERMAL BARRIER, INSULATION & COVER BOARD		ROOF COVER						FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT
		Type	Attach.	Membrane	Fasteners and Plates	Min. Lap Width	Min. Weld Width	Max. Lap Spacing	Max. Fastener Spacing		
NC-7	Min. 22 ga., type B, Grade 33 steel	See Note		EverGuard® TPO -OR- EverGuard Extreme® TPO	Drill-Tec™ 2-3/4 in. Double Barbed SXHD Plates and Drill-Tec™ #14 Fasteners (structural concrete deck only) or Drill-Tec™ SXHD Fasteners (steel deck only)	6 in.	1.5 in.	90 in.	12 in.	Class A at a max. 1:12 roof incline	-37.5 psf
NC-8	Min. 22 ga, type B, Grade 80 steel or min. 2,500 psi concrete				Drill-Tec™ 2-3/4 in. Double Barbed SXHD Plates and Drill-Tec™ #14 Fasteners (structural concrete deck only) or Drill-Tec™ SXHD Fasteners (steel deck only)	6 in.	1.5 in.	114 in.	12 in.		-45.0 psf
NC-9	Min. 22 ga, type B, Grade 33 steel or min. 2,500 psi concrete				Drill-Tec™ 2-3/4 in. Double Barbed SXHD Plates and Drill-Tec™ #14 Fasteners (structural concrete deck only) or Drill-Tec™ XHD Fasteners (steel deck only)	6 in.	1.5 in.	114 in.	6 in.		-67.5 psf
THERMAL BARRIER, INSULATION & COVER BOARD NOTE:											
Boards may consist of the following. The boards are preliminarily secured through the top layer and into the roof deck per manufacturer's installation instructions.											
Thermal Barrier (Optional):		Min. 0.5 in. thick Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board, SECUROCK® Glass-Mat Roof Board or ¾ in. thick EnergyGuard™ Perlite Roof Insulation.									
Insulation:		Min. 1.5 in. thick EnergyGuard™ Polyiso Insulation, EnergyGuard™ RA Polyiso Insulation, EnergyGuard™ RN Polyiso Insulation or EnergyGuard™ Ultra Polyiso Insulation.									
Cover Board (Optional):		Min. 0.25 in. thick Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board, SECUROCK® Glass-Mat Roof Board, min. 0.5 in. EnergyGuard™ HD Polyiso Insulation, EnergyGuard™ HD Plus Polyiso Insulation, Structodek® High Density Fiber Board Roof Insulation, EnergyGuard™ Perlite Recover Board or min. 0.75 in. thick EnergyGuard™ Perlite Roof Insulation.									

-Table 2- Wind Resistance and Fire Classification-

EverGuard® TPO and EverGuard Extreme® TPO Mechanically Secured to Non-Combustible Roof Deck with the Drill-Tec™ RhinoBond® Membrane Attachment System (Membrane Bonded to Plate)

SYSTEM NO	DECK	THERMAL BARRIER, INSULATION & COVER BOARD		ROOF COVER (See Note)			FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT
		Type	Attach.	Membrane	Fasteners and Plates	Contributory Area per Fastener		
NC-10	Min. 22 ga, type B, Grade 33 steel or min. 2,500 psi concrete	See Note		EverGuard® TPO -OR- EverGuard Extreme® TPO	Drill-Tec™ RhinoBond® TPO XHD Plates, Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates (see note) and Drill-Tec™ #14 Fasteners (structural concrete deck only) or Drill-Tec™ XHD Fasteners (steel deck only)	5.33 ft ² (6 Fasteners per 48 x 96 in. Board)	Class A at a max. 1:12 roof incline	-45.0 psf
NC-11						2.0 ft ² (8 Fasteners per 48 x 96 in. Board)		-60.0 psf
NC-12						2.67 ft ² (12 Fasteners per 48 x 96 in. Board)		-67.5 psf
ROOF COVER NOTE:								
<p>The membrane is bonded to the Drill-Tec™ RhinoBond® TPO XHD Plates or Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates per manufacturer's installation instructions. The membrane side laps are minimum 3.0 in. wide and are sealed with minimum 1.5 in. wide heat welds.</p> <p>When using the Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates, one must ensure the following:</p> <ul style="list-style-type: none"> • Drill a minimum 5/8 in. dia. pilot hole in the cover board when using a gypsum or wood fiber cover board prior to the installation of the fasteners and plates. • The minimum thickness of board stock [thermal barrier (when present), insulation and cover board (when present)] must be greater than or equal to 2 in. 								
THERMAL BARRIER, INSULATION & COVER BOARD NOTE:								
<p>Boards may consist of the following. The boards are preliminarily secured through the top layer and into the roof deck with the RhinoBond® membrane plates and fasteners applied within the contributory area specifications identified above.</p> <p>Thermal Barrier (Optional): Min. 0.5 in. thick Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board, SECUROCK® Glass-Mat Roof Board or ¾ in. thick EnergyGuard™ Perlite Roof Insulation (Homogeneous).</p> <p>Insulation: Min. 1.5 in. thick EnergyGuard™ Polyiso Insulation, EnergyGuard™ RA Polyiso Insulation, EnergyGuard™ RN Polyiso Insulation or EnergyGuard™ Ultra Polyiso Insulation.</p> <p>Cover Board (Optional): Min. 0.25 in. thick Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board, SECUROCK® Glass-Mat Roof Board, min. 0.5 in. EnergyGuard™ HD Polyiso Insulation, EnergyGuard™ HD Plus Polyiso Insulation or Structodek® High Density Fiber Board Roof Insulation.</p>								

**-Table 3- Wind Resistance and Fire Classification-
EverGuard® TPO and EverGuard Extreme® TPO Mechanically Secured to Insulated Combustible Roof Decks**

SYSTEM NO	DECK	FIRE BARRIER ¹	INSULATION ¹	COVER BOARD ¹	ROOF COVER						FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT
					Membrane	Fasteners and Plates	Min. Lap Width	Min. Weld Width	Max. Lap Spacing	Max. Fastener Spacing		
C-1	Min. 15/32 in. Plywood or 1 in. Wood Plank	VersaShield® Solo™ Fire Resistant Slip Sheet -OR- Min. ¼" thick Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board or	(One or more of the following) Min. 0.5 in. thick EnergyGuard™, EnergyGuard™ RA, EnergyGuard™ RN or EnergyGuard™ Ultra Polyiso Insulation	(Optional) Min. 0.25 in. thick Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board, SECUROCK® Glass-Mat Roof Board, min. 0.5 in. thick EnergyGuard™ HD Polyiso Insulation, EnergyGuard™ HD Plus Polyiso Insulation, Structodek® High Density Fiberboard Roof Insulation, EnergyGuard™ Perlite Recover Board or min. 0.75 in. thick EnergyGuard™ Perlite Roof Insulation	EverGuard® TPO -OR- EverGuard Extreme® TPO	Drill-Tec™ 2 in. Double Barbed XHD, 2-3/8 in. Barbed XHD or Eyehook AccuSeam Plates and Drill-Tec™ #14 Fasteners	6 in.	1.5 in.	54 in.	9 in.	Class A; 0.5:12	-30.0 psf
C-2	Min. 19/32 in. Plywood or 1 in. Wood Plank	SECUROCK® Glass-Mat Roof Board -OR- TOPCOAT® FireOut™ Fire Barrier Coating applied at 1 gal/sq					6 in.	1.5 in.	54 in.	8 in.		-45.0 psf
C-3	Min. 15/32 in. Plywood or 1 in. Wood Plank	Min. ¼" thick Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board or	None	None			6 in.	1.5 in.	54 in.	9 in.	Class A; 2.5:12	-30.0 psf
C-4	Min. 19/32 in. Plywood or 1 in. Wood Plank	SECUROCK® Glass-Mat Roof Board	None	None			6 in.	1.5 in.	54 in.	8 in.		-45.0 psf
C-5	Min. 19/32 in. Plywood or 1 in. Wood Plank	None	(Optional, one or more of the following) Min. 0.5 in. thick EnergyGuard™, EnergyGuard™ RA, EnergyGuard™ RN or EnergyGuard™ Ultra Polyiso Insulation	Min. 0.25 in. thick Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board, SECUROCK® Glass-Mat Roof Board			6 in.	1.75 in.	54 in.	6 in.		-52.5 psf
1) The fire barrier (when present), insulation and cover board (when present) shall be preliminarily secured per manufacturer's installation instructions.												

**-Table 4- Wind Resistance and Fire Classification-
EverGuard® TPO and EverGuard Extreme® TPO Mechanically Secured to Uninsulated Combustible Roof Decks
with the Drill-Tec™ RhinoBond® Membrane Attachment System
(Membrane Bonded to Plate)**

SYSTEM NO	DECK	FIRE BARRIER	ROOF COVER (See Note)		FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT
			Membrane	Fasteners and Plates		
C-6	Min. 15/32 in. Plywood or 1 in. Wood Plank Secured to Structural Lumber Supports Spaced Max. 96 in. o.c.	VersaShield® Solo™ Fire Resistant Slip Sheet -OR- Min. ¼" thick Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board or SECUROCK® Glass-Mat Roof Board (<i>presecured when used with System No. C-6 or C- 7</i>) -OR- TOPCOAT® FireOut™ Fire Barrier Coating applied at 1 gal/sq	EverGuard® TPO -OR- EverGuard Extreme® TPO	Drill-Tec™ RhinoBond® TPO XHD Plates and Drill-Tec™ #14 Fasteners secured 12 in. o.c. into the structural lumber supports (max. 12 x 96 in. grid)	Class A; 2:12 with VersaShield® Solo™ Fire Resistant Slip Sheet -OR- Class A; 2.5:12 with Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board or SECUROCK® Glass- Mat Roof Board -OR- Class A; 0.5:12 with TOPCOAT® FireOut™ Fire Barrier Coating	-30.0 psf
C-7	Min. 15/32 in. Plywood or 1 in. Wood Plank Secured to Structural Lumber Supports Spaced Max. 48 in. o.c.			Drill-Tec™ RhinoBond® TPO XHD Plates and Drill-Tec™ #14 Fasteners secured 24 in. o.c. into the structural lumber supports (max. 24 x 48 in. grid)		-37.5 psf
C-8	Min. 15/32 in. Plywood or 1 in. Wood Plank			Drill-Tec™ RhinoBond® TPO XHD Plates and Drill-Tec™ #14 Fasteners secured into the plywood or wood plank in a 16 x 24 in. grid or at a rate of 12 fasteners per 4 x 8 ft. board (2.67 ft ² per fastener)		-52.5 psf
C-9	Min. 15/32 in. Plywood or 1 in. Wood Plank Secured to Structural Lumber Supports Spaced			Drill-Tec™ RhinoBond® TPO XHD Plates and Drill-Tec™ #14 Fasteners secured 36 in. o.c. into the structural lumber supports (max. 24 x 36 in. grid)		-52.5 psf
C-10	Max. 24 in. o.c.			Drill-Tec™ RhinoBond® TPO XHD Plates and Drill-Tec™ #14 Fasteners secured 24 in. o.c. into the structural lumber supports (max. 24 x 24 in. grid)		-75.0 psf
ROOF COVER NOTE: The membrane is bonded to the Drill-Tec™ RhinoBond® TPO XHD Plates per manufacturer's installation instructions. The membrane side laps are minimum 3.0 in. wide and are sealed with minimum 1.5 in. wide heat welds.						

-Table 5- Wind Resistance and Fire Classification-

EverGuard® TPO and EverGuard Extreme® TPO Mechanically Secured to Insulated Combustible Roof Decks with the Drill-Tec™ RhinoBond® Membrane Attachment System over EnergyGuard™ Polyiso Insulations (Membrane Bonded to Plate)

SYSTEM NO	DECK	FIRE BARRIER	INSULATION	ROOF COVER (See Note)		FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT
				Membrane	Fasteners and Plates		
C-11	Min. 15/32 in. Plywood or 1 in. Wood Plank Secured to Structural Lumber Supports Spaced Max. 96 in. o.c.	VersaShield® Solo™ Fire Resistant Slip Sheet -OR- Min. 0.25 in. thick Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board or SECUROCK® Glass-Mat Roof Board (<i>presecured when used with System No. C-11 or C-12</i>)	(One or more of any of the following) Min. 0.5 in. thick EnergyGuard™, EnergyGuard™ RA, EnergyGuard™ RN, EnergyGuard™ Ultra, EnergyGuard™ HD or EnergyGuard™ HD Plus Polyiso Insulation	EverGuard® TPO -OR- EverGuard Extreme® TPO	Drill-Tec™ RhinoBond® TPO XHD Plates or Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates and Drill-Tec™ #14 Fasteners secured 12 in. o.c. into the structural lumber supports (max. 12 x 96 in. grid)	Class A; 0.5:12	-30 psf
C-12	Min. 15/32 in. Plywood or 1 in. Wood Plank Secured to Structural Lumber Supports Spaced Max.48 in. o.c.				Drill-Tec™ RhinoBond® TPO XHD Plates or Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates and Drill-Tec™ #14 Fasteners secured 24 in. o.c. into the structural lumber supports (max. 24 x 48 in. grid)		-37.5 psf
C-13	Min. 15/32 in. Plywood or 1 in. Wood Plank				Drill-Tec™ RhinoBond® TPO XHD Plates or Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates and Drill-Tec™ #14 Fasteners secured into the plywood or wood plank within a maximum contributory area of 2.67 ft² per fastener (12 fasteners per 48 x 96 in. board)		-52.5 psf
C-14	Min. 15/32 in. Plywood or 1 in. Wood Plank Secured to Structural Lumber Supports Spaced Max. 24 in. o.c.				Drill-Tec™ RhinoBond® TPO XHD Plates or Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates and Drill-Tec™ #14 Fasteners secured 36 in. o.c. into the structural lumber supports (max. 24 x 36 in. grid)		-52.5 psf
C-15	Min. 15/32 in. Plywood or 1 in. Wood Plank Secured to Structural Lumber Supports Spaced Max. 24 in. o.c.				Drill-Tec™ RhinoBond® TPO XHD Plates or Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates and Drill-Tec™ #14 Fasteners secured 24 in. o.c. into the structural lumber supports (max. 24 x 24 in. grid)		-75.0 psf

ROOF COVER NOTE:

The membrane is bonded to the Drill-Tec™ RhinoBond® TPO XHD Plates per manufacturer's installation instructions. The membrane side laps are minimum 3.0 in. wide and are sealed with minimum 1.5 in. wide heat welds. The insulation thickness must be greater than or equal to 2 in. when using Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates.

**-Table 6 - Wind Resistance and Fire Classification-
 EverGuard® TPO and EverGuard Extreme® TPO Mechanically Secured to Insulated Combustible Roof Decks
 with the Drill-Tec™ RhinoBond® Membrane Attachment System over Gypsum Cover Boards
 (Membrane Bonded to Plate)**

SYSTEM NO	DECK	FIRE BARRIER	INSULATION	COVER BOARD	ROOF COVER (See Note)		FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT
					Membrane	Fasteners and Plates		
C-16	Min. 15/32 in. Plywood or 1 in. Wood Plank Secured to Structural Lumber Supports Spaced Max. 96 in. o.c.	None	(Optional, One or more of the following) Min. 0.5 in. thick EnergyGuard™, EnergyGuard™ RA, EnergyGuard™ RN or EnergyGuard™ Ultra Polyiso Insulation	Min. 0.25 in. thick Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board or SECUROCK® Glass-Mat Roof Board (presecured when used with System No. C-16 or C-17)	EverGuard® TPO -OR- EverGuard Extreme® TPO	Drill-Tec™ RhinoBond® TPO XHD Plates or Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates and Drill-Tec™ #14 Fasteners secured 12 in. o.c. into the structural lumber supports (max. 12 x 96 in. grid)	Class A; 2.5:12	-30 psf
C-17	Min. 15/32 in. Plywood or 1 in. Wood Plank Secured to Structural Lumber Supports Spaced Max. 48 in. o.c.					Drill-Tec™ RhinoBond® TPO XHD Plates or Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates and Drill-Tec™ #14 Fasteners secured 24 in. o.c. into the structural lumber supports (max. 24 x 48 in. grid)		-37.5 psf
C-18	Min. 15/32 in. Plywood or 1 in. Wood Plank					Drill-Tec™ RhinoBond® TPO XHD Plates or Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates and Drill-Tec™ #14 Fasteners secured into the plywood or wood plank within a maximum contributory area of 2.67 ft ² per fastener (12 fasteners per 48 x 96 in. board)		-52.5 psf

ROOF COVER NOTE:

The membrane is bonded to the Drill-Tec™ RhinoBond® TPO XHD Plates or Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates per manufacturer's installation instructions. The membrane side laps are minimum 3.0 in. wide and are sealed with minimum 1.5 in. wide heat welds.

When using the Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates, one must ensure the following:

- Drill a minimum 5/8 in. dia. pilot hole in the Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board or SECUROCK® Glass-Mat Roof Board cover board prior to the installation of the fasteners and plates.
- The minimum thickness of board stock (insulation and cover board) must be greater than or equal to 2 in.

**-Table 6 Continued - Wind Resistance and Fire Classification-
 EverGuard® TPO and EverGuard Extreme® TPO Mechanically Secured to Insulated Combustible Roof Decks
 with the Drill-Tec™ RhinoBond® Membrane Attachment System over Gypsum Cover Boards
 (Membrane Bonded to Plate)**

SYSTEM NO	DECK	FIRE BARRIER	INSULATION	COVER BOARD	ROOF COVER (See Note)		FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT
C-19	Min. 15/32 in. Plywood or 1 in. Wood Plank Secured to Structural Lumber Supports Spaced Max. 24 in. o.c.	None	(Optional, One or more of the following) Min. 0.5 in. thick EnergyGuard™, EnergyGuard™ RA, EnergyGuard™ RN or EnergyGuard™ Ultra Polyiso Insulation	Min. 0.25 in. thick Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board or SECUROCK® Glass-Mat Roof Board	EverGuard® TPO -OR- EverGuard Extreme® TPO	Drill-Tec™ RhinoBond® TPO XHD Plates or Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates and Drill-Tec™ #14 Fasteners secured 36 in. o.c. into the structural lumber supports (max. 24 x 36 in. grid)	Class A; 2.5:12	-52.5 psf
C-20						Drill-Tec™ RhinoBond® TPO XHD Plates or Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates and Drill-Tec™ #14 Fasteners secured 24 in. o.c. into the structural lumber supports (max. 24 x 24 in. grid)		-75.0 psf

ROOF COVER NOTE:

The membrane is bonded to the Drill-Tec™ RhinoBond® TPO XHD Plates or Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates per manufacturer's installation instructions. The membrane side laps are minimum 3.0 in. wide and are sealed with minimum 1.5 in. wide heat welds.

When using the Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates, one must ensure the following:

- Drill a minimum 5/8 in. dia. pilot hole in the Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board or SECUROCK® Glass-Mat Roof Board cover board prior to the installation of the fasteners and plates.
- The minimum thickness of board stock (insulation and cover board) must be greater than or equal to 2 in.

**-Table 7- Wind Resistance and Fire Classification-
 EverGuard® Freedom™ TPO HW and EverGuard® Freedom™ TPO with RapidSeam™ Technology Self-Adhered to StormSafe™ Anchor Sheet over Uninsulated
 Combustible Roof Decks**

SYSTEM NO	DECK	FIRE BARRIER	ROOF COVER (See Note)			FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT
			Membrane	Anchor Sheet	Fasteners and Plates		
C-21	Min. 15/32 in. Plywood or 1 in. Wood Plank	VersaShield® Solo™ Fire Resistant Slip Sheet -OR- TOPCOAT® FireOut™ Fire Barrier Coating applied at 1 gal/sq	EverGuard® Freedom™ TPO HW	StormSafe™ Anchor Sheet (48" wide)	32 ga., 1-5/8 in. diameter tin caps and 12 ga., 1-1/4 in. long galvanized ring shank nails spaced 6 in. o.c. in the min. 4 in. wide anchor sheet side laps and in two staggered rows in the field of the anchor sheet.	Class A; 1:12 with TOPCOAT® FireOut™ Fire Barrier Coating -OR- Class A: 1.5:12 with with VersaShield® Solo™ Fire Resistant Slip Sheet	-45.0 psf
C-22			EverGuard® Freedom™ TPO with RapidSeam™ Technology		Drill-Tec™ 3 in. Ribbed Galvalume Plate (Flat) or Drill-Tec™ 3" Standard Steel Plates and Drill-Tec™ #14 Fasteners installed 18 in. o.c. in the min. 4 in. wide anchor sheet side laps and in two staggered rows in the field of the anchor sheet.		-45.0 psf

ROOF COVER NOTE: The membrane is self-adhered to the anchor sheet per manufacturer's installation instructions. The membrane side laps are minimum 3.0 in. wide and are sealed with minimum 1.5 in. wide heat welds for EverGuard® Freedom™ TPO HW. Side laps are minimum 6.0 in. wide and sealed with the factory applied adhesive per manufacturer's installation instructions with EverGuard® Freedom™ TPO with RapidSeam™ Technology.

-Table 8- Wind Resistance and Fire Classification-

EverGuard® Freedom™ TPO HW and EverGuard® Freedom™ TPO with RapidSeam™ Technology Self-Adhered to StormSafe™ Anchor Sheet over Insulated Combustible Roof Decks

SYSTEM NO	DECK	FIRE BARRIER	INSULATION	COVER BOARD	ROOF COVER (See Note)			FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT
					Membrane	Anchor Sheet	Fasteners and Plates		
C-23	Min. 15/32 in. Plywood or 1 in. Wood Plank	VersaShield® Solo™ Fire Resistant Slip Sheet -OR- Min. 0.25 in. thick Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board or SECUROCK® Glass-Mat Roof Board -OR- TOPCOAT® FireOut™ Fire Barrier Coating applied at 1 gal/sq	(One or more of any of the following) Min. 0.5 in. thick EnergyGuard™, EnergyGuard™ RA, EnergyGuard™ RN, EnergyGuard™ Ultra, EnergyGuard™ HD or EnergyGuard™ HD Plus Polyiso Insulation, preliminarily secured.	None	EverGuard® Freedom™ TPO HW -OR- EverGuard® Freedom™ TPO with RapidSeam™ Technology	StormSafe™ Anchor Sheet (48" wide)	Drill-Tec™ 3 in. Ribbed Galvalume Plate (Flat) or Drill-Tec™ 3" Standard Steel Plates and Drill-Tec™ #14 Fasteners installed 18 in. o.c. in the min. 4 in. wide anchor sheet side laps and in two staggered rows in the field of the sheet	Class A; 0.25:12	-45.0 psf
C-24		None	(Optional, one or more of any of the following) Min. 0.5 in. thick EnergyGuard™, EnergyGuard™ RA, EnergyGuard™ RN or EnergyGuard™ Ultra Polyiso Insulation	Min. 0.25 in. thick Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board or SECUROCK® Glass-Mat Roof Board, preliminarily secured.	Class A; 1.5:12			-45.0 psf	

ROOF COVER NOTE: The membrane is self-adhered to the anchor sheet per manufacturer's installation instructions. The membrane side laps are minimum 3.0 in. wide and are sealed with minimum 1.5 in. wide heat welds for EverGuard® Freedom™ TPO HW. Side laps are minimum 6.0 in. wide and sealed with the factory applied adhesive per manufacturer's installation instructions with EverGuard® Freedom™ TPO with RapidSeam™ Technology.

**-Table 9- Wind Resistance and Fire Classification-
EverGuard® TPO and EverGuard Extreme® TPO Fully Adhered to EnergyGuard™ Polyiso over Insulated Cementitious Wood Fiber Roof Deck**

SYSTEM NO	DECK	INSULATION	INSULATION ATTACHMENT	ROOF COVER (See Note)	FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT
C-25	Cementitious Wood Fiber Roof Deck	(One or more of any of the following) Min. 1.5 in. thick EnergyGuard™ or EnergyGuard™ RA Polyiso Insulation (48 x 96 in. boards)	Insulation is secured with Drill-Tec™ Polymer Gyptec Fasteners and Drill-Tec™ 3" Gyptec Plates applied at a rate of 2.0 ft ² per fastener (16 fasteners per board)	SEE APPENDIX A, TABLE 1, ROOF COVERS 1A1, 1A2, 1A3		-45.0 psf
ROOF COVER NOTE: The membrane side laps are minimum 3.0 in. wide and are sealed with minimum 1.5 in. wide heat welds.						

**-Table 10- Wind Resistance and Fire Classification-
EverGuard® Freedom™ TPO HW and EverGuard® Freedom™ TPO with RapidSeam™ Technology Self-Adhered to StormSafe™ Anchor Sheet over Insulated Noncombustible Roof Decks**

SYSTEM NO	DECK	INSULATION (See Note)	COVER BOARD (See Note)	ROOF COVER (See Note)			FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT
				Membrane	Anchor Sheet	Anchor Sheet Attachment		
NC-13	Min. 22 ga, type B, Grade 33 steel or min. 2,500 psi concrete	(One or more of any of the following) Min. 0.5 in. thick EnergyGuard™, EnergyGuard™ RA, EnergyGuard™ RN or EnergyGuard™ Ultra Polyiso Insulation	(Optional) Min. 0.25 in. thick Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board or SECUROCK® Glass-Mat Roof Board	EverGuard® Freedom™ TPO HW -OR- EverGuard® Freedom™ TPO with RapidSeam™ Technology	StormSafe™ Anchor Sheet (48" wide)	Drill-Tec™ ASAP 3S (steel deck only) installed 18 in. o.c. in the min. 4 in. wide anchor sheet side laps and in two staggered rows in the field of the anchor sheet -OR- Drill-Tec™ 3" Steel Plates, Drill-Tec™ 3" Standard Steel Plates, Drill-Tec™ 3 in. Ribbed Galvalume Plates (Flat) and Drill-Tec™ #12 Fasteners (steel deck only) or Drill-Tec™ #14 Fasteners (steel or structural concrete deck) installed 18 in. o.c. in the min. 4 in. wide anchor sheet side laps and in two staggered rows in the field of the anchor sheet	Class A; 0.5:12	-52.5 psf
ROOF COVER NOTE: The membrane is self-adhered to the anchor sheet per manufacturer's installation instructions. The membrane side laps are minimum 3.0 in. wide and are sealed with minimum 1.5 in. wide heat welds for EverGuard® Freedom™ TPO HW. Side laps are minimum 6.0 in. wide and sealed with the factory applied adhesive per manufacturer's installation instructions with EverGuard® Freedom™ TPO with RapidSeam™ Technology.								
INSULATION & COVER BOARD NOTE: The insulation and cover board (when present) shall be preliminarily attached per manufacturer's installation instructions.								

**-Table 11- Wind Resistance and Fire Classification-
EverGuard® TPO, EverGuard Extreme® TPO, EverGuard® TPO FB Ultra and EverGuard Extreme® TPO FB Ultra
Fully Adhered over Insulated Noncombustible Roof Decks
-With Mechanically Secured EnergyGuard™ Polyiso Insulations-**

SYSTEM NO	DECK	INSULATION	INSULATION ATTACHMENT (See Note)	ROOF COVER (See Note)	FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT
				Membrane & Attachment		
NC-14	Min. 22 ga, type B, Grade 33 steel or Structural Concrete	Min. 1.5 in. thick EnergyGuard™ Polyiso Insulation (48 x 96 in.)	2.67 ft ² per fastener (12 fasteners per board)	SEE APPENDIX A, TABLE 1, ROOF COVERS 1A1, 1A2, 1A3, 1A4, 1A5		-37.5 psf
NC-15		Min. 2.0 in. thick EnergyGuard™, EnergyGuard™ RA or EnergyGuard™ RN Polyiso Insulation (48 x 96 in.)	2.0 ft ² per fastener (16 fasteners per board)			-45.0 psf
NC-16		Min. 2.0 in. thick EnergyGuard™, EnergyGuard™ RA or EnergyGuard™ RN Polyiso Insulation (48 x 96 in.)	4.0 ft ² per fastener (8 fasteners per board)			-30.0 psf
NC-17		Min. 2.0 in. thick EnergyGuard™ Polyiso Insulation (48 x 96 in.)	2.9 ft ² per fastener (11 fasteners per board)			-45.0 psf
<p>INSULATION PLATE & SCREW NOTE: Drill-Tec™ 3" Steel Plates, 3" Standard Steel Plates, AccuTrac® Flat Plates, AccuTrac® Recessed Plates, 3 in. Ribbed Galvalume Plates (Flat) and Drill-Tec™ #12 Fasteners (steel deck only) or Drill-Tec™ #14 Fasteners (steel or structural concrete) applied within the contributory area specified above.</p> <p>ROOF COVER NOTE: The membrane is adhered to the insulation with the selected adhesive per manufacturer's published installation instructions. Membrane side laps are min. 3.0 in. wide and sealed with min. 1.5 in. wide heat welds.</p>						

**-Table 11 Continued - Wind Resistance and Fire Classification-
EverGuard® TPO, EverGuard Extreme® TPO, EverGuard® TPO FB Ultra and EverGuard Extreme® TPO FB Ultra
Fully Adhered over Insulated Noncombustible Roof Decks
-With Mechanically Secured EnergyGuard™ Polyiso Insulations-**

SYSTEM NO	DECK	INSULATION	INSULATION ATTACHMENT (See Note)	ROOF COVER (See Note)	FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT
				Membrane & Attachment		
NC-18	min. 2,500 psi concrete	One or more layers of min. 0.5 in. EnergyGuard™ Polyiso Insulation (48 x 48 in.)	OlyBond 500™, OlyBond 500™ Green, LRF Adhesive M, Weather- Tite One-Step Foamable Adhesive applied in 0.75 - 1.0 in. wide ribbons spaced 12 in. o.c. -OR- GAF 2-Part Roofing Adhesive applied in 2.5 in. wide ribbons spaced 12 in. o.c.	SEE APPENDIX A, TABLE 1, ROOF COVERS 1A1, 1A2, 1A3 & 1A4		-232.5 psf
NC-19		One or more layers of min. 1.5 in. EnergyGuard™ RA or EnergyGuard™ RN Polyiso Insulation (48 x 48 in.)		SEE APPENDIX A, TABLE 1, ROOF COVERS 1A1, 1A2, 1A3 & 1A4		-135.0 psf
NC-20		One or more layers of min. 0.5 in. EnergyGuard™, EnergyGuard™ RA or EnergyGuard™ RN Polyiso Insulation (48 x 48 in.)		SEE APPENDIX A, TABLE 1, ROOF COVER 1A5		-180.0 psf
<p>INSULATION PLATE & SCREW NOTE: Drill-Tec™ 3" Steel Plates, 3" Standard Steel Plates, AccuTrac® Flat Plates, AccuTrac® Recessed Plates, 3 in. Ribbed Galvalume Plates (Flat) and Drill-Tec™ #12 Fasteners (steel deck only) or Drill-Tec™ #14 Fasteners (steel or structural concrete) applied within the contributory area specified above.</p> <p>ROOF COVER NOTE: The membrane is adhered to the insulation with the selected adhesive per manufacturer's published installation instructions. Membrane side laps are min. 3.0 in. wide and sealed with min. 1.5" in. wide heat welds.</p>						

**-Table 12- Wind Resistance and Fire Classification-
EverGuard® TPO, EverGuard Extreme® TPO, EverGuard® TPO FB Ultra and EverGuard Extreme® TPO FB Ultra Partially Adhered over Insulated
Noncombustible Roof Decks to EnergyGuard™ Polyiso Insulations-**

SYSTEM NO	DECK	INSULATION	INSULATION ATTACHMENT (See Note)	ROOF COVER (See Note)	FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT
				Membrane & Attachment		
NC-21	Min. 22 ga, type B. Grade 33 steel or Structural Concrete	Min. 1.5 in. thick EnergyGuard™, EnergyGuard™ RA or EnergyGuard™ RN Polyiso Insulation (48 x 96 in. boards)	2.67 ft ² per fastener (12 fasteners per board)	45 – 80 mil EverGuard® TPO FB Ultra or 50 – 80 mil EverGuard Extreme® TPO FB Ultra is partially adhered to the insulation with LRF Adhesive O or LRF Adhesive M applied in 0.75 – 1.0 in. wide ribbons spaced 12 in. o.c. The top surface of the roof cover is rolled per manufacturer's installation instructions to ensure complete bonding.	Class A; 0.5:12	-37.5 psf
NC-22			2.0 ft ² per fastener (16 fasteners per board)			-45.0 psf
NC-23		Min. 2.0 in. thick EnergyGuard™, EnergyGuard™ RA or EnergyGuard™ RN Polyiso Insulation (48 x 96 in. boards)	4.0 ft ² per fastener (8 fasteners per board)			-37.5 psf
NC-24			2.9 ft ² per fastener (11 fasteners per board)			-45.0 psf
NC-25	min. 2,500 psi concrete	Min. 1.5 in. thick EnergyGuard™ RA or EnergyGuard™ RN Polyiso Insulation (48 x 48 in. boards)	OlyBond 500™, OlyBond 500™ Green, LRF Adhesive M or Weather-Tite One-Step Foamable Adhesive applied in ¼ - 1.0 in. wide ribbons spaced 12 in. o.c.			-45.0 psf
NC-26	Min. 1.5 in. thick EnergyGuard™ Polyiso Insulation (48 x 48 in. boards)	-60 psf				

INSULATION PLATE & SCREW NOTE: Drill-Tec™ 3" Steel Plates, 3" Standard Steel Plates, AccuTrac® Flat Plates, AccuTrac® Recessed Plates, 3 in. Ribbed Galvalume Plates (Flat) and Drill-Tec™ #12 Fasteners (steel deck only) or Drill-Tec™ #14 Fasteners (steel or structural concrete) applied within the contributory area specified above.

ROOF COVER NOTE: The membrane is adhered to the insulation with the selected adhesive per manufacturer's published installation instructions. Membrane side laps are min. 3.0 in. wide and sealed with min. 1.5 in. wide heat welds.

**-Table 13- Wind Resistance and Fire Classification-
 EverGuard® TPO, EverGuard Extreme® TPO, EverGuard® TPO FB Ultra and EverGuard Extreme® TPO FB Ultra Fully and Partially Adhered over Insulated
 Noncombustible Roof Decks
 -With Gypsum Cover Boards-**

SYSTEM NO	DECK	INSULATION	INSULATION ATTACHMENT	COVER BOARD	COVER BOARD ATTACHMENT (See Note)	ROOF COVER (See Note)	FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT
NC-27	Min. 22 ga, type B. Grade 33 steel or min. 2,500 psi concrete	(One or more of any of the following) Min. 1.0 in. thick EnergyGuard™, EnergyGuard™ RA, EnergyGuard™ RN or EnergyGuard™ Ultra Polyiso Insulation.	Loose laid.	Min. 0.25 in. thick Dens Deck Prime®, SECUROCK® Gypsum-Fiber Roof Board (4 x 8 ft.)	4 ft ² per fastener (8 fasteners per board)	SEE APPENDIX A – TABLE 2– ROOF COVER NO’S 2A1 – 2A9 FOR APPROVED MEMBRANE, ADHESIVE AND COVER BOARD COMBINATIONS		-30.0 psf
NC-28					3.2 ft ² per fastener (10 fasteners per board)			-45.0 psf
NC-29				Min. 0.375 in. thick SECUROCK® Gypsum-Fiber Roof Board or Min. 0.5 in. thick Dens Deck Prime® (4 x 8 ft.)	4 ft ² per fastener (8 fasteners per board)			-45.0 psf
NC-30	min. 2,500 psi concrete	One or more layers of min. 0.5 in. EnergyGuard™, EnergyGuard™ RA or EnergyGuard™ RN Polyiso Insulation	OlyBond 500™, OlyBond 500™ Green, LRF Adhesive M, Weather-Tite One-Step Foamable Adhesive applied in ¼ - 1.0 in. wide ribbons spaced 12 in. o.c.	Min. 0.25 in. thick Dens Deck Prime®, SECUROCK® Gypsum-Fiber Roof Board (4 x 4 ft.)	OlyBond 500™, OlyBond 500™ Green, LRF Adhesive M, Weather-Tite One-Step Foamable Adhesive applied in ¼ - 1.0 in. wide ribbons spaced 12 in. o.c.	SEE APPENDIX A – TABLE 2– ROOF COVER NO’S 2A1, 2A2, 2A3, 2A4, 2A5, 2A7 & 2A9 FOR APPROVED FULLY ADHERED MEMBRANE, ADHESIVE AND COVER BOARD COMBINATIONS		-180.0 psf
INSULATION PLATE & SCREW NOTE:								
<p><u>Construction NC-27:</u> Dens Deck Prime® cover board is mechanically attached with Drill-Tec™ #12 Fasteners (steel deck only) or Drill-Tec™ #14 Fasteners (steel or structural concrete) Fasteners and Drill-Tec™ 3 in. Ribbed Galvalume Plates (Flat), Drill-Tec™ 3” Standard Steel Plates or Drill-Tec™ AccuTrac Flat Plates or with Drill-Tec™ ASAP 3s (steel deck only). SECUROCK® Gypsum-Fiber Roof Board cover board is mechanically attached with Drill-Tec™ #12 Fasteners (steel deck only) or Drill-Tec™ #14 Fasteners (steel or structural concrete) and Drill-Tec™ 3 in. Ribbed Galvalume Plates (Flat) or Drill-Tec™ AccuTrac Flat Plates.</p> <p><u>Constructions NC-28 & NC-29:</u> Cover board is mechanically attached with Drill-Tec™ #12 Fasteners (steel deck only) or Drill-Tec™ #14 Fasteners (steel or structural concrete) Fasteners and Drill-Tec™ 3 in. Ribbed Galvalume Plates (Flat), Drill-Tec™ 3” Standard Steel Plates or Drill-Tec™ AccuTrac Flat Plates or with Drill-Tec™ ASAP 3s (steel deck only).</p> <p>ROOF COVER NOTE: The membrane is adhered to the insulation with the selected adhesive per manufacturer’s published installation instructions. Membrane side laps are min. 3.0 in. wide and sealed with min. 1.5 in. wide heat welds.</p>								

**-Table 13 Continued - Wind Resistance and Fire Classification-
 EverGuard® TPO, EverGuard Extreme® TPO, EverGuard® TPO FB Ultra and EverGuard Extreme® TPO FB Ultra Fully and Partially Adhered over Insulated
 Noncombustible Roof Decks
 -With Gypsum Cover Boards-**

SYSTEM NO	DECK	INSULATION	INSULATION ATTACHMENT	COVER BOARD	COVER BOARD ATTACHMENT	ROOF COVER (See Note)	FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT
NC-31	min. 2,500 psi concrete	One or more layers of min. 0.5 in. EnergyGuard™, EnergyGuard™ RA or EnergyGuard™ RN Polyiso Insulation	GAF 2-Part Roofing Adhesive applied in 2.5 in. wide ribbons spaced 12 in. o.c.	Min. 0.25 in. thick Dens Deck Prime® or SECUROCK® Gypsum-Fiber Roof Board (4 x 4 ft.)	GAF 2-Part Roofing Adhesive applied in 2.5 in. wide ribbons spaced 12 in. o.c.	SEE APPENDIX A – TABLE 2– ROOF COVER NO'S 2A1, 2A2, 2A3, 2A4, 2A5, 2A7 & 2A9 FOR APPROVED <u>FULLY ADHERED</u> MEMBRANE, ADHESIVE AND COVER BOARD COMBINATIONS		-180.0 psf
NC-32			OlyBond 500™, OlyBond 500™ Green, LRF Adhesive M or Weather-Tite One-Step Foamable Adhesive applied in ¾ - 1.0 in. wide ribbons spaced 12 in. o.c.		OlyBond 500™, OlyBond 500™ Green, LRF Adhesive M or Weather-Tite One-Step Foamable Adhesive applied in ¾ - 1.0 in. wide ribbons spaced 12 in. o.c.			SEE APPENDIX A – TABLE 2– ROOF COVER NO'S 2A6 & 2A8 FOR APPROVED <u>PARTIALLY ADHERED</u> MEMBRANE, ADHESIVE AND COVER BOARD COMBINATIONS
ROOF COVER NOTE: The membrane is adhered to the insulation with the selected adhesive per manufacturer's published installation instructions. Membrane side laps are min. 3.0 in. wide and sealed with min. 1.5 in. wide heat welds.								

**-Table 14- Wind Resistance and Fire Classification-
 EverGuard® TPO, EverGuard Extreme® TPO, EverGuard® TPO FB Ultra, EverGuard Extreme® TPO FB Ultra Fully Adhered over Insulated Noncombustible Roof Decks
 with EnergyGuard™ HD and HD Plus Polyiso Insulations**

SYSTEM NO	DECK	INSULATION	INSULATION ATTACHMENT	COVER BOARD	COVER BOARD ATTACHMENT (See Note)	ROOF COVER (See Note)		FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT	
						Membrane	Membrane Attachment			
NC-33	Min. 22 ga, type B. Grade 33 steel or min. 2,500 psi concrete	(One or more of any of the following) Min. 1.5 in. thick EnergyGuard™, EnergyGuard™ RA, EnergyGuard™ RN or EnergyGuard™ Ultra Polyiso Insulation	Loose laid.	Min. 0.5 in. thick EnergyGuard™ HD or EnergyGuard™ HD Plus Polyiso Insulation	2.0 ft ² per fastener (16 fasteners per 4 x 8 ft. board)	EverGuard® TPO -OR- EverGuard Extreme® TPO	EverGuard® Low VOC TPO Bonding Adhesive applied at a total rate of 0.91 gal/sq. Half of the adhesive is applied to the membrane and half is applied to the substrate. -OR- EverGuard® #1121 Bonding Adhesive applied at a total rate of 1.67 gal/sq. Half of the adhesive is applied to the membrane and half is applied to the substrate. -OR- EverGuard® WB 181 Bonding Adhesive applied at a total rate of 0.84 – 1.0 gal/sq. One quarter of the adhesive is applied to the membrane and three quarters of the adhesive is applied to the substrate.	Class A; 0.75:12	-45.0 psf	
NC-34	min. 2,500 psi concrete		OlyBond 500™, OlyBond 500™ Green, LRF Adhesive M or Millennium One-Step Foamable Adhesive applied in 0.75-1.0 in. wide ribbons spaced 12 in. o.c.		OlyBond 500™, OlyBond 500™ Green, LRF Adhesive M or Millennium One-Step Foamable Adhesive applied in 0.75-1.0 in. wide ribbons spaced 12 in. o.c.		EverGuard® TPO FB Ultra -OR- EverGuard Extreme® TPO FB Ultra			GAF 2-Part Roofing Adhesive spray applied to the substrate in a "spatter pattern" at a rate of 3.75 lbs/sq.
NC-35			OlyBond 500™, OlyBond 500™ Green or Millennium One-Step Foamable Adhesive applied in 0.75-1.0 in. wide ribbons spaced 12 in. o.c.		OlyBond 500™, OlyBond 500™ Green, Millennium One-Step Foamable Adhesive applied in 0.75-1.0 in. wide ribbons spaced 12 in. o.c.					

ROOF COVER NOTE: The membrane is adhered to the insulation with the selected adhesive per manufacturer's published installation instructions. The membrane side laps are minimum 3.0 in. wide and are sealed with minimum 1.5 in. wide heat welds.

COVER BOARD ATTACHMENT NOTE: Secured with Drill-Tec™ #12 Fasteners (steel deck only) or Drill-Tec™ #14 Fasteners (steel or structural concrete deck) and Drill-Tec™ 3" Steel Plates, Drill-Tec™ 3" Standard Steel Plates, Drill-Tec™ AccuTrac® Flat Plates or Drill-Tec™ AccuTrac® Recessed Plates.

**-Table 15 - Wind Resistance and Fire Classification-
EverGuard® TPO and EverGuard Extreme® TPO Mechanically Secured to Standing Lap/Seam Roof Covers in Recovery Assemblies with the Drill-Tec™ RhinoBond®
Membrane Attachment System
(Membrane Bonded to Plate)**

SYSTEM NO	DECK	INSULATION (See Note)	COVER BOARD (Optional; See Note)	ROOF COVER (See Note)		FIRE RATING UL 790 / E108	ALLOWABLE WIND UPLIFT
				Membrane	Fasteners and Plates		
NC-36	Existing Standing Lap/Seam Metal Roof Cover over Min. 16 ga. Structural Steel Purlins	(One or more of the following) Min. 1.0 in. thick EnergyGuard™, EnergyGuard™ RA, EnergyGuard™ RN or EnergyGuard™ Ultra Polyiso Insulation	Min. 0.25 in. thick Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board, SECUROCK® Glass-Mat Roof Board or min. 0.5 in. thick EnergyGuard™ HD Polyiso Insulation or EnergyGuard™ HD Plus Polyiso Insulation	EverGuard® TPO -OR- EverGuard Extreme® TPO	Fasteners and Plates applied 18 in. o.c. along each structural steel purlin (max. purlin spacing of 60 in.)	Class A at 1:12 over EnergyGuard™, EnergyGuard™ RA, EnergyGuard™ RN or EnergyGuard™ Ultra Polyiso Insulations -OR- Class A at 1.5:12 over EnergyGuard™ HD or EnergyGuard™ HD Plus Polyiso Insulations (<i>when present</i>) -OR- Class A at 3:12 over Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board or SECUROCK® Glass-Mat Roof Board (<i>when present</i>)	-30.0 psf
NC-37					Fasteners and Plates applied 12 in. o.c. along each structural steel purlin (max. purlin spacing of 60 in.)		-37.5 psf
NC-38					Fasteners and Plates applied 6 in. o.c. along each structural steel purlin (max. purlin spacing of 72 in.)		-67.5 psf
NC-39	Existing Standing Lap/Seam Metal Roof Cover over Min. 14 ga. Structural Steel Purlins				Fasteners and Plates applied 18 in. o.c. along each structural steel purlin (max. purlin spacing of 60 in.)		-37.5 psf
NC-40					Fasteners and Plates applied 12 in. o.c. along each structural steel purlin (max. purlin spacing of 60 in.)		-45.0 psf

ROOF COVER NOTE:

The membrane is bonded to the Drill-Tec™ RhinoBond® TPO XHD Plates or Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates per manufacturer's installation instructions. The membrane side laps are minimum 3.0 in. wide and are sealed with minimum 1.5 in. wide heat welds.

Fasteners consist of Drill-Tec™ RhinoBond® TPO XHD Plates or Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates and Drill-Tec™ Purlin Fasteners. The Drill-Tec™ Purlin Fasteners **are driven through the insulation, existing standing metal lap/seam roof cover and into the structural steel purlins.**

When using the Drill-Tec™ RhinoBond® TPO XHD Tread Safe Plates, one must ensure the following:

- Drill a minimum 5/8 in. dia. pilot hole in the Dens Deck®, SECUROCK® Gypsum-Fiber Roof Board or SECUROCK® Glass-Mat Roof Board cover board prior to the installation of the fasteners and plates.
- The minimum thickness of board stock (insulation and cover board) must be greater than or equal to 2 in.

INSULATION & COVER BOARD NOTE: Insulation and cover board (when present) are preliminarily attached per manufacturer's installation instructions.

APPENDIX A – ADHERED ROOF COVER TABLES & FIRE CLASSIFICATIONS

APPENDIX A – TABLE 1							
Roof Cover No.	Membrane	Adhesive	Adhesive Application Rate	Substrate	Adhesive Details*	FIRE RATING UL 790 / E108	
1A1	EverGuard® TPO or EverGuard Extreme® TPO	EverGuard® Low VOC TPO Bonding Adhesive	0.91 gal/sq (total)	EnergyGuard™, EnergyGuard™ RA or EnergyGuard™ RN Polyiso Insulation	½ to membrane and ½ to substrate	Class A; 0.25:12	
1A2		EverGuard® #1121 Bonding Adhesive	1.67 gal/sq (total)		½ to membrane and ½ to substrate	Class A; 0.75:12	
1A3		EverGuard® WB 181 Bonding Adhesive	0.83 gal/sq (total)		¼ to membrane and ¾ to substrate		
1A4		EverGuard® TPO FB Ultra or EverGuard Extreme® TPO FB Ultra	EverGuard® WB 181 Bonding Adhesive		0.83 – 1.0 gal/sq (total)		Apply all adhesive to substrate. Install membrane immediately into wet adhesive.
1A5		GAF 2-Part Roofing Adhesive	3.75 lbs/sq		Spray apply all adhesive to substrate in a “spatter pattern”		Class A; 0.5:12
<i>*The membrane is adhered to the insulation with the selected adhesive per manufacturer’s published installation instructions.</i>							

APPENDIX A – TABLE 2							
Roof Cover No.	Membrane	Adhesive	Adhesive Application Rate	Substrate	Adhesive Details*	FIRE RATING UL 790 / E108	
2A1	EverGuard® TPO or EverGuard Extreme® TPO	EverGuard® #1121 Bonding Adhesive	1.67 gal/sq (total)	DensDeck® Prime or SECUROCK® Gypsum-Fiber Roof Board	½ to membrane and ½ to substrate	Class A; 1.5:12	
2A2		EverGuard® Low VOC TPO Bonding Adhesive	0.91 gal/sq (total)	DensDeck® Prime or SECUROCK® Gypsum-Fiber Roof Board	½ to membrane and ½ to substrate	Class A; 3:12	
2A3		EverGuard® WB 181 Bonding Adhesive	0.83 gal/sq (total)	DensDeck® Prime or SECUROCK® Gypsum-Fiber Roof Board	¼ to membrane and ¾ to substrate	Class A; 3:12	
2A4	EverGuard® TPO FB Ultra or EverGuard Extreme® TPO FB Ultra	EverGuard® WB 181 Bonding Adhesive	0.83 – 1.0 gal/sq (total)	DensDeck® Prime or SECUROCK® Gypsum-Fiber Roof Board	Apply all adhesive to substrate. Install membrane immediately into wet adhesive.	Class A; 3:12	
2A5		GAF 2-Part Roofing Adhesive	3.75 lbs/sq	DensDeck® Prime or SECUROCK® Gypsum-Fiber Roof Board	Spray apply all adhesive to substrate in a "spatter pattern"	Class A; 2:12	
2A6		LRF Adhesive M -OR- LRF Adhesive O	See Adhesive Details	See Adhesive Details	SECUROCK® Gypsum-Fiber Roof Board	Apply adhesive in 0.75 – 1.0 in. wide ribbons spaced 12 in. o.c	Class A; 3:12
2A7					DensDeck® Prime or SECUROCK® Gypsum-Fiber Roof Board	Apply adhesive in 0.75 – 1.0 in. wide ribbons spaced 4 in. o.c	Class A; 2:12
2A8		LRF Adhesive O	See Adhesive Details	See Adhesive Details	DensDeck® Prime	Apply adhesive in 0.75 – 1.0 in. wide ribbons spaced 12 in. o.c	Class A; 3:12
2A9					DensDeck® Prime	Apply adhesive in 0.75 – 1.0 in. wide ribbons spaced 4 in. o.c	Class A; 2:12

***The membrane is adhered to the insulation with the selected adhesive per manufacturer's published installation instructions.**

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