



## **Elevate UltraPly TPO Roof Systems Tested Assembly Guide**

**March 2023**

**NOTE: The contents of this guide are considered accurate at the time of posting. All information contained within should be validated for accuracy as it relates to specific project conditions or requirements. Specific codes, uplifts or other factors may result in changes to the information contained within this document. Validate all specific conditions with a Holcim Regional Technical Coordinator prior to its use.**

## Table of Contents

<b>Underwriters Laboratories (UL)</b> .....	6
General .....	6
Maintenance and Repair Systems .....	6
General Notations .....	7
UL Certifications (TFGU.R9516) .....	7
Elevate TPO – General Components .....	8
<b>Elevate TPO - Ballasted</b> .....	10
Elevate TPO – Ballasted – Class A .....	10
<b>Elevate TPO – Adhered Membrane</b> .....	10
Elevate TPO – Adhered Membrane – Class A .....	11
Elevate TPO – Adhered Membrane – Class B .....	12
Elevate TPO – Adhered Membrane – Class C .....	12
Elevate TPO SA – Self Adhered Membrane – Class A .....	12
Elevate TPO SA – Self Adhered Membrane – Class B .....	13
Elevate TPO XR – Adhered Membrane – Class A .....	13
Elevate TPO XR – Adhered Membrane – Class B .....	15
Elevate TPO XR – Adhered Membrane – Class C .....	16
Elevate TPO XR – Adhered Membrane – Hot Asphalt – Class A .....	16
<b>Elevate TPO – Mechanically Attached Membrane</b> .....	16
Elevate TPO – Mechanically Attached Membrane – Class A .....	16
Elevate TPO – Mechanically Attached Membrane – Class B .....	17
Elevate TPO – Mechanically Attached Membrane – Class C .....	18
Elevate TPO XR – Mechanically Attached Membrane – Class B .....	19
<b>Elevate TPO – Maintenance and Repair – Class A</b> .....	19
Elevate TPO XR – Maintenance and Repair – Class A .....	19
Elevate TPO XR – Maintenance and Repair – Class B .....	19
Elevate TPO XR – Maintenance and Repair – Class A, B, or C .....	19
<b>Elevate TPO – Maintenance and Repair Systems</b> .....	20
Elevate TPO XR – Maintenance and Repair – Class A .....	21
<b>UL Internal Fire Ratings</b> .....	21
<b>Factory Mutual General Information</b> .....	22
Ground Roughness Definitions .....	23
Ballasted Systems .....	23

- Large Wall Opening Enhancement** ..... 24
- Factory Mutual (FM) Hail Ratings** ..... 25
  - FM Hail Ratings..... 25
  - FM – Very Severe Hail ..... 26
- Factory Mutual (FM) – Roof Zone Definition** ..... 26
- Factory Mutual (FM) – Prescriptive Enhancement Options – Perimeter and Corner** ..... 28
  - Mechanically Securement of Insulation Enhancement..... 28
  - Adhesive Securement of Insulation Enhancement ..... 28
  - Mechanically Attached Membrane Securement Enhancement ..... 29
  - InvisiWeld Securement Enhancement..... 29
  - Base Sheet Attachment Over FM Approved Deck Types..... 29
  - Mechanically Attached Membrane – Preliminary Insulation Securement ..... 29
- ASCE 7 – Basic Wind Speeds for Risk/Occupancy Category** ..... 30
  - ASCE - American Society of Civil Engineers - Roof Zones – ASCE 7-10 (IBC 2015/2012)..... 30
  - ASCE 7-10 Perimeter and Corner Definition - Examples..... 31
  - ASCE 7-16 (IBC 2018) ..... 31
  - ASCE 7-16 Perimeter and Corner Definition – Examples ..... 32
- FM Approvals RoofNav Assemblies** ..... 34
  - UltraPly TPO – Adhered Membrane – Steel Deck – Gypsum Cover Board (Attached) – ISO (CF)..... 34
  - UltraPly TPO SA – Steel Deck – Insulation (CF) – Gypsum Cover Board (Attached) ..... 40
  - UltraPly TPO XR – Steel Deck – Insulation (CF) – Gypsum Cover Board (Attached) ..... 45
  - Adhered UltraPly TPO direct to ISO 95+ GL – Mechanically Attached – Steel Deck..... 47
  - Adhered UltraPly TPO direct to a Structodek Cover Board & Insulation Mech. Attached – Steel Deck ..... 48
  - Adhered UltraPly TPO direct to a ISOGARD HD Cover Board & Insulation Mech. Attached – Steel Deck ..... 48
  - Adhered UltraPly TPO direct to a OSB Cover Board & Insulation Mech. Attached – Steel Deck..... 49
  - Adhered UltraPly TPO direct to an Adhered Cover Board & Attached Insulation – Steel Deck ..... 49
  - Adhered UltraPly TPO, adhered Cover Board and/or Insulation – V-Force/MA DensDeck – Steel Deck ..... 51
  - Adhered Uplift Ratings – V-Force Vapor Barrier System – Concrete Deck..... 51
  - Adhered Uplift Ratings – SBS Vapor Barrier System – New Construction, Concrete Deck, Adhesively Attached Insulation and Cover Board ..... 52
  - Concrete Deck, Adhesively Attached Insulation, Without Cover Board ..... 52
  - Concrete Deck, Adhesively Attached Insulation, Without Cover Board ..... 53
  - Concrete Deck, Adhesively Attached Insulation, With Cover Board..... 53
  - Steel or Concrete, Mechanically Attached Insulation without Cover Board ..... 55
  - Steel, Insulation and/or Mechanically Attached Cover Board ..... 56

Steel or Concrete, Base Insulation Attached and Insulation/Cover Board Adhered .....	59
Adhered Uplift Ratings – UltraPly TPO SA Membrane .....	59
Steel Deck, Mechanically Attached Insulation, Without Cover Board .....	59
Concrete Deck, Mechanically Attached Insulation, Without Cover Board .....	60
Steel Deck, Mechanically Attached Insulation, Adhesively Attached Insulation .....	60
Steel Deck, Mechanically Attached Insulation, Adhesively Attached Insulation .....	60
Concrete Deck, Mechanically Attached Insulation, Adhesively Attached Insulation .....	61
Steel Deck, Insulation with Mechanically Attached Cover Board .....	61
Concrete Deck, Insulation with Mechanically Attached Cover Board .....	62
Elevate Adhered Uplift Ratings – UltraPly XR 100 and XR 115 membrane .....	62
Steel or Concrete Deck, Insulation without Cover Board, UltraPly XR Membrane.....	62
Steel or Concrete Deck, Insulation with Cover Board, UltraPly XR Membrane .....	63
Concrete Deck, Adhered Insulation Only, UltraPly XR Membrane.....	63
Concrete Deck, UltraPly XR Membrane .....	64
Concrete, Vapor Barrier, Adhesively Attached Insulation, UltraPly XR Membrane .....	64
Lightweight Insulated Concrete, UltraPly XR Membrane .....	64
Re-Cover Construction, Lightweight Insulating Concrete over Steel, Nailed Base Sheet with Adhesively Attached Insulation and Cover Board .....	65
Lightweight Insulating Concrete over Structural Concrete, with Adhered Insulation and Cover Board .....	65
Re-Cover Construction, Gypsum Deck, Adhered Insulation, Without Cover Board .....	65
Re-Roof Construction, Gypsum Deck, Adhesively Attached Insulation, With Cover Board .....	66
Re-Roof Construction, Gypsum Deck, Adhesively Attached Insulation, With Cover Board .....	66
Re-cover over Treated Wood Deck Adhered Membrane .....	66
<b>Mechanically Attached Systems Uplift Ratings – Standard UltraPly Membrane .....</b>	<b>67</b>
Steel, Mechanically Attached Insulation, Single Weld.....	67
Steel, Insulation with Cover Board, Single Weld .....	69
Concrete, Insulation with Cover Board, Single Weld .....	71
Recover, Metal Building, Insulation with Cover Board .....	72
Recover, Metal Building, Insulation without Cover Board .....	73
Recover, Metal Building, Flute Filler with Cover Board - Invisiweld.....	73
Recover, Steel Deck, UltraPly TPO XR Membrane .....	73
Recover, Concrete Deck, UltraPly TPO XR Membrane .....	73
Invisiweld System, Induction Welded – Insulation and No Cover Board .....	73
Invisiweld System, Induction Welded – Insulation and Cover Board.....	74
Recover, Metal Building, Invisiweld System, Induction Welded .....	76

Invisiweld-S System, Induction Welded.....	77
Re-cover over Treated Wood Deck – InvisiWeld Attached Membrane .....	77
<b>Factory Mutual Ballast Guidelines.....</b>	<b>77</b>
Stone Ballast .....	77
Aggregate Surfacing for BUR.....	77
<b>Factory Mutual – Very Severe Hail – DensDeck StormX Prime.....</b>	<b>78</b>

## Underwriters Laboratories (UL)

### General

All regional building codes and most local building code officials require that roofing systems meet minimum performance requirements when exposed to external fire sources. The accepted method for measuring external fire resistance is ASTM E-108. This test standard, and closely related standards such as Underwriters Laboratories UL-790 and Uniform Building Code 15-2, is used to determine the ability of a roof system to hinder the horizontal spread or vertical penetration of an external fire source. In accordance with these standards, all classified roof covering assemblies fall into one of the three following categories.

The class of roof covering required by each regional building code depends upon many factors, including the use and location of the building and the type of construction. The local building authority should always be consulted as to what the roofing assembly classification will need to be for each roofing project.

It should be noted that these classifications apply to roofing assemblies, and NOT the roofing membrane. A roofing membrane that is classified as part of a Class A assembly when installed over a particular insulation may not qualify as part of a Class A assembly with another insulation.

The “UL Item Number” in the following listings has been added as a service to those who have the UL Building Materials Directory. It identifies the UL listing from which our Code Approval Guide listing derives.

### Exterior Fire Ratings:

1. **CLASS A:** Includes roof coverings which are effective against severe fire exposures
2. **CLASS B:** Includes roof coverings which are effective against moderate fire exposures
3. **CLASS C:** Includes roof coverings which are effective against light fire exposures

### Deck Classifications:

1. **Noncombustible Roof Decks (NC):** Steel, Concrete, Poured Gypsum – require testing for horizontal spread of flame.
2. **Combustible Roof Decks (C):** Wood, Plywood, Tectum – require testing for both horizontal spread and vertical penetration of flame.

The following information has been referenced from the UL Online Certification Directory document: TGFU.GuidelInfo

- Certified gypsum wallboard, any thickness, may be included in any roofing system without adversely affecting the certification. Insulations may be attached to the deck with fasteners, hot mopping asphalt or certified adhesive.
- Certified insulated systems may be installed over existing certified insulated systems when:
  - The new system is certified for use with the existing roof insulation type (glass fiber, perlite, wood fiber, foamed plastic, etc.)
  - The total thickness of insulation in both systems does not exceed the maximum specified for the new system being applied.

### Maintenance and Repair Systems

These roofing systems are composed of various types of roofing applications which are specifically limited for installation (recover) over existing roofing systems as specified. These systems may not meet certification requirements without being used over existing systems. Recovering may also be accomplished with certified new construction roofing systems where compatibility has been determined by test, by empirical data or by known performance properties of similar materials to the test methods. The following guidelines are provided to assist Authorities Having Jurisdiction in determining the suitability of a new construction roofing system as a recover system.

### Noncombustible Deck Construction:

1. Insulated roof systems may be utilized over any type of existing roof system and maintain its new construction rating when the roof deck is noncombustible.
2. Insulated multiple-layered hot mopped, cold application or modified bitumen membrane new construction systems with a base ply of Type G1 or Type G2 may be used over any existing roof system and maintain its new

construction rating when the roof deck is noncombustible. The insulation may be omitted from the re-cover system.

- Uninsulated multiple-layered hot mopped, cold application or modified bitumen membrane new construction systems with a base ply of Type G1 or Type G2 may be used over any existing uninsulated roof system and maintain its new construction rating when the roof deck is noncombustible.

**Combustible Deck Construction:**

- Insulated roof systems certified for use over combustible deck can be used over any type of existing roof system and maintain its new construction rating.
- Insulated roof systems certified for use over noncombustible deck may be used over any type of Class A, B or C existing roof systems. The resultant Class will be the lesser rating of the existing system or the new construction (recover) system.
- Uninsulated multiple-layered hot mopped, cold application or modified bitumen membrane new construction systems with a base ply of Type G1 or Type G2 may be used over any existing uninsulated roof system and maintain its new construction rating.

**General Notations**

- PLEASE NOTE:** Not all UL-rated assemblies that use Holcim Solutions and Products US, LLC. are eligible for the Red Shield, Red Shield Medallion, or Platinum Warranty. The Holcim standards, guidelines, and specifications regarding roofing system components and attachment for the warranty desired must be followed.
- If a discrepancy occurs between this guide and UL Certifications, the published information located in the UL Certifications Directory at <https://productiq.ulprospector.com> should be adhered to and utilized.
- Noncombustible decks Classifications are acceptable for use over combustible (15/32" minimum plywood) decks when .5" gypsum board or .25" DensDeck® are used directly over the deck with all joints staggered 6" minimum from plywood joints.
- The below stated assemblies may not be suitable for a Red Shield Warranty. Prior to installation, contact a Holcim Representative for approval of assembly for warranty purposes.
- HAILGARD™/ISOGARD™ HG Insulation is an acceptable alternative to all insulations in the following Classifications except where DensDeck is stated.
- \*\*Water Based Bonding Adhesive -P (WBBA-P) is an equivalent to Water Based Bonding Adhesive-R (WBBA-R) (no longer available\*\*)
- ISO 95+ GL™ & ISOGARD GL is trademarked.

**UL Certifications (TFGU.R9516)**

**NOTE:** The UL assemblies listed below can be found on the UL Online Certification Direct report TGFU.R9516. You can click on the report number previously listed to open a hyperlink to the report.

The following table lists the Holcim Solutions and Products US, LLC. Elevate Brand/Trade Name and the equivalent GenFlex Roofing Systems Brand/Trade Name and is an acceptable alternate to any applicable Classification below.

Trade Names	
Elevate	GenFlex
ISO 95+ GL or ISOGARD GL	GenFlex ISO Insulation or GenFlex GL ISO Insulation
RESISTA™ or ISOGARD CG	Coated Glass Facer or GenFlex CG ISO Insulation
ISOGARD™ HD Coverboard	GenFlex HD ISO
ISOGARD HD Composite	GenFlex HD ComplISO
HailGard™ Composite Board or ISOGARD HG	GenFlex HailGard or GenFlexISO HG
I.S.O. Stick	GenFlex ISO Bond Insulation Adhesive
I.S.O. Twin Pack Insulation Adhesive	GenFlex One Step Insulation Adhesive
Fire Retardant RubberGard™	GenFlex II FR
RubberGard Platinum	GenFlex AFR EPDM 90 mil
RubberGard LS-FR	GenFlex AFR

RubberGard LS-FR PT	GenFlex AFR PT
RubberGard MAX	GenFlex II FRM
RubberGard MAX PT	GenFlex II FRM PT
RubberGard MAX FR	GenFlex II FRM-FR
RubberGard EcoWhite™	GenFlex FlexWhite EPDM
BA 2004 (T) Bonding Adhesive	GenFlex EPDM Bonding Adhesive
Single-Ply LVOC Bonding Adhesive	GenFlex EPDM Bonding Adhesive LVOC/EZ UltraPly TPO Bonding Adhesive LVOC
Single-Ply LVOC Bonding Adhesive-1168	EPDM Bonding Adhesive LVOC 1168/EZ TPO Bonding Adhesive LVOC-1168
Water Based Bonding Adhesive-P	Water Based Bonding Adhesive (P)
RubberGard™ EPDM SA	GenFlex EZ EPDM Peel & Stick
FullForce™ EPDM	Seam2Seam™ EPDM SA
RubberGard SA 1065 Splice Adhesive	GenSplice
RubberGard™ EPDM SA	Self-Adhered EPDM
QuickSeam Splice Tape	GenFlex Seam Tape
EcoWhite QuickSeam Splice Tape	GenFlex White Seam Tape
QuickSeam Batten Cover Strip	GenFlex Cover Tape
QuickPrime Plus Primer	GenPrime
Single-Ply LVOC Primer	All-Purpose LVOC Primer
UltraPly™ TPO	EZ TPO
UltraPly TPO XR 100	EZ Fleece Backed TPO (45 mil)
UltraPly TPO XR 115	EZ Fleece Backed TPO (60 mil)
UltraPly TPO XR 135	EZ Fleece Backed TPO (80 mil)
UltraPly TPO SA	EZ TPO Peel and Stick HW
PVC XR	N/A
PVC	N/A
PVC Water Based Bonding Adhesive	N/A
PVC LVOC Bonding Adhesive	N/A
PVC Bonding Adhesive	N/A
UltraPly Bonding Adhesive	EZ TPO Bonding Adhesive
XR Bonding Adhesive	Fleece Backed Bonding Adhesive
XR Stick Membrane Adhesive	EZ TPO FB Stick Adhesive
TPO QuickSeam Flashing	EZ Peel & Stick Flashing
UltraPly TPO QuickPrime	EZ Primer
V-Force	Vapor Shield Membrane
V-Force SB Primer	SA-Solvent Based (SB) Primer
SA-LVOC Primer	SA-LVOC Primer
Twin Jet	GenFlex Quick Dual

## Elevate TPO – General Components

Assembly Number	Deck	Roofing System	Max. Slope	Class
1	NC	<p><b>Insulation:</b> Any UL Classified, any thickness, adhered with Twin Jet or Quick Dual.</p> <p><b>Membrane:</b> Any UL Classified modified bitumen system, BUR system or CPE, CSM, CSPE, EPDM, NBP, PIB, PVC, TPO or TRE membrane system suitable for use with any roof insulation</p> <p><b>NOTE 1:</b> Classification (A, B or C) and maximum incline will be the same as that of the Classified Roofing System (TGFU) currently limited to noncombustible roof deck.</p>	See Note 1	A, B, or C See Note 1



Elevate TPO – General Components - Continued

Assembly Number	Deck	Roofing System	Max. Slope	Class
2	NC	<p><b>Vapor Barrier (Optional):</b> V-Force, Vapor Shield Membrane self-adhered.</p> <p><b>Roofing System:</b> Any Insulated UL Classified modified bitumen system, BUR system, or CPE, CSM, CSPE, EPDM, NBP, PIB, PVC, TPO or TRE membrane system. Insulation may be adhered with I.S.O. Twin Pack, I.S.O Twin Pack Green, I.S.O. Stick or I.S.O. Spray R or Twin Jet spray adhesive.</p> <p><b>NOTE 1:</b> Classification (A, B or C) and maximum incline will be the same as that for the currently Classified insulated system, currently limited to a noncombustible roof deck.</p>	See Note 1	A, B, or C See Note 1
3	C-15/32	<p><b>Vapor Barrier (Optional):</b> V-Force, Vapor Shield Membrane self-adhered.</p> <p><b>Insulation (Optional):</b> ISO 95+ GL or ISOGARD GL any thickness.</p> <p><b>Barrier Board:</b> Minimum ½” thick gypsum wallboard, or minimum ¼” thick Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck Prime Roof Board or DensDeck DuraGuard Roof Board, joints in barrier board offset 6” with joints in deck.</p> <p><b>Roofing System:</b> Any Insulated UL Classified modified bitumen system, BUR system, or CPE, CSM, CSPE, EPDM, NBP, PIB, PVC, TPO or TRE membrane system. Insulation may be adhered or mechanically attached with I.S.O. Twin Pack, I.S.O Twin Pack Green, I.S.O. Stick or I.S.O. Spray R or Twin Jet spray adhesive.</p> <p><b>NOTE 1:</b> Classification (A, B or C) and maximum incline will be the same as that for the currently Classified insulated system, currently limited to a combustible roof deck.</p>	See Note 1	A, B, or C See Note 1
4	C-15/32	<p><b>Vapor Barrier (Optional):</b> V-Force, Vapor Shield Membrane self-adhered.</p> <p><b>Insulation (Optional):</b> ISO 95+ GL or ISOGARD GL any thickness.</p> <p><b>Insulation:</b> 1" minimum thickness RESISTA or ISOGARD CG, joints in insulation board offset 6" with joints in deck.</p> <p><b>Roofing System:</b> Any Insulated UL Classified modified bitumen system, BUR system, or CPE, CSM, CSPE, EPDM, NBP, PIB, PVC, TPO or TRE membrane system. Insulation may be adhered or mechanically attached with I.S.O. Twin Pack, I.S.O Twin Pack Green, I.S.O. Stick or I.S.O. Spray R or Twin Jet spray adhesive.</p> <p><b>NOTE 1:</b> Classification (A, B or C) and maximum incline will be the same as that for the currently Classified insulated system, currently limited to a combustible roof deck.</p>	See Note 1	A, B, or C See Note 1
5	NC	<p><b>Insulation:</b> Any UL Classified, any thickness, adhered with I.S.O. Twin Pack, ISO Twin Pack Green, I.S.O. Stick or I.S.O. Spray R or Twin Jet spray adhesive.</p> <p><b>Membrane:</b> Any UL Classified modified bitumen system, BUR system or CPE, CSM, CSPE, EPDM, NBP, PIB, PVC, TPO or TRE membrane system suitable for use with any roof insulation.</p> <p><b>NOTE 1:</b> Classification (A, B or C) and maximum incline will be the same as that of the Classified Roofing System (TGFU) currently limited to noncombustible roof deck.</p>	See Note 1	A, B, or C See Note 1
6	C-15/32	<p><b>Insulation:</b> Any UL Classified, any thickness, adhered with I.S.O. Twin Pack, ISO Twin Pack Green, I.S.O. Stick or I.S.O. Spray R or Twin Jet spray adhesive.</p> <p><b>Barrier Board:</b> Minimum ½” thick gypsum wallboard, or minimum ¼” thick Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck Prime Roof Board or DensDeck DuraGuard Roof Board, joints in barrier board offset 6” with joints in deck.</p> <p><b>Membrane:</b> Any UL Classified modified bitumen system, BUR system or CPE, CSM, CSPE, EPDM, NBP, PIB, PVC, TPO or TRE membrane system suitable for use with any roof insulation.</p> <p><b>NOTE 1:</b> Classification (A, B or C) and maximum incline will be the same as that of the Classified Roofing System (TGFU) currently limited to combustible roof deck.</p>	See Note 1	A, B, or C See Note 1

## Elevate TPO - Ballasted

### General Notes

1. Unless otherwise indicated, the insulation and membrane are laid loosely.
2. As an alternate, the insulation may be mechanically fastened to the deck with screws and metal or plastic discs, hot roofing asphalt or a combination of screws/discs and hot roofing asphalt.
3. An optional layer of gypsum board may be placed between the insulation and the roof deck on all systems.
4. As an alternate, a Elevate "Ballast Paver" system may be used in lieu of ballast and maintain the Classification of any Classified ballasted assembly.
5. As an alternate, river bottom or crushed stone conforming to ASTM D-448 No. 3 or 24 may be used in lieu of the No. 4 stone applied at 1000 lb/100 ft<sup>2</sup> (minimum).
6. As an alternate, river bottom or crushed stone conforming to ASTM D-448 No. 1 or 2 may be used in lieu of the No. 4 stone applied at 1300 lb/100 ft<sup>2</sup> (minimum).
7. Optional) Noncombustible roof deck Classifications are applicable for use over combustible (15/32" minimum plywood) roof decks when minimum 1/2" thick gypsum board or minimum 1/4" thick Georgia-Pacific Gypsum LLC "DensDeck Roof Board" or "DensDeck Prime Roof Board" or "DensDeck DuraGuard Roof Board" are used directly over the deck with all joints staggered a minimum of 6" from plywood roof deck butt joints.
8. UltraPly TPO SA membrane is not approved for use in ballasted systems.

## Elevate TPO - Ballasted - Class A

Assembly Number	Deck	Roofing System	Max. Slope
9	C-15/32	<p><b>Insulation:</b> Any ISO 95+ insulation, any thickness, loose laid or mechanically fastened.</p> <p><b>Membrane:</b> Fire Retardant RubberGard (EPDM), 45 or 60 mil UltraPly or UltraPly (TPO), any color, Elevate APP 160, APP 160-P, Elevate APP 170, (modified bitumen) or any UL Classified CPE, EPDM, LSPE, PVC, TRE, Nitrile alloy or modified bitumen, loose laid or mechanically fastened.</p> <p><b>Surfacing:</b> River bottom stone (3/4" to 1 1/2" diameter), 1000 lb/100 ft<sup>2</sup>.</p>	2
12	NC	<p><b>Insulation (Optional):</b> Polystyrene (extruded or expanded) polyisocyanurate, glass fiber, perlite, wood fiber any combination and any thickness.</p> <p><b>Membrane:</b> Any UL Classified EPDM or TPO membrane. EPDM splices may be primed with QuickPrime Plus, and seamed with SA-1065 Splice Adhesive, QuickSeam Splice Tape or EcoWhite QuickSeam Splice Tape. Seams may be covered with QuickSeam Flashing and or QuickSeam Batten Cover (or EcoWhite QuickSeam Flashing).</p> <p><b>Surfacing:</b> River bottom stone (3/4" to 1 1/2" diameter) at 1000 lb/100 ft<sup>2</sup>.</p>	2

## Elevate TPO - Adhered Membrane

### General Notes

1. Unless otherwise indicated, the "UltraPly TPO" membranes are fully adhered with "UltraPly Bonding Adhesive", 1 gal/45 ft<sup>2</sup> finished application rate, "Water Based Bonding Adhesive P" applied at 1 1/4 gal/100 ft<sup>2</sup>, "Single-Ply LVOC Bonding Adhesive" or "Single-Ply LVOC Bonding Adhesive- 1168. Adjacent sheets are lapped 3" to 6", laps are heat sealed. Edges of laps may be sealed with 1/4" bead of "WS6-TPO-3002".
2. Noncombustible roof deck Classifications ("Fire Retardant RubberGard" systems excluded) are applicable for use over combustible (15/32" thick minimum plywood) roof decks when minimum 1/2" thick gypsum board or minimum 1/4" thick Georgia-Pacific Gypsum LLC "DensDeck Roof Board" or "DensDeck Prime Roof Board" or "DensDeck DuraGuard Roof Board" are used directly over the roof deck with butt joints in the barrier board offset a minimum of 6" from the with the plywood butt joints in the roof deck.

## Elevate TPO – Adhered Membrane – Class A

Assembly Number	Deck	Roofing System	Max. Slope
87	NC	<b>Insulation (Optional):</b> Any UL Classified, any thickness. <b>Insulation:</b> Glass fiber, wood fiber or perlite, ½" minimum thickness. <b>Membrane:</b> UltraPly TPO.	½"
88	C-15/32	<b>Insulation (Optional):</b> Any UL Classified, any thickness. <b>Barrier Board:</b> Gypsum wallboard, ½" thick minimum or minimum ¼" thick Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck Prime Roof Board or DensDeck DuraGuard Roof Board, joints in barrier board offset 6" with joints in deck. <b>Membrane:</b> UltraPly TPO.	2 ½"
123	C-15/32	<b>Slip Sheet:</b> Two layers VersaShield Underlayment or VersaShield FB-2S, preliminary attachment. <b>Insulation:</b> Elevate ISO 95+ GL (any thickness), mechanically attached. <b>Membrane:</b> Elevate .045 or .060; UltraPly TPO (1/2 :12);	½"
124	C-15/32	<b>Slip Sheet:</b> Two layers VersaShield FB-1S, preliminary attachment. <b>Insulation:</b> Elevate ISO 95+ GL (any thickness), mechanically attached. <b>Membrane:</b> Elevate.045 or .060; RubberGard LS-FR (1/2:12); RubberGard MAX or 75 mil (1/2:12); RubberGard MAX FR (3/4:12); UltraPly TPO (1/2 :12); EPDM membranes may be coated with AcryliTop PC-100 at 1 gal/100 ft <sup>2</sup> and maintain rating.	½"
125	NC	<b>Insulation:</b> Any UL Classified, any thickness, mechanically fastened. <b>Insulation:</b> Oriented strand board, minimum 7/16" thick, mechanically fastened. <b>Membrane:</b> UltraPly TPO.	1 ¼"
143	NC	<b>Insulation (Optional):</b> ISO 95+GL or ISOGARD GL, any thickness. <b>Membrane:</b> UltraPly TPO, 45 to 80 mil adhered with UltraPly Bonding Adhesive or Single-Ply LVOC Bonding Adhesive or Single-Ply LVOC Bonding Adhesive 1168, at 45-ft <sup>2</sup> /gal.	¼"
144	NC	<b>Insulation:</b> Lightweight Insulated concrete or structural concrete. <b>Membrane:</b> 45 or 60 mil UltraPly TPO fully adhered with UltraPly Bonding Adhesive at 45 ft <sup>2</sup> /gal.	2 ½"
160	NC	<b>Insulation (Optional):</b> Any UL Classified polyisocyanurate, any thickness <b>Insulation:</b> Minimum ½" thick ISOGARD HD, minimum 1" thick ISOGARD HD Composite Board or ½" thick RESISTA or ISOGARD CG <b>Membrane:</b> UltraPly TPO, fully adhered with UltraPly Bonding Adhesive, Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive -1168 or Water Based Bonding Adhesive P.	¼"
163	C-15/32	<b>Insulation (Optional):</b> ISO 95+ GL or ISOGARD GL, any thickness <b>Insulation:</b> 1" minimum ISOGARD HD Composite Board or 1" thick RESISTA or ISOGARD CG offset 6" with joints in the deck. <b>Membrane:</b> UltraPly TPO, fully adhered with UltraPly Bonding Adhesive, Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or Water Based Bonding Adhesive P.	¼"
165	C-15/32	<b>Cover Board:</b> ISOGARD HD, ½" minimum or minimum 1" thick ISOGARD HD Composite Board or ½" RESISTA or ISOGARD CG <b>Insulation:</b> ISO-95+ GL, minimum thickness 1". <b>Membrane:</b> UltraPly TPO 45 to 80 mil fully adhered with Water Based Bonding Adhesive P.	½"
166	C-15/32	<b>Insulation (Optional):</b> ISO-95+ GL or ISOGARD GL, any thickness. <b>Barrier Board:</b> Minimum 1/4-in. thick Georgia-Pacific Gypsum LLC DensDeck® or DensDeck Prime®, DensDeck®StormX™ Prime or DensDeck DuraGuard™, with all joints staggered a minimum 6 in. from the plywood joints. <b>Membrane:</b> UltraPly TPO 45 to 80 mil	2"
167	NC	<b>Insulation (Optional):</b> ISO 95+GL or ISOGARD GL, any thickness <b>Barrier Board:</b> Min. ¼" thick Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck Prime Roof Board, with all joints staggered a min. 6" from the plywood joints. <b>Membrane:</b> UltraPly TPO 45 to 80 mil	2"
180E	C-15/32	<b>Insulation:</b> Any UL Classified, any thickness. <b>Barrier Board:</b> Minimum ¼" Georgia-Pacific Gypsum LLC Dens Deck. <b>Membrane:</b> UltraPly TPO 45 to 80 mils. adhered full coverage with Jet Bond Spray Adhesive, at a rate of 800 - 1000 ft <sup>2</sup> per canister.	½"

## Elevate TPO – Adhered Membrane – Class B

Assembly Number	Deck	Roofing System	Max. Slope
22	C-15/32	<b>Base Sheet:</b> One or more plies MB Base. <b>Insulation:</b> Minimum 1" thick UL Classified wood fiber or minimum ½" thick UL Classified wood fiber over 1" thick ISO 95+GL. <b>Membrane:</b> UltraPly TPO.	½"
22a	NC	<b>Insulation:</b> Minimum 1½" thick ISO 95+GL or RESISTA, or ISOGARD CG or minimum 1½" thick UL Classified wood fiber or minimum ½" thick UL Classified wood fiber. <b>Membrane:</b> UltraPly TPO.	½"
37	C-15/32	<b>Insulation (Optional):</b> ISO 95+ GL or ISOGARD GL, any thickness <b>Insulation:</b> Minimum ½" thick ISOGARD HD, minimum 1" thick ISOGARD HD Composite Board or ½" thick RESISTA or ISOGARD CG with butt joints in the insulation offset a minimum of 6" from the with the plywood butt joints in the roof deck. <b>Membrane:</b> UltraPly TPO, adhered with UltraPly Bonding Adhesive or Water Based Bonding Adhesive P.	¼"
40	NC	<b>Cover Board:</b> Minimum ½" thick ISOGARD HD or 1" thick ISOGARD HD Composite Board or ½" thick RESISTA or ISOGARD CG. <b>Insulation:</b> ISO-95+ GL, any thickness. <b>Membrane:</b> UltraPly TPO fully adhered with UltraPly Bonding Adhesive.	1"
61	C-15/32	<b>Insulation (Optional):</b> Any UL Classified, any thickness. <b>Barrier Board:</b> Minimum ¼" thick Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck Prime Roof Board or DensDeck DuraGuard Roof Board <b>Membrane:</b> UltraPly TPO, 45 to 80 mil adhered with UltraPly Bonding Adhesive 1 gal/45 ft².	4"
62	C-15/32	<b>Insulation (Optional):</b> Any UL Classified, any thickness. <b>Barrier Board:</b> Minimum ¼" thick Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck Prime Roof Board or DensDeck DuraGuard Roof Board <b>Membrane:</b> UltraPly TPO 45 to 80 mil adhered with Single-Ply LVOC Bonding Adhesive, 1 gal/45 ft².	4"
63	C-15/32	<b>Insulation (Optional):</b> Any UL Classified, any thickness. <b>Barrier Board:</b> Minimum ¼" thick Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck Prime Roof Board or DensDeck DuraGuard Roof Board <b>Membrane:</b> UltraPly TPO 45 to 80 mil adhered with Water Based Bonding Adhesive P, 1 gal/120 ft².	4"
65	NC	<b>Insulation:</b> ISO 95 + GL, ISOGARD GL, RESISTA, ISOGARD CG, ISOGARD HD or ISOGARD HD Composite Board any thickness. <b>Membrane:</b> UltraPly TPO 45 to 80mils adhered full coverage with Jet Bond Spray Adhesive at a rate of 800 - 1000 ft² per canister.	¼"

## Elevate TPO – Adhered Membrane – Class C

Assembly Number	Deck	Roofing System	Max. Slope
12	C-15/32	<b>Insulation:</b> ISO 95+GL or ISOGARD GL, any thickness. <b>Barrier Board:</b> Minimum ¼" thick Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck Prime Roof Board or DensDeck DuraGuard Roof Board <b>Membrane:</b> UltraPly TPO fully adhered with UltraPly Bonding Adhesive, 1 gal/45 ft²	Unlimited

## Elevate TPO SA – Self Adhered Membrane – Class A

Assembly Number	Deck	Roofing System	Max. Slope
182	C-15/32	<b>Insulation (Optional):</b> Any UL Classified any thickness <b>Barrier Board:</b> Minimum ¼" Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck Prime Roof Board or DensDeck DuraGuard Roof Board <b>Membrane:</b> UltraPly TPO SA, 45 to 80 mil.	2"
183	NC	<b>Insulation:</b> ISO 95+GL or ISOGARD GL, any thickness.	¼"

		<b>Membrane:</b> UltraPly TPO SA, 45 to 80 mil.	
184	NC	<b>Insulation:</b> RESISTA or ISOGARD CG, any thickness. <b>Membrane:</b> UltraPly TPO SA, 45 to 80 mil.	¼"
184A	NC	<b>Insulation:</b> ISO 95+GL NH or ISOGARD GL any thickness. <b>Membrane:</b> UltraPly TPO SA, 45 to 80 mil.	¼"

### Elevate TPO SA – Self Adhered Membrane – Class B

Assembly Number	Deck	Roofing System	Max. Slope
45	C-15/32	<b>Insulation (Optional):</b> Any UL Classified, any thickness. <b>Barrier Board:</b> Minimum ¼" thick Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck Prime Roof Board or DensDeck DuraGuard Roof Board <b>Membrane:</b> UltraPly TPO SA, 45 to 80 mil.	3"

### Elevate TPO XR – Adhered Membrane – Class A

Assembly Number	Deck	Roofing System	Max. Slope
140	C-15/32	<b>Insulation (Optional):</b> Any UL Classified, any thickness. <b>Barrier Board:</b> Minimum ¼" thick Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck DuraGuard Roof Board or DensDeck Prime Roof Board mechanically fastened (butt joints in the barrier board staggered a minimum of 6" from plywood deck joints) <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or TPO XR 135 (80 mil), fully adhered with XR Bonding Adhesive at 45 to 60 ft <sup>2</sup> /gal.	1"
141	NC	<b>Insulation:</b> Any Classified Lightweight Insulating concrete, minimum 2" thick coverage over internal insulation (if installed). <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or TPO XR 135 (80 mil) adhered with UltraPly TPO XR Bonding Adhesive.	1"
142	NC	<b>Insulation:</b> Any Classified Lightweight Insulating concrete, minimum 2 coverage over internal insulation (if installed). <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or TPO XR 135 (80 mil) adhered with UltraPly TPO XR Bonding Adhesive.	1"
144A	NC	<b>Insulation:</b> ISO 95+ GL (any thickness), mechanically attached. <b>Membrane:</b> TPO-XR 100 or TPO-XR 115 or TPO-XR 135 (fleece backed) fully adhered with hot asphalt or adhered with Millennium PG-1 pump Grade Adhesive in ribbons spaced 12" o.c.	½"
144B	NC	<b>Insulation:</b> ISO 95+ GL or ISOGARD GL (any thickness), mechanically attached. <b>Membrane:</b> TPO-XR 100 or TPO-XR 115 or TPO-XR 135 (fleece backed) fully adhered with hot asphalt or adhered with Millennium PG-1 pump Grade Adhesive in ribbons spaced 4" o.c.	¼"
144C	C-15/32	<b>Insulation:</b> ISO 95+ GL or ISOGARD GL (any thickness), mechanically attached. <b>Barrier Board:</b> Minimum ¼" thick Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck DuraGuard Roof Board or DensDeck Prime Roof Board mechanically fastened. <b>Membrane:</b> SBS Premium Poly Base mechanically attached on the edge and the laps sealed by torch application. <b>Membrane:</b> TPO-XR 100 or TPO-XR 115 or TPO-XR 135 (fleece backed) fully adhered with hot asphalt or adhered with Millennium PG-1 pump Grade Adhesive in ribbons spaced 12" o.c.	½"
174	NC	<b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) adhered directly to structural concrete with hot asphalt.	1"
175	C-15/32	<b>Insulation:</b> (Optional) any UL Classified any thickness. <b>Barrier Board:</b> Minimum ¼" Georgia-Pacific LLC DensDeck Roof Board or DensDeck Prime Roof Board or DensDeck DuraGuard Roof Board with joint offset 6 inches from joints in the deck <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) adhered with hot asphalt.	1"
176	NC	<b>Insulation:</b> ISO 95 + GL or ISOGARD GL, any thickness, RESISTA, ISOGARD CG, ISOGARD HD or ISOGARD HD Composite Board. <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) adhered with I.S.O. Spray R or XR Stick Membrane Adhesive. Adhesive applied in	¼"

		ribbons/beads 12" o.c., or Twin Jet spray adhesive can be applied in ribbons or full coverage splatter.	
177	C-15/32	<b>Insulation:</b> Optional any UL Classified any thickness <b>Barrier Board:</b> Minimum ¼" Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck Prime Roof Board or DensDeck DuraGuard Roof Board <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) adhered with I.S.O. Spray R or XR Stick Membrane Adhesive. Applied in ribbons/beads spaced 12" o.c. Or Twin Jet spray adhesive can be applied in ribbons or full coverage splatter.	½"
178	C-15/32	<b>Insulation:</b> Optional any UL Classified and thickness. <b>Barrier Board:</b> Minimum ¼" Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck Prime Roof Board or DensDeck DuraGuard Roof Board <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) adhered with I.S.O. Spray R or XR Stick Membrane Adhesive, applied in a full coverage application. Or Twin Jet spray adhesive can be applied in ribbons or full coverage splatter.	¼"

Elevate TPO XR – Adhered Membrane – Class A – Continued

Assembly Number	Deck	Roofing System	Max. Slope
179	NC	<b>Decking:</b> Structural concrete deck or lightweight concrete <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) adhered with I.S.O. Spray R or XR Stick Membrane Adhesive applied to the deck in a full coverage application or Twin Jet spray adhesive can be applied in ribbons or full coverage splatter.	¼"
180	NC	<b>Decking:</b> Structural concrete deck or lightweight concrete <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) adhered with I.S.O. Spray R or XR Stick Membrane Adhesive applied to the deck in ribbons/beads spaced 12" o.c. or Twin Jet spray adhesive can be applied in ribbons or full coverage splatter.	½"
180A	NC	<b>Insulation:</b> ISO 95+ GL or ISOGARD GL, RESISTA or ISOGARD CG, ISOGARD HD, ISOGARD HD any thickness, loose-laid or mechanically fastened <b>Base Sheet:</b> SBS Premium Poly Base mechanically fastened. <b>Ply Sheet:</b> SBS Premium Poly Base torched adhered. <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) adhered with I.S.O. Spray R or XR Stick Membrane Adhesive. Adhesive applied in ribbons/beads 12" o.c. Or Twin Jet spray adhesive can be applied in ribbons or full coverage splatter.	¼"
180B	C-15/32	<b>Insulation (Optional):</b> ISO 95+ GL, RESISTA or ISOGARD CG, any thickness, loose-laid or mechanically fastened. <b>Barrier Board:</b> Minimum ¼" thick Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck Prime Roof Board or DensDeck DuraGuard Roof Board. <b>Base Sheet:</b> SBS Premium Poly Base mechanically fastened. <b>Ply Sheet:</b> SBS Premium Poly Base torched adhered. <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) adhered with I.S.O. Spray R or XR Stick Membrane Adhesive. Adhesive applied in ribbons/beads 12" o.c. Or Twin Jet spray adhesive can be applied in ribbons or full coverage splatter.	1"
180C	NC	<b>Insulation:</b> ISO 95+ GL or ISOGARD GL, RESISTA, or ISOGARD CG, ISOGARD HD, any thickness, loose-laid or mechanically fastened <b>Base Sheet:</b> SBS Premium Poly Base mechanically fastened. <b>Ply Sheet:</b> SBS Premium Poly Base torched adhered. <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) adhered with I.S.O. Spray R or XR Stick Membrane Adhesive. Adhesive applied in ribbons/beads 4" o.c. Or Twin Jet spray adhesive can be applied in ribbons or full coverage splatter.	1"
180D	C-15/32	<b>Insulation:</b> Any UL Classified, any thickness. <b>Barrier Board:</b> Minimum ¼" Georgia-Pacific Gypsum LLC Dens Deck	½"

		<b>Membrane:</b> UltraPly TPO XR100, XR115 or XR135 adhered full coverage with Jet Bond Spray Adhesive, at a rate of 650 - 750 ft <sup>2</sup> per canister.	
201	NC	<b>Base Sheet:</b> One or more MB Base sheet or SBS Base mechanically fastened. <b>Ply Sheet (Optional):</b> One or more layers of Ply IV or Ply VI. <b>Membrane:</b> UltraPly TPOXR 100, UltraPly TPO XR 115 or UltraPly TPO XR 135 (fleece backed) fully adhered with hot asphalt or XR Stick Membrane Adhesive, minimum ribbons 12" o/c.	1/2"

### Elevate TPO XR – Adhered Membrane – Class B

Assembly Number	Deck	Roofing System	Max. Slope
33	NC	<b>Insulation:</b> Any UL Classified, any thickness. <b>Cover Board:</b> Minimum 7/16" thick APA rated OSB, mechanically fastened. <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil), fully adhered with XR Bonding Adhesive at 90 ft <sup>2</sup> /gal.	1"

### Elevate TPO XR – Adhered Membrane – Class B – Continued

Assembly Number	Deck	Roofing System	Max. Slope
34	NC	<b>Insulation:</b> Any thickness ISO 95+ GL or ISOGARD GL mechanically fastened. <b>Base Sheet:</b> Two plies Type G2 MB Base, fully adhered with hot mopping asphalt. <b>Membrane:</b> One ply SBS premium FR, fully adhered with hot mopping asphalt. <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil), fully adhered with XR Bonding Adhesive at 80 ft <sup>2</sup> /gal.	1"
35	NC	<b>Insulation:</b> Any thickness ISO 95+ GL or ISOGARD GL mechanically fastened. <b>Base Sheet:</b> Two plies Type G2 MB Base, fully adhered with hot mopping asphalt. <b>Ply Sheet:</b> One ply APP 170, heat fused. <b>Ply Sheet:</b> One ply APP 180FR, heat fused. <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil), fully adhered with XR Bonding Adhesive at 80 ft <sup>2</sup> /gal.	1"
42	C-15/32	<b>Insulation (Optional):</b> ISO 95 + GL or ISOGARD GL, any thickness <b>Barrier Board:</b> Minimum 1/2" thick ISOGARD HD, or 1" thick ISOGARD HD Composite Board or 1/2" thick RESISTA or ISOGARD CG <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) adhered with XR Stick Membrane Adhesive applied in ribbons/beads spaced 12" o.c.	1/2"
43	NC	<b>Insulation (Optional):</b> ISO 95 + GL or ISOGARD GL, any thickness. <b>Barrier Board:</b> Minimum 1/2" thick ISOGARD HD or 1" thick ISOGARD HD Composite Board or 1/2" thick RESISTA or ISOGARD CG. <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) adhered with XR Stick Membrane Adhesive applied in ribbons/beads spaced 12" o.c.	3/4"
51	C-15/32	<b>Base Sheet:</b> Two or more plies of MB Base sheet or SBS Base mechanically fastened. <b>Ply Sheet (Optional):</b> One or more plies of Ply IV or Ply VI. <b>Membrane:</b> UltraPly TPOXR 100, UltraPly TPO XR 115 or UltraPly TPO XR 135 (fleece backed) fully adhered with hot asphalt or XR Stick Membrane Adhesive, minimum ribbons 12" o/c.	1/2"
54	C-15/32	<b>Barrier Board:</b> Minimum 1/4" thick Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck Prime Roof Board or DensDeck DuraGuard Roof Board <b>Insulation (Optional):</b> ISO 95+ GL or ISOGARD GL, any thickness. <b>Insulation:</b> Minimum 1/2" thick wood fiber. <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) adhered with hot asphalt.	1/2"
55	NC	<b>Insulation (Optional):</b> ISO 95+ GL or ISOGARD GL, any thickness. <b>Insulation:</b> Minimum 1/2" thick wood fiber <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) adhered with hot asphalt.	1/2"
55A	NC	<b>Insulation:</b> ISO 95+ GL (any thickness), mechanically attached. <b>Membrane:</b> TPO-XR 100, 115 or 135 (fleece backed) fully adhered with hot asphalt or adhered with Millennium PG-1 pump Grade Adhesive in ribbons spaced 12" o.c.	3/4"

55B	NC	<b>Insulation:</b> ISO 95 + GL any thickness, ISOGARD GL, RESISTA, ISOGARD CG, ISOGARD HD or ISOGARD HD Composite Board <b>Membrane:</b> UltraPly TPO XR100, XR115 or XR135 adhered full coverage with Jet Bond Spray Adhesive, at a rate of 650 - 750 ft <sup>2</sup> per canister.	¼"
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### Elevate TPO XR – Adhered Membrane – Class C

Assembly Number	Deck	Roofing System	Max. Slope
14	NC	<b>Insulation:</b> ISO 95 + GL or ISOGARD GL, any thickness. <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) adhered with I.S.O. Spray R or XR Stick Membrane Adhesive full coverage. Or Twin Jet spray adhesive can be applied in ribbons or full coverage splatter.	¼"

### Elevate TPO XR – Adhered Membrane – Hot Asphalt – Class A

Assembly Number	Deck	Roofing System	Max. Slope
20	NC	<b>Insulation:</b> ISO 95+ GL or ISOGARD GL, RESISTA or ISOGARD CG, ISOGARD HD, ISOGARD HD Composite any thickness, loose-laid or mechanically fastened. <b>Base Sheet:</b> One ply SBS Premium Poly Base, mechanically fastened. Inter Ply Sheet: One ply SBS Premium Poly Base, fully adhered with hot mopping asphalt. <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil), fully adhered with hot mopping asphalt.	¼"
21	NC	<b>Insulation:</b> ISO 95+ GL or ISOGARD GL, RESISTA or ISOGARD CG, any thickness, mechanically fastened. <b>Barrier Board:</b> Minimum ¼" thick Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck Prime Roof Board or DensDeck DuraGuard Roof Board mechanically fastened. <b>Base Sheet:</b> One ply SBS Premium Poly Base, mechanically fastened. <b>Ply Sheet:</b> One ply SBS Premium Poly Base, fully adhered with hot mopping asphalt. <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil), fully adhered with hot mopping asphalt.	¼"

### Elevate TPO – Mechanically Attached Membrane

#### General Notes

1. Unless otherwise specified, the "UltraPly" membrane is mechanically fastened with large head metal or plastic fasteners spaced 18" OC and maximum 2" from membrane's edge. Adjacent sheets are lapped 4", covering fasteners. Laps are heat sealed "UltraPly TPO" lap edges may be sealed with ¼" diameter bead of "UltraPly TPO General Purpose Sealant".
2. Noncombustible roof deck Classifications ("Fire Retardant RubberGard" systems excluded) are applicable for use over combustible (15/32" thick minimum plywood) roof decks when minimum ½" thick gypsum board or minimum ¼" thick Georgia-Pacific Gypsum LLC "DensDeck Roof Board" or "DensDeck Prime Roof Board" or "DensDeck DuraGuard Roof Board" are used directly over the roof deck with butt joints in the barrier board offset a minimum of 6" from the with the plywood butt joints in the roof deck.

### Elevate TPO – Mechanically Attached Membrane – Class A

Assembly Number	Deck	Roofing System	Max. Slope
52	NC	<b>Insulation:</b> ISOGARD GL ISO any thickness <b>Membrane:</b> UltraPly TPO 45 - 80 mils	¼"
56	NC	<b>Insulation:</b> ISO 95+GL, any thickness. <b>Membrane:</b> UltraPly TPO.	½"
57	NC	<b>Insulation (Optional):</b> Any UL Classified, any thickness. <b>Insulation:</b> Minimum ½" thick glass fiber, wood fiber or perlite, ½" minimum thickness. <b>Membrane:</b> UltraPly TPO.	2"
58	C-15/32	<b>Insulation (Optional):</b> Any UL Classified, any thickness. <b>Barrier Board:</b> Minimum ½" thick water resistant or regular wallboard or minimum ¼" thick	4"



		Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck Prime Roof Board or DensDeck DuraGuard Roof Board with butt joints in the barrier board offset a minimum of 6" from the with the plywood butt joints in the roof deck. <b>Membrane:</b> UltraPly TPO.	
58A	C-15/32	<b>Insulation:</b> 1/2" thick ISOGARD HD with butt joints in the insulation offset a minimum of 6" from the with the plywood butt joints in the roof deck. <b>Membrane:</b> UltraPly TPO 45 - 80 mils.	1/2"
63	C-15/32	<b>Slip Sheet:</b> Two or more plies Atlas Roofing Corp. Roofing FR 50, mechanically fastened. <b>Membrane:</b> UltraPly TPO	1/2"

### Elevate TPO – Mechanically Attached Membrane – Class A – Continued

Assembly Number	Deck	Roofing System	Max. Slope
75	C-15/32	<b>Slip Sheet:</b> Two layers GAF VersaShield Underlayment or VersaShield FB-2S, preliminary attachment. <b>Membrane:</b> .045 or .060; RubberGard LS-FR (1/2:12); RubberGard MAX (1/2:12); RubberGard MAX FR or 75 mil (1-1/2:12); UltraPly TPO (1:12); EPDM membranes may be coated with AcryliTop PC-100 at 1 gal/100-ft2 and maintain rating.	1"
76	C-15/32	<b>Slip Sheet:</b> Two layers GAF VersaShield Underlayment or VersaShield FB-2S, preliminary attachment. <b>Insulation:</b> ISO 95+ GL (any thickness), preliminary attachment. <b>Membrane:</b> .045 or .060 UltraPly TPO	1/2"
77	C-15/32	<b>Slip Sheet:</b> Two layers GAF VersaShield FB-1S, preliminary attachment. <b>Insulation (Optional):</b> ISO 95+ GL (any thickness), preliminary attachment. <b>Membrane:</b> .045 or .060 UltraPly TPO	1/2"
82	NC	<b>Insulation (Optional):</b> Any UL Classified, any thickness <b>Insulation:</b> Minimum 1/2" thick ISOGARD HD or minimum 1" thick ISOGARD HD Composite Board or 1/2" thick RESISTA <b>Membrane:</b> UltraPly TPO	3/4"
87	C-15/32	<b>Insulation (Optional):</b> ISO 95+ GL or ISOGARD GL, any thickness. <b>Insulation:</b> ISOGARD HD Composite Board or RESISTA or ISOGARD HD with butt joints in the insulation offset a minimum of 6" from the with the plywood butt joints in the roof deck <b>Membrane:</b> UltraPly TPO, mechanically attached.	1/2"
90	C-15/32	<b>Insulation (Optional):</b> Any UL Classified, any thickness, any combination. <b>Insulation:</b> 1" thick RESISTA or ISOGARD CG Insulation <b>Membrane:</b> UltraPly TPO 45 to 80 mils.	1/2"
91	NC	<b>Insulation (Optional):</b> Any UL Classified, any thickness, any combination. <b>Insulation:</b> 1/2" thick RESISTA or ISOGARD CG Insulation. <b>Membrane:</b> UltraPly TPO 45 to 80 mils.	1"
94	NC	<b>Insulation Concrete:</b> Deck covered with either of the following insulating concretes (poured in place): cellular, vermiculite, perlite, gypsum or structural. Optionally, a base concrete deck may be used if all exposed surface joints are grouted. <b>Membrane:</b> 45 to 80 mil UltraPly TPO	1"

### Elevate TPO – Mechanically Attached Membrane – Class B

Assembly Number	Deck	Roofing System	Max. Slope
3	C-15/32	<b>Slip Sheet:</b> One layer Atlas Roofing Corp. FR 50. <b>Membrane:</b> Any one of the following: a). UltraPly TPO.	1/2"
4	C-15/32	<b>Base Sheet:</b> One or more plies MB Base. <b>Insulation:</b> Minimum 1 1/2" thick ISO 95+GL or minimum 1" thick FiberTop B or minimum 1/2" thick any UL Classified wood fiber over 1" thick ISO 95+GL or ISOGARD GL.	1"

		<b>Membrane:</b> UltraPly TPO.	
5	C-15/32	<b>Insulation:</b> Minimum 1 1/2" thick FiberTop B or minimum 1/2" thick FiberTop B over 1 1/2" thick ISO 95+GL. <b>Membrane:</b> UltraPly TPO.	1"
12	C-15/32	<b>Slip Sheet:</b> One layer GAF VersaShield Underlayment or VersaShield FB-2S, preliminary attachment. <b>Membrane:</b> .045 or .060; RubberGard LS-FR (1/2:12); RubberGard MAX or 75 mil (1/2:12); RubberGard MAX FR (1 1/2:12); UltraPly TPO (1:12); EPDM membranes may be coated with AcryliTop PC-100 at 1 gal/100 ft <sup>2</sup> and maintain rating.	1"

### Elevate TPO – Mechanically Attached Membrane – Class B – Continued

Assembly Number	Deck	Roofing System	Max. Slope
15	C-15/32	<b>Insulation (Optional):</b> ISO 95+ GL or ISOGARD GL, any thickness. <b>Insulation:</b> Minimum 1/2" thick ISOGARD HD or minimum 1" thick ISOGARD HD Composite Board or 1/2" thick RESISTA or ISOGARD CG with butt joints in the insulation offset a minimum of 6" from the plywood butt joints in the roof deck <b>Membrane:</b> UltraPly TPO, mechanically attached.	1/2"
18	C-15/32	<b>Insulation (Optional):</b> Any UL Classified, any thickness, any combination. <b>Barrier Board:</b> Minimum 1/4" thick Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck Prime Roof Board or DensDeck DuraGuard Roof Board <b>Membrane:</b> UltraPly TPO, 45 - 80 mil, mechanically fastened.	Unlimited
19	C-15/32	<b>Insulation:</b> Minimum 1" thick RESISTA or ISOGARD CG with butt joints in the insulation offset a minimum of 6" from the plywood butt joints in the roof deck. <b>Membrane:</b> UltraPly TPO 45 - 80 mil, mechanically fastened.	3/4"
20	C-15/32	<b>Insulation:</b> ISO 95+ GL or ISOGARD GL, minimum 2 1/2" thick loose-laid or mechanically fastened with butt joints in the insulation offset a minimum of 6" from the plywood butt joints in the roof deck. <b>Cover Board:</b> 1/2" ISOGARD HD Board with butt joints in the cover board offset a minimum of 24" from the plywood butt joints in the roof deck. <b>Membrane:</b> UltraPly TPO 45 to 80 mils, mechanically fastened.	1/2"
21	C-15/32	<b>Insulation:</b> Minimum 1/2" thick ISOGARD HD or minimum 1" thick ISOGARD HD Composite Board or 1/2" thick RESISTA <b>Membrane:</b> UltraPly TPO 45 to 80 mils, mechanically fastened.	1 1/2"
22	NC	<b>Insulation:</b> Minimum 1/2" thick ISOGARD HD or minimum 1" thick ISOGARD HD Composite Board or 1/2" thick RESISTA <b>Membrane:</b> UltraPly TPO 45 to 80 mils, mechanically fastened.	1 1/2"

### Elevate TPO – Mechanically Attached Membrane – Class C

Assembly Number	Deck	Roofing System	Max. Slope
1	NC	<b>Barrier Board:</b> Minimum 1/4" thick Georgia-Pacific Gypsum LLC DensDeck Roof Board or DensDeck Prime Roof Board or DensDeck DuraGuard Roof Board <b>Membrane:</b> UltraPly TPO	1/2"
7	NC	<b>Insulation:</b> ISO 95+GL or ISOGARD GL, any thickness. <b>Membrane:</b> UltraPly TPO, 45 to 80 mils, mechanically fastened	Unlimited
12	C-15/32	<b>Insulation:</b> Minimum 3" thick ISO 95+GL, loose laid or mechanically fastened <b>Membrane:</b> UltraPly TPO 45 - 80 mils, mechanically fastened	1/2"
13	C-15/32	<b>Insulation:</b> Minimum 3" thick ISO 95+GL, loose laid or mechanically fastened <b>Membrane:</b> UltraPly TPO 45 to 80 mils, mechanically fastened	Unlimited
14	C-15/32	<b>Insulation:</b> Minimum 1/2" thick ISOGARD HD or minimum 1" thick ISOGARD HD Composite Board or 1/2" thick RESISTA	Unlimited

		<b>Membrane:</b> UltraPly TPO 45 to 80 mils, mechanically fastened	
15	NC	<b>Insulation:</b> Minimum ½" thick ISOGARD HD or minimum 1" thick ISOGARD HD Composite Board or ½" thick RESISTA. <b>Membrane:</b> UltraPly TPO 45 to 80 mils, mechanically fastened	Unlimited

### Elevate TPO XR – Mechanically Attached Membrane – Class B

Assembly Number	Deck	Roofing System	Max. Slope
13	NC	<b>Insulation:</b> 4" thick ISO 95+ GL or ISOGARD GL, mechanically fastened. <b>Base Sheet:</b> One ply Type G2 MB Base, mechanically fastened. <b>Ply Sheet:</b> One ply Type G3 fully adhered with hot mopping asphalt. <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil), mechanically fastened.	1"

### Elevate TPO – Maintenance and Repair – Class A

#### General Notes

Unless otherwise indicated, insulation and base sheets may be mechanically attached, hot mopped or attached with cold application adhesive as Listed under Adhesive, Roof Construction Materials, in any system incorporating modified bitumen.

### Elevate TPO XR – Maintenance and Repair – Class A

Assembly Number	Deck	Roofing System	Max. Slope
16	NC	<b>Existing Roof System:</b> Class A, B or C covered with: <b>Insulation:</b> Any Classified Lightweight Insulating concrete, minimum 2" thick coverage over internal insulation (if installed). <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) adhered with UltraPly TPO XR Bonding adhesive or with hot asphalt.	1"

### Elevate TPO XR – Maintenance and Repair – Class B

Assembly Number	Deck	Roofing System	Max. Slope
7	NC	<b>Existing Roof System:</b> Class A, B or C insulated, or un-insulated EPDM roofing system covered with: <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) adhered with UltraPly TPO XR Bonding Adhesive, 80 ft.2/gal.	½"

### Elevate TPO XR – Maintenance and Repair – Class A, B, or C

Assembly Number	Deck	Roofing System	Max. Slope
3	C-15/32	<b>Existing Roof System:</b> Class A, B or C, BUR (mineral surfaced cap sheet), to retain existing Classification, covered with: <b>Membrane:</b> 60 mil. UltraPly TPO XR 115 Fleece Backed Membrane fully adhered with XR Bonding Adhesive applied at 80 ft2/gal.	1"
5	C-15/32	<b>Existing Roof System:</b> To Maintain Existing Classification, Any Class A, B or C insulated or un-insulated. Type G3 mineral surfaced cap sheet, BUR or modified bitumen membrane roofing system covered with: <b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) adhered with I.S.O. Spray R or XR Stick in full coverage or applied in ribbons/beads. Or Twin Jet spray adhesive can be applied in ribbons or full coverage splatter.	¼"
6	C-15/32	<b>Existing Roof System:</b> To Maintain Existing Classification, Any Class A, B or C insulated or un-insulated. Type G3 mineral surfaced cap sheet or APP modified bitumen membrane roofing system covered with:	½"

	<b>Membrane:</b> UltraPly TPO XR 100 (45 mil), UltraPly TPO XR 115 (60 mil) or UltraPly TPO XR 135 (80 mil) mechanically attached.	
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## **Elevate TPO – Maintenance and Repair Systems**

### **General Notes**

Unless otherwise indicated, insulation and base sheets may be mechanically attached, hot mopped or attached with cold application adhesive as Listed under Adhesive, Roof Construction Materials, in any system incorporating modified bitumen.

## Elevate TPO XR – Maintenance and Repair – Class A

Assembly Number	Deck	Roofing System	Max. Slope
1	C-15/32	<b>Existing Roof System:</b> Class A, B or C, BUR (smooth surface or cap sheet), to retain existing Classification, covered with: <b>Slip Sheet:</b> Atlas Roofing Corp. FR 10 or FR 11, one layer. <b>Membrane:</b> UltraPly TPO, mechanically fastened.	1"
2	C-15/32	<b>Existing Roof System:</b> Any Class A, B or C Build-Up Roof System, to retain rating place. <b>Slip Sheet:</b> One layer VersaShield Underlayment, preliminary attachment. <b>Membrane:</b> .045 or .060 mil UltraPly TPO	1"
4	C-15/32	<b>Insulation:</b> Any UL Classified, any thickness, adhered with I.S.O. Twin Pack. <b>Membrane:</b> Any UL Classified modified bitumen system, BUR system or CPE, CSM, CSPE, EPDM, NBP, PIB, PVC, TPO or TRE membrane system suitable for use with any roof insulation. <b>Note 1:</b> Classification (A, B or C) and maximum incline will be the same as that of the Classified Roofing System (TGFU) currently limited to noncombustible roof deck.	See Note 1
7	C-15/32	Existing Roof System: Class A, B or C, BUR (smooth surface or cap sheet), to retain existing Classification, covered with: <b>Slip Sheet:</b> Atlas Roofing Corp. FR 10 or FR 11, one layer or Type G2 Base sheet laid loosely including MB Base. <b>Membrane:</b> UltraPly TPO, mechanically fastened.	½"
8	C-15/32	<b>Existing Roof System:</b> Class A, B or C roofing system, to retain the existing Classification, is covered with: <b>Slip Sheet (Optional):</b> One or more layers GAF VersaShield, Atlas Roofing Corp. FR 10 or FR 50. <b>Insulation (Optional):</b> ISOGARD HD, RESISTA, or ISOGARD CG, ISO 95+ GL any thickness. <b>Membrane:</b> RubberGard Max, Fire Retardant RubberGard, RubberGard MAX FR, RubberGard LS-FR or UltraPly TPO and UltraPly TPO XR 100, 115 or 135 membranes mechanically fastened. <b>Note 1:</b> Maximum incline not to exceed that for which the existing roofing system is currently Classified.	See Note 1
11	C-15/32	<b>Existing Roof Systems:</b> Class A, B or C, BUR (smooth surface of cap sheet) to retain existing classification covered with: <b>Insulation:</b> ½" thick ISOGARD HD or minimum 1" thick ISOGARD HD Composite Board. <b>Membrane:</b> UltraPly TPO	Adhered ¼" Attached ½"

## UL Internal Fire Ratings

The assemblies referenced below can be found on the UL Product IQ website. (<https://productiq.ulprospector.com>) To determine the resistance of a building to internal sources of fire, Underwriters Laboratories has conducted extensive testing and classification of wall, floor/ceiling, and roof/ceiling assemblies. UL classified assemblies are rated according to the time in hours the assembly will contain a fire and still maintain structural integrity. Testing is conducted in accordance with UL Standard 263 (ASTM E-119), which is recognized by all major building codes.

**Roof/Ceiling Assemblies** are listed in the UL Fire Resistance Directory - Vol. 1 under the prefix "P" and are classified by hourly fire rating according to the type of protection used to contain a fire:

Assembly	Protection Used
P000 – P099	Concealed Grid Suspended Ceiling
P200 – P299	Exposed Grid Suspended Ceiling
P400 – P499	Metal Lathe (Plaster) Ceiling
P500 – P599	Gypsum Board Ceiling
P600 – P699	Miscellaneous Fireproofing
P700 – P799	Spray-Applied Resistive Material
P800 – P899	Spray-Applied Resistive Material
P900 – P999	Unprotected Concrete or Composite Decks

It should be noted that the roof membrane forms only a small part of the total roof/ceiling assembly. For a structure to qualify for a “P” Assembly or Roof Deck Construction, all materials used to construct the assembly (including roof decking, ceiling materials, light fixtures, duct work and structural support members) must be UL classified and installed as described in the appropriate UL Directories.

The insulations listed with each of the following “P” Assemblies are not, in most cases, the only UL accepted insulations for that assembly. Consult the UL Fire Resistance Directory - Vol. 1 for “P” Assembly information and the UL Roofing Materials and Systems Directory for Roof Deck Construction information or call Holcim Technical Services for additional accepted insulations.

UL has indicated on page 8 of the 2008 Fire Resistance Directory - Vol. 1 that "Class A, B or C roof coverings consisting of hot mopped or cold applied bituminous materials or a roof covering material classified under 'Roofing Membranes' (CHCI) may be applied directly to the concrete or wood surface of floor designs being used as roofs without a reduction of fire resistance ratings." They further state on page 8 that "Roof insulation is to be carefully controlled relative to manufacturer, type and thickness as specified. Less than the specified thickness could result in higher temperatures on the roof covering while a greater thickness of insulation could cause earlier structural failure. Classified polystyrene insulation, with a density of 5 pcf or less, may be placed on concrete floors or structural concrete roofs without reducing the assembly rating. When polyisocyanurate insulation is used over concrete in D 900 Series Designs, the unrestrained beam rating shall be increased by a minimum of ½ hour."

**Roof Deck Constructions** are listed in the UL Roofing Materials and Systems Directory and are rated according to the interior flame spread of the assembly as compared to the flame spread of a typical built-up roof installed over a metal deck (UL 1256). Roof Deck Constructions may also be classified according to wind uplift performance. The fire rating of a UL Roof Deck Construction is similar to the Factory Mutual Class I internal fire (calorimeter) rating, and they are deemed equivalent by the Model Building Code Agencies.

#### **UL Roof Deck Constructions and “P” Assemblies Deck Constructions (Tested in accordance to UL 1256)**

UltraPly TPO 96/120 roofing systems are classified for use in the following Deck Construction:

1, 2, 9, 14, 120, 123, 158, 200, 219, 237, 260, 276, 289, 292, 325, 374, 411, 412, 413, 419, 421, 440, 441, 444, 457, and 458. Consult Roof Deck Constructions (TGKX) in the UL Roofing Materials and Systems Directory, a Regional Technical Coordinator, or the Elevate Codes Department for an acceptable insulation for use in these constructions.

#### **“P” Assemblies (Designs)**

UltraPly TPO roofing systems are classified for use in the following hourly roof / ceiling designs. Ballasted, adhered or mechanically attached systems with or without optional wood fiber or mineral board insulation for use in Design numbers: P215, P216, P225, P227, P230, P231, P242, P246, P251, P259, P405, P406, P407, P410, P508, P510, P511, P512, P513, P514, P519, P701, P708, P709, P710, P711, P712, P717, P718, P719, P720, P722, P723, P725, P726, P727, P728, P729, P730, P731, P732, P733, P734, P735, P737, P738, P739, P801, P810, P811, P815, P819, P822, P824, P825, P826, P827, P902, P903, P904, P905, P906, P907, P908, P909, P910, P911, P912, P913, P914, P915, P916, P917, P919, P920, P921, P922, P923, P925, P926, P927, P928, P929, P930, P931

Consult Fire Resistance Ratings (BXUV) in the UL Fire Resistance Directory, a Regional Technical Coordinator, or the Elevate Codes Department for an acceptable insulation, thickness, and additional requirements.

**NOTE:** The accepted insulation must be used in a UL Class A, B or C rated roofing assembly. UL acceptable system (e.g., adhering EPDM to Perlite or Fiberglass) listed for "P" design may not be approved for installation and warranty by Holcim Solutions and Products US, LLC. Contact Holcim Technical Services or a Holcim Regional Technical Coordinator concerning acceptance.

## **Factory Mutual General Information**

Factory Mutual Class 1 Approvals cover a wide range of testing of roofing products, including tests for fire resistance, corrosion resistance, fuel contribution and hail damage, Factory Mutual Approvals are known best for the uplift resistance, 1-60, 1-90, etc. afforded by an FM Approved roofing assembly:

- FM 1-60 assemblies have been tested to withstand 60 psf air pressure applied for a period of one minute as well as one minute at the 30 and 45 psf levels.
- FM 1-90 assemblies have been tested to withstand 90 psf air pressure applied for a period of one minute as well as one minute at the 30, 45, 60 and 75 psf levels.
- Higher uplift ratings are possible based on the deck type and its attachment, fastener density and row spacing where applicable.

When Factory Mutual 1-60 or 1-90 uplift ratings are specified, additional insulation attachment and reduced perimeter and corner batten (in-seam plate or batten for Reinforced Systems) spacing will/may be required. Consult the current edition of Factory Mutual Loss Prevention Data Sheets 1-28 and 1-29 for instructions for determining the required corner and perimeter dimensions and reduced spacing and increased fastener densities.

### Ground Roughness Definitions

The descriptions below are based on information in ASCE 7. While information on this subject in the body of that standard is relatively brief, the designer must read the considerable additional information provided in the related commentary section of that document, particularly when the exposure is not obvious.

#### For Exposure Category B to be used:

- The exposing terrain should include urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger.
- Use of this exposure category should be limited to those areas for which the above terrain prevails in all directions for a distance of at least 2600' (800 m) or 20 times the height of the building or other structure, whichever is greater.
- Limited openings in this terrain, such as small parking lots, roads, road intersections, playing fields, underdeveloped lots, and tree clearings can be tolerated. For openings that exceed 600' (180 m) in total length measured radially from the building and 165' [50 m] in width, use surface roughness exposure C.
- For buildings whose height is less than or equal to 30' (9.1 m), the prevailing exposure B distance may be reduced to 1500' (460 m).
- In cases where the difference between exposures B and C is not obvious, use exposure C.

#### For Exposure Category C to be used:

**NOTE:** In cases where the difference between exposure B and C is not obvious, use exposure C.

- The exposing terrain should be open with scattered obstructions having heights generally less than 30' (9 m), such as flat, open country and grasslands, and in all cases where exposures B and D do not apply.
- This also includes where surface roughness exposure B terrain is interrupted by clearings (parking lots, wide roads, road intersections, playing fields, underdeveloped lots, tree clearings, etc.) of greater than 600' (180 m) in total length measured radially from the building and exceeding 165' (50 m) in width.

#### For Exposure Category D to be used in determining the design wind pressure, all the following must be met:

**NOTE:** Some examples of D exposures include inland waterways, the Great Lakes, and coastal areas. See fig. 3.2.2.3 in FM Global LPDA 1-28 for examples of Exposure D requirements.

- The terrain upwind of the structure must be flat, unobstructed areas or water surfaces including smooth mud flats, salt flats, and unbroken ice and is present in the upwind direction for a distance greater than approximately 5000' (1500 m) or 20 times the building height, and
- The building must be within the greater of 600' (180 m) or 20 times the building or structure height from the terrain (see Fig. 3.2.2.3), even if the terrain between the building and the terrain described in A. above would otherwise be considered Category B or C.

### Ballasted Systems

The following information has been extracted from FM Global Property Loss Prevention Data Sheet 1-29. FM Approvals does not approve ballasted systems. If a ballasted system is to be used, select components that are FM Approved for use together as shown in a specific RoofNav assembly. In lieu of fasteners or adhesives used to secure above-deck components, use ballast in accordance with information found in LPDS 1-29, Section 2.2.10.17 to provide wind resistance.

It is not possible to evaluate the uplift resistance of ballasted systems in the same manner as adhered coverings. The criterion for failure for the latter systems is separation of the covering from the insulation, or the insulation from the deck. Ballasted systems fail these criteria by definition.

Uplift forces are not uniform over the entire roof. Properly designed ballasted systems, take advantage of the average uplift force in a given roof area. The membrane distributes the uplift force, allowing the ballast to be effectively used. Extreme winds, however, may cause gravel scour, paver dislodgement, and ballooning of the covering. A parapet at least 3 feet (0.9 m) will help to reduce ballast scour.

### General Notations

**PLEASE NOTE: Not all FM-rated assemblies that use Elevate roofing products are eligible for the Red Shield, Red Shield Warranty.** The Holcim standards, guidelines, and specifications regarding roofing system components and attachment for the warranty desired must be followed.

RoofNav® assemblies are summarized in the following tables; however, an assembly search should be conducted to confirm the attachment rates and requirements set for in the approval number. On all occasions, should a discrepancy occur between this guide and RoofNav, the published information located in the approval at [www.roofnav.com](http://www.roofnav.com) should be adhered and utilized.

Additionally, please be aware that the following assemblies typically are in reference to the field of the roof rating and attachment. Please refer to FM Global Loss Prevention Data Sheet 1-28 and 1-29 to determine the requirements for additional fastening requirements in the perimeter and corner.

In all cases, when the project is Factory Mutual insured, please consult the FM agent assigned to the review of the project to ensure compliance.

The assemblies listed in this document may not be suitable for a Red Shield Warranty. Prior to installation, contact a Holcim Technical Representative for approval of assembly for warranty purposes.

It is acceptable to use multiple layers of FM Approved insulation, mechanically secured through all layers, provided all the following are true:

- All layers are the same insulation
- The total insulation thickness is not greater than the maximum FM Approved thickness of the insulation
- The mechanical fastening and wind uplift rating are per the FM Approval of the top layer
- The roof cover/insulation/fastener combination is FM Approved.

\*\*Water Based Bonding Adhesive-P (WBBA-P) is the equivalent to Water Based Bonding Adhesive-S (WBBA-S)\*\*

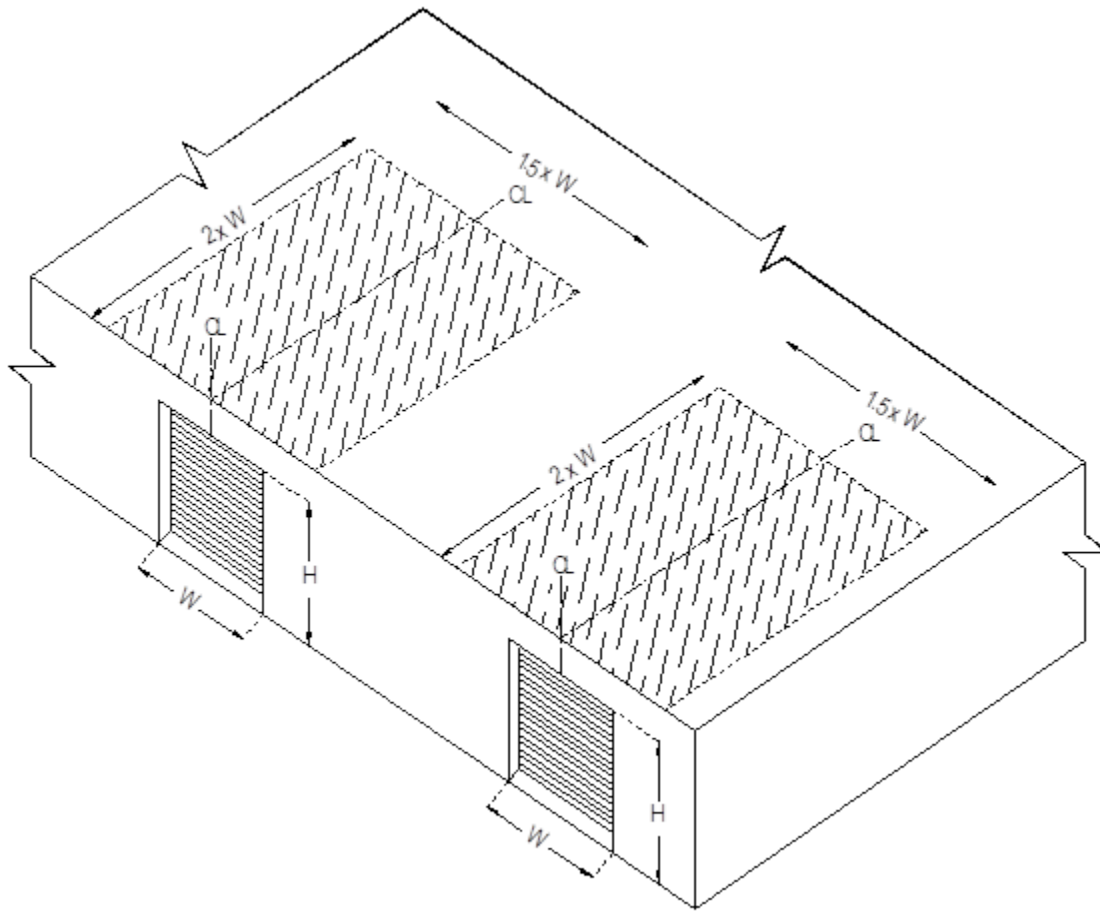
### Large Wall Opening Enhancement

ASCE 7 should be consulted to determine the appropriate building configuration, enclosed, partially enclosed or open. The building configuration impacts the appropriate design and attachment required for the roofing system. If an existing building is altered, adding large openings, change of use, etc., adjustments may need to be made to accommodate the changes.

The large wall opening enhancement is required when the sum of the various opening areas (w x h) is greater than 10% of the wall area.

Perimeter ½ sheets are required in the hatched area as shown in the diagram below. It is common installation practice to extend the perimeter along this entire building plan dimension to accommodate this rule, but it not required. For warranty purposes Holcim finds it acceptable to utilize battens, plates, and fasteners or Invisiweld attachment methods for this enhancement. (See diagram below.)





## Factory Mutual (FM) Hail Ratings

Use FM RoofNav to find properly rated roof assemblies. The following information has been referenced from the FM Global Property Loss Prevention Data Sheet (LPDS) 1-34. FM recommends using a different hail rated assemblies determined by the projects location. Reference the map provided (Fig. C-1) to determine which rating may be required for your FM insured project. Install the FM Approved roof according to the RoofNav listing and the manufacturer's instructions. Perimeter flashing while not carrying a hail rating should be installed in accordance with LPDS 1-49, Perimeter Flashing. It is the responsibility of the building owner to validate the project meets the local building code requirements.

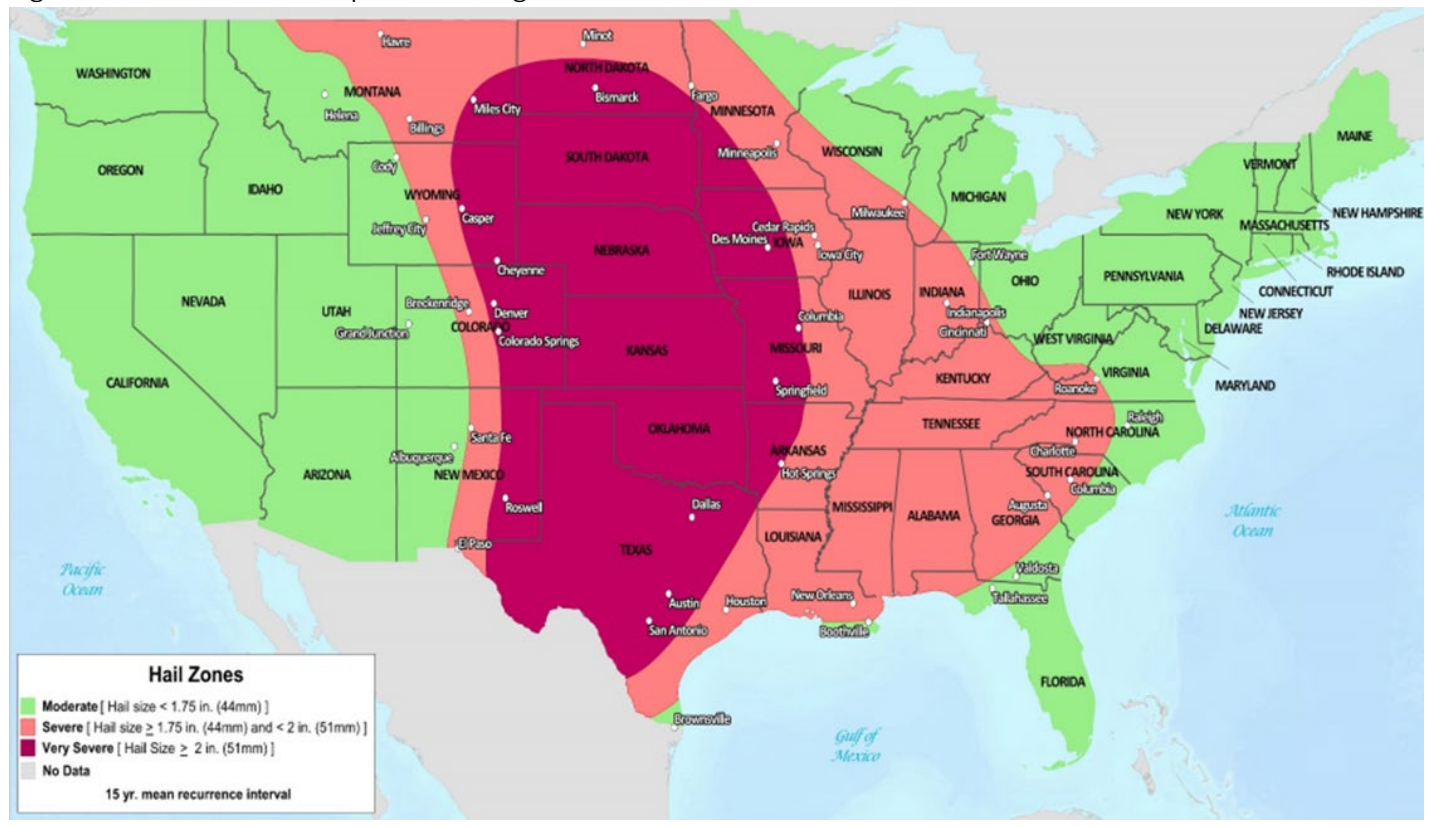
### FM Hail Ratings

Hail Hazard Area	Roof Assembly Type	FM Approval Rating
Very Severe Hail (VSH)	Poured concrete or concrete paver covered roof <sup>1,2</sup>	N/A
	Any FM Approved Roof	VSH
Severe Hail (SH)	Any FM Approved Roof	VSH, SH, FM Class 3, or FM Class 4
	Poured concrete, concrete paver or aggregate (stone) covered roof <sup>1,2</sup>	N/A
Moderate Hail (MH)	Any FM Approved Roof	VSH, SH, FM Class 3, or FM Class 4
	Poured concrete, concrete paver or aggregate (stone) covered roof <sup>1,2</sup>	

#### NOTE:

1. Follow Data Sheet 1-29, Roof Deck Securement and Above-Deck Roof Components, for use and restrictions on concrete pavers and aggregate (stone).
2. Concrete pavers meeting ASTM C1491-18, Standard Specification for Concrete Roof Pavers, or equivalent standard outside the US.

Fig. C-1 – Hailstorm Hazard Map for the Contiguous United States



**FM – Very Severe Hail**

The VHS Listings – Fully Adhered TPO with Adhered DensDeck StormX Prime Cover Board table has been provided at the end of this document. This table lists options that qualify for Very Severe Hail (VSH) ratings from FM Approvals. This table does not represent the full spectrum of assemblies available and FM Approvals and RoofNav.com should be consulted for a full list of qualifying assemblies.

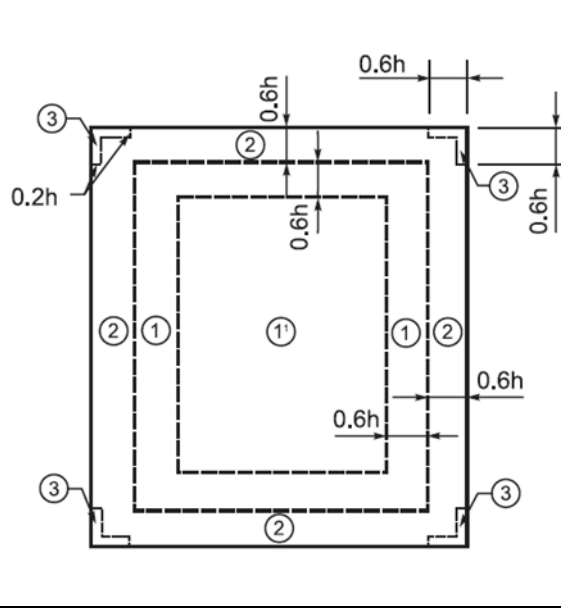
**Factory Mutual (FM) – Roof Zone Definition**

The following diagrams are referenced from the FM Global Property Lost Prevention Data Sheets 1-28 and 1-29. This outlines how to determine the minimum required roof zone areas based on the building size and relative conditions.

## Roof Zone Layout Based on Building Height

**NOTE:**

If a parapet with a minimum height of 3 ft (0.9 m) is provided around the entire perimeter, Zone 2 values may be used in Zone 3. For low-slope roofs  $\leq 7^\circ$  (1.5 in./ft. slope) and  $h \leq 60$  ft (18 m), or  $h < 90$  ft (27 m) and  $h/w \leq 1.0$ , the roof can be divided into four zones as a function of  $h$ , where  $h$  = the mean roof height.



**Zone 3 (Corner):**  
The roof corners, with L-shaped dimension =  $0.6h$  by  $0.6h$  by  $0.2h$ .

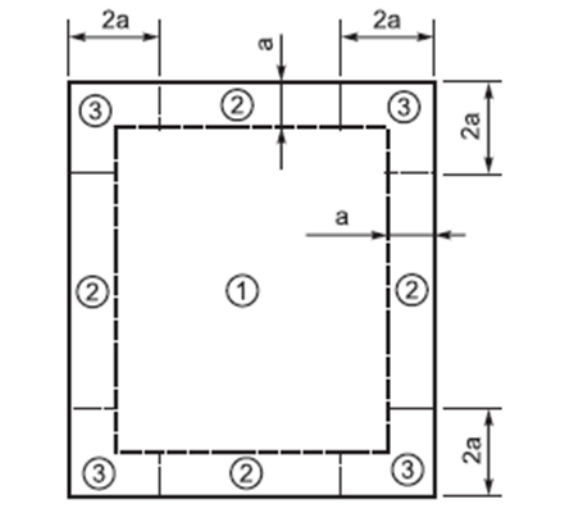
**Zone 2 (Perimeter):**  
The roof perimeter, inward from the roof edge, with rectangular dimension and width =  $0.6h$  from roof edges.

**Zone 1 (Field):**  
The field-of-roof (area inside corners and perimeter corners) up to a distance of  $1.2h$  from the roof perimeter.

**Zone 1' (Field Prime):**  
Applies to relatively wide buildings ( $> 2.4h$ ) and covers the remaining roof area inward from Zone 1.

**Example:** Roof height of 30'  
 $.6 \times 30' = 18'$   
 $.2 \times 30' = 6'$   
**Zone 3(Corner):**  $0.6 \times 30$  by  $0.6 \times 30$  by  $0.2 \times 30 = 18'$  by  $18'$  by  $6'$   
**Zone 2 (Perimeter):**  $0.6 \times 30 = 18'$   
**Zone 1 (Field):**  $0.6 \times 30 = 18'$   
**Zone 1' (Field Prime):** Covers the remaining roof area inward from Zone 1.

Roof Slopes  $\leq 7^\circ$  (1.5 in./ft slope) and  $h > 60$  ft (18 m) for  $h/w > 1.0$ ; or  $h \geq 90$  ft (27.4 m) for  $h/w \leq 1.0$ , the roof can be divided into three zones as a function of  $a$ , where  $a = 10\%$  of the lesser plan dimension, but not less than 3 ft (0.9 m).



**Zone 3(Corner):**  
The roof corners, with L-shaped dimension =  $2a$  by  $2a$  by  $a$ .

**Zone 2 (Perimeter):**  
The roof perimeter zone width dimension =  $a$  width in from roof edges.

**Zone 1 (Field):**  
The field-of-roof (area inside corners and perimeter areas) is the remainder of the roof area.

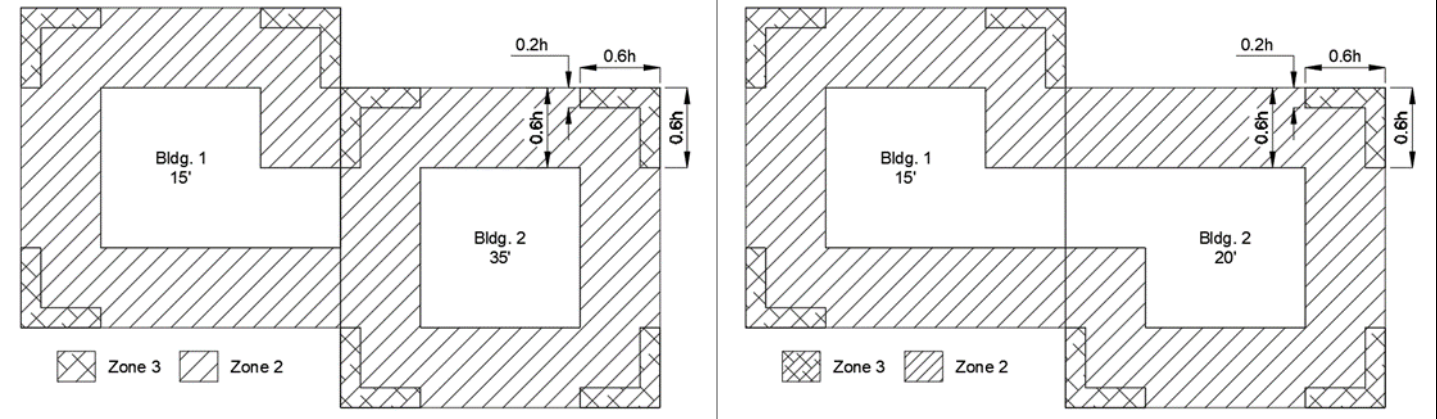
**Example:** Roof size and height of 55' x 55' x 65'  
 $10\% \text{ of } 55' = 5.5'$   
 $a = 5.5'$   
**Zone 3(Corner):**  $2 \times 5.5'$  by  $2 \times 5.5'$  by  $5.5' = 11'$  by  $11'$  by  $5.5'$   
**Zone 2 (Perimeter):**  $5.5'$   
**Zone 1 (Field):** Remainder of roof area

**Roof Slopes  $> 7^\circ$  ( $> 1.5''$ )**

For roof slopes  $> 7^\circ$  ( $> 1.5''$ ), depending on the slope. The width ( $a$ ) of the various perimeter and corner zones for these steeper sloped roofs equals the lesser of 10% of the building width or  $0.4h$ , but not less than 4% of the width or 3 ft (0.9 m). See FM Global Property Loss Prevention Data Sheet 1-28 for your specific conditions.

## Roof Elevation Changes

Elevation Change of $\geq 10$ ft	Elevation Change of $< 10$ ft
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<p>Where the difference in roof elevations between abutting buildings or building sections is greater than or equal to 10 ft (3.0 m), treat abutting areas of the higher building as perimeter and corner areas in accordance with figure shown above.</p>	<p>Where the difference in roof elevations between abutting buildings is less than 10 ft (3.0 m), follow guidance in figure shown above. The perimeter and field zones continue from one roof to the other. The buildings must be abutting for this to apply.</p>
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**NOTE:** The buildings do not abut if there is any horizontal separation.

## Factory Mutual (FM) – Prescriptive Enhancement Options – Perimeter and Corner

### Adhered Membrane – Insulation Enhancements (choose one):

<b>Option 1:</b>	Use a system that is rated adequate for Zone 3 in all areas of the roof.
<b>Option 2:</b>	Prescriptive enhancements for Zones 2 and 3
<b>Limitations:</b>	<ul style="list-style-type: none"> <li>▪ Zone 1 rating in any location does not exceed Class 1-90</li> <li>▪ Building is in non-tropical cyclone-prone region and Zone 1 rating does not exceed Class 1-105</li> </ul>

For either of the above conditions, increase the securement over the Zone 1 rating as follows:

### Mechanically Securement of Insulation Enhancement

#### Assemblies using insulation fasteners, enhance as follows:

<b>Zone 2:</b>	Increase number of fasteners per board by 50% minimum, but at least one fastener per 2 ft <sup>2</sup>
<b>Zone 3:</b>	Install one fastener per 1 ft <sup>2</sup>

**NOTE:** Round up to the next whole fasteners if necessary

### Adhesive Securement of Insulation Enhancement

#### Components adhered with adhesives applied in ribbons, spots, etc.:

<b>Zone 2:</b>	Install rows not more than 67% of the Zone 1 spacing between rows, or area
<b>Zone 3:</b>	Install rows not more than 50% of the Zone 1 spacing between rows, or area

**NOTE:** Round the bead spacing down to the next whole number. 8.71 in o.c. beads spacing would be rounded down to 8 in o.c.

## Mechanically Attached Membrane Securement Enhancement

Mechanically Attached Membrane – Membrane Securement Enhancements – In Seam	
Prescriptively enhance by reducing the distance between rows of roof cover fasteners and stress plates or batten bars from the Zone 1 spacing using the following:	
<b>Zone 2:</b>	Ensure distance between rows is not more than 67% of the FM approved spacing used for Zone 1
<b>Zone 3:</b>	Ensure distance between rows is not more than 50% of the FM approved spacing used for Zone 1
<b>NOTE:</b> For metal decks install all rows of roof cover fasteners perpendicular to the ribs of the roof deck to better distribute the wind load and prevent deck failure.	
<b>Example:</b> A 75 psf rated assembly using a 10' sheet size for Zone 1 (Field), decrease the row spacing for Zone 2 (Perimeter) by no more than 67% and Zone 3 (Corner) by no more than 50% of the field sheet span. (Always round down.)	
<b>Zone 1 (Field):</b> 10' Sheets at 114" o.c. rows of fasteners	
<b>Zone 2 (Perimeter):</b> 114" rows x .67 = 76.38" rows = Max 76" o.c. rows	
<b>Zone 3 (Corner):</b> 114" rows x .5 = 57.5" rows = Max 57" o.c. rows	

## InvisiWeld Securement Enhancement

Invisiweld Attached Membrane – Membrane Securement Enhancements	
Prescriptively enhance by reducing the distance between rows of roof cover fasteners and stress plates from the Zone 1 spacing using the following:	
<b>Zone 2:</b>	Decrease spacing between fastener points in one or both directions. Ensure the total tributary area to each fastener is not more than 67% of the FM approved spacing used for Zone 1
<b>Zone 3:</b>	Decrease spacing between fastener points in one or both directions. Ensure the total tributary area to each fastener is not more than 50% of the FM approved spacing used for Zone 1
<b>NOTE:</b> Pre-securement of the insulation may be required. See tested assembly for validation. When rows of fasteners are used Install all rows of roof cover fasteners perpendicular to the ribs of the roof deck to better distribute the wind load and prevent deck failure.	
<b>Example:</b> <b>Zone 1:</b> 24" x 24" pattern (6 fasteners per board or a tributary area of 4 sq. ft. per fastener) <b>Zone 2:</b> 16" x 24" pattern (12 fasteners per board or a tributary area of 2.68 sq. ft. per fastener) Due to rib spacing you may need: 12" x 24" pattern (14 per board or tributary area of 2.28 sq. ft. per fastener) <b>Zone 3:</b> 12" x 24" pattern (tributary area of 2 sq. ft. per fastener)	

## Base Sheet Attachment Over FM Approved Deck Types

The table below outlines the options for prescriptive enhancement options for base sheet attachment over FM approved deck types. For non-FM approved deck types, like wood, see FM Global Property Loss Prevention Data Sheet 1-29, Section 2.2.10.14.4.

Base Sheet – Mechanically Attached (choose one):	
<b>Option 1:</b>	Use assembly that is rated to meet/exceed Zone 3 across the whole roof.
<b>Option 2:</b>	Use assembly that is rated to meet/exceed each zone.
<b>Option 3:</b>	Reduce the spacing between rows of fasteners by using one intermediate row in Zone 2 and Zone 3.
<b>Option 4:</b>	Reduce the area per fasteners to no more than 67% of the FM approved spacing in Zone 2, and not more than 50% of the FM approved spacing in zone 3.
<b>NOTE:</b>	
<ul style="list-style-type: none"> <li>Install fasteners that engage lightweight insulating concrete (LWIC) no closer than 4 in. (100 mm) on center to avoid cracking the LWIC.</li> <li>When ribbed deck, such as steel deck is used, the fastener spacing within fastener rows must be in even multiples of the deck rib spacing (6 in. [150 mm] for 1-1/2" [38 mm] deep deck) to ensure the fastener engages the top deck flange.</li> <li>To adequately distribute the wind load to the roof deck and its securement and prevent deck buckling and deck securement failure, install fastener rows perpendicular to the deck ribs.</li> </ul>	

## Mechanically Attached Membrane – Preliminary Insulation Securement

The table below provides the minimum preliminary insulation fastening rate required for systems using a mechanically attached membrane. Note the rates may differ based on the use or a vapor retarder, different building enclosure classification and building Zone 1 (Field) pressure rating.

Preliminary Insulation Securement for Fastened in the Seam MFSP's				
Vapor Retarder	Building Enclosure Classification	Maximum Required Zone 1 Pressure Rating (P), psf (kPa)	Fastener Requirements for Insulation or Cover Boards up to 4 x 4 ft (1.2 x 1.2 m) board	Fastener Requirements for Insulation or Cover Boards up to 4 x 8 ft (1.2 x 2.4 m) board
No	Enclosed or Partially Enclosed	No Limit	Minimum 2 per board	Minimum 4 per board
Yes	Enclosed	P = 60 (2.9)	Minimum 2 per board	Minimum 4 per board
Yes	Partially Enclosed	P = 60 (2.9)	Minimum 4 per board	Minimum 5 per board
Yes	Enclosed or Partially Enclosed	60 < P ≤ 90 (2.9 < P ≤ 4.3)	Minimum 4 per board	Minimum 5 per board
Yes	Enclosed	90 < P ≤ 300 (4.3 < P ≤ 14.4)	Minimum 4 per board	Minimum 8 per board
Yes	Partially Enclosed	90 < P ≤ 300 (4.3 < P ≤ 14.4)	Minimum 6 per board	Minimum 12 per board
Yes	Enclosed	P > 300 (14.4)	Minimum 6 per board	Minimum 12 per board
Yes	Partially Enclosed	P > 300 (14.4)	Minimum 8 per board	Minimum 16 per board

**NOTE:** Table 6 does not apply to roof assemblies with air barriers. Where air barriers are used, more stringent guidelines may be required in RoofNav and those must be followed.

## ASCE 7 – Basic Wind Speeds for Risk/Occupancy Category

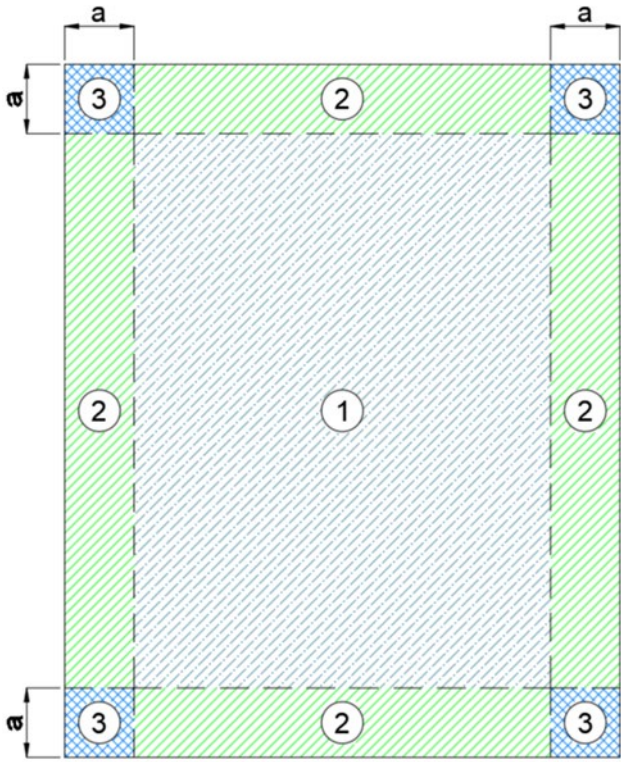
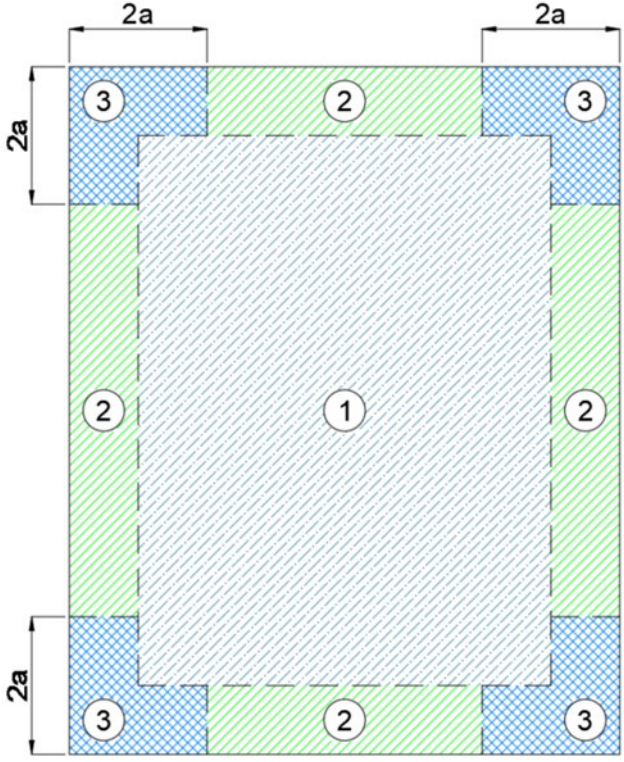
The American Society of Civil Engineers (ASCE) provides basic wind speed maps based on Occupancy/Risk Category of buildings. Refer to the appropriate version of the ASCE for wind maps specific to the building's occupancy category. These maps can be found in the specific editions of the ASCE and can be found at [www.atcouncil.org/windspeed](http://www.atcouncil.org/windspeed). Locations that fall within a special wind region should be reviewed by an engineer to validate the full scope of the project's requirements.

### ASCE - American Society of Civil Engineers - Roof Zones – ASCE 7-10 (IBC 2015/2012)

ASCE 7-10 offers basic wind speed maps for occupancy categories I, II, III and IV. In this edition of the ASCE Occupancy Category III and IV are combined on the same map, while categories I and II have their own maps. In this edition three maps are provided based on Occupancy/Risk Category. This version of the ASCE uses a more generalized approach to the areas of the county where most of the county falls within one wind speed and the coastal areas are more defined with contour lines and varying wind speeds.

### ASCE 7-10 Perimeter and Corner Definition - Examples

The diagram below is an example only. Each building type and shape may require its own specific layout for perimeters and corners. ASCE 7-10 should be consulted for nonstandard building/roof types and shapes.

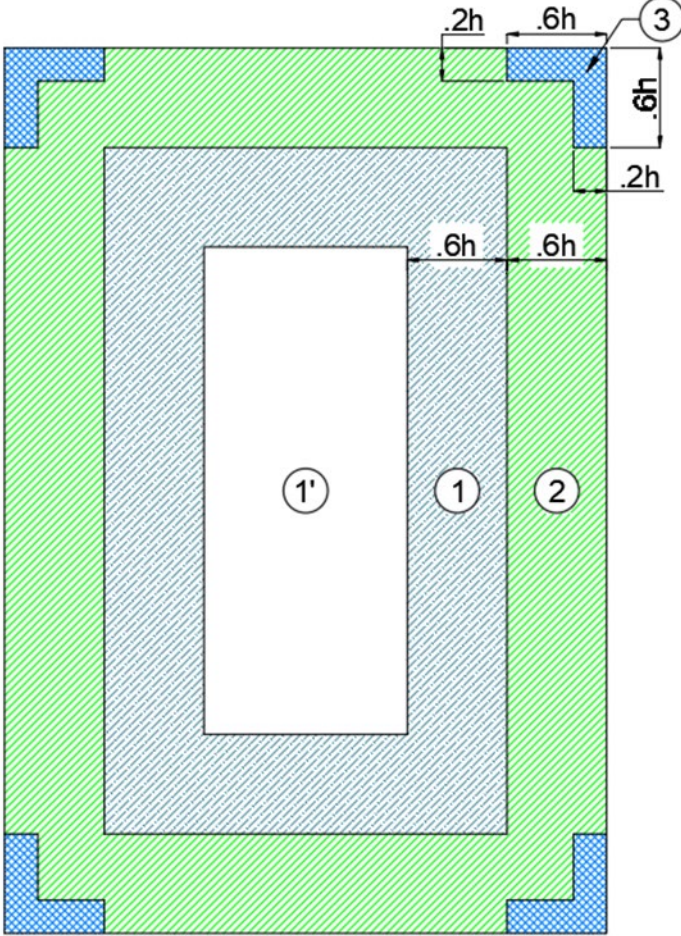
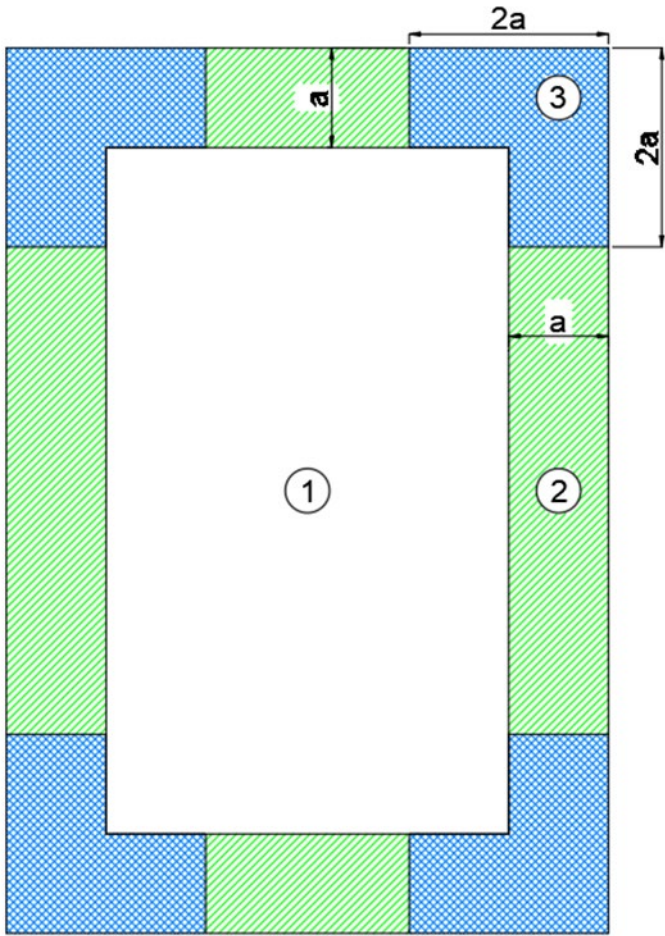
Roof Heights Where $h \leq 60$ ft.	Roof Heights Where $h > 60$ ft.
	
<p><b>Notation:</b>  <math>a = 10</math> percent of least horizontal dimension or <math>0.4h</math>, whichever is smaller, but not less than either 4% of least horizontal dimension or 3 ft (0.9 m).  <math>h =</math> Eave height shall be used for <math>\theta \leq 10^\circ</math>.  <math>\theta =</math> Angle of plane of roof from horizontal, in degrees.</p>	<p><b>Notation:</b>  <math>a = 10</math> percent of least horizontal dimension, but not less than 3 ft (0.9 m).  <math>h =</math> Eave height shall be used for <math>\theta \leq 10^\circ</math>.  <math>\theta =</math> Angle of plane of roof from horizontal, in degrees.</p>

### ASCE 7-16 (IBC 2018)

ASCE 7-16 offers basic wind speed maps for occupancy categories I, II, III and IV. In this edition of the ASCE all Occupancy/Risk Categories have been defined on their own maps. In this edition four maps are provided based on Occupancy/Risk Category. This version of the ASCE uses more detailed contour lines throughout the map showing more accurate wind speed estimates.

### ASCE 7-16 Perimeter and Corner Definition – Examples

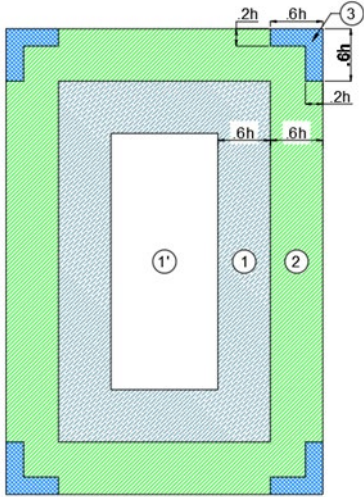
Data referenced from ASCE/SEI 7-16 Minimum Design Loads and Associated Criteria for Buildings and Other Structures. All referenced information should be validated against the current document and local relevant building codes. Roof zones may change based on actual building size/layout and roof type. See ASCE documents to validate zones based on building conditions.

Roof Heights Where $h \leq 60$ ft.	Roof Heights Where $h > 60$ ft.
	
<p>Roof Zone Layout Example for Building Height <math>\leq 60'</math> (Roof Slope <math>\leq 1.5'' (7^\circ)</math>) <math>h</math> = Roof Height</p>	<p>Roof Zone Layout Example for Building Heights <math>&gt; 60'</math> (Roof Slope <math>\leq 1.5'' (7^\circ)</math>) <math>a</math> = 10% of least horizontal dimension, but not less than 3 ft (0.9 m).</p>
<p><b>Example:</b> Building Height = 30 ft .6h = 18 ft .2h = 6 ft <b>Zone 3:</b> 18' x 18' x 6'; <b>Zone 2:</b> 18'; <b>Zone 1:</b> 18'; <b>Zone 1':</b> Remainder</p>	<p><b>Example:</b> <b>Building Dimensions:</b> 80' x 200' <b>Least Horizontal Dimension:</b> 80' <math>a = 8'</math> <math>2a = 16'</math> <b>Zone 3:</b> 16' x 16' x 8'; <b>Zone 2:</b> 8'; <b>Zone 1:</b> Remainder</p>



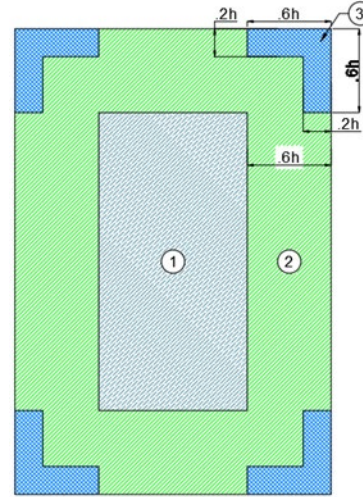
**ASCE 7-16 - Potential Zone Layouts Based on Building Ratio Scenario**

The figures below have been referenced from the ASCE 7-16 standard. (Figure C30-1)



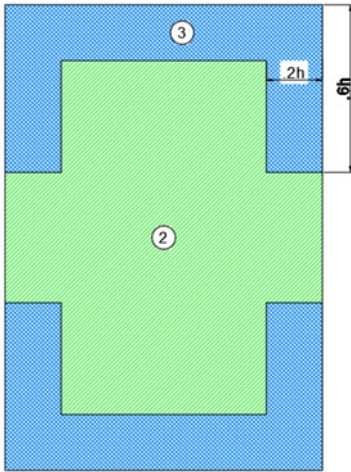
Buildings with least horizontal dimension greater than 2.4h.

**Example:** 600' x 1,000' x 30' = .2h: 6' & .6h: 18'  
**Zone 3:** 18' x 18' x 6'  
**Zone 2:** 8' wide from roof edge  
**Zone 1:** 8' wide in from Zone 2  
**Zone 1':** Remainder



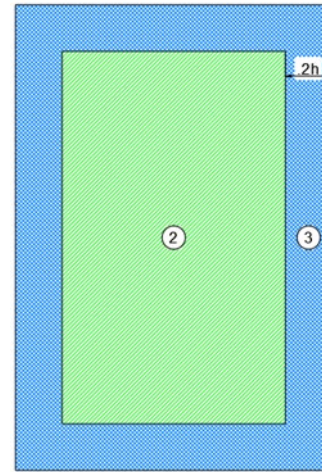
Buildings with least horizontal dimension greater than 1.2h but less than 2.4h.

**Example:** 50' x 100' x 30' = .2h: 6' & .6h: 18'  
**Zone 3:** 18' x 18' x 6'  
**Zone 2:** 18' wide from roof edge  
**Zone 1:** Remainder



Buildings with least horizontal dimension less than 1.2h and largest horizontal dimension greater than 1.2h.

**Example:** 30' x 50' x 30' = .2h: 6' & .6h: 18'  
**Zone 3:** 6' wide from roof edge, 18' legs  
**Zone 2:** Remainder



Building with largest horizontal dimension less than 1.2h.

**Example:** 20' x 20' x 20' = .2h: 4'  
**Zone 3:** 4' wide from roof edge  
**Zone 2:** Remainder

**When the greatest horizontal dimension is less than 0.4h, the whole roof area is considered Zone 3.**

## FM Approvals RoofNav Assemblies

### UltraPly TPO – Adhered Membrane – Steel Deck – Gypsum Cover Board (Attached) – ISO (CF)

60 PSF

**Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil)

**Attachment:** Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or Water Based Bonding Adhesive P

RoofNav #: 112787-0-0	Cover Board	DensDeck		Securock	
		½" min.		½" min.	
Slope: 2.5"	Attachment	10 Heavy-Duty Fasteners and Plates			
Uplift: 60 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
Internal Fire: 1		1.5" - 12"	1.5" - 12"	2.3" - 13"	2.3" - 13"
External Fire: A	Attachment	CF			
	Vapor Retarder	<b>Optional:</b> 4-6 mil Poly or V-Force over ¼" DensDeck			
Hail: SH	Deck	22 – 16 ga., 72" max span, 33 ksi			

**Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil)

**Attachment:** Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or Water Based Bonding Adhesive P

RoofNav #: 422548-0-0	Cover Board	DensDeck		Securock	
		½" min.		½" min.	
Slope: 2.5"	Attachment	10 Heavy-Duty Fasteners and Plates			
Uplift: 60 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
Internal Fire: 1		1.5" - 24"	1.5" - 24"	2.3" - 13"	2.3" - 13"
External Fire: A	Attachment	CF			
	Vapor Retarder	V-Force with Primer over ½" min. DensDeck			
Hail: SH	Deck	22 – 16 ga., 72" max span, 33 ksi			

**Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil)

**Attachment:** Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or Water Based Bonding Adhesive P

RoofNav #: 112793-0-0	Cover Board	DensDeck		Securock	
		¼" min.		½" min.	
Slope: 2.5"	Attachment	12 Heavy-Duty Fasteners and Plates			
Uplift: 60 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
Internal Fire: 1		1.5" - 12"	1.5" - 12"	2.3" - 13"	2.3" - 13"
External Fire: A	Attachment	CF			
	Vapor Retarder	<b>Optional:</b> 4-6 mil Poly or V-Force over ¼" DensDeck			
Hail: SH	Deck	22 – 16 ga., 72" max span, 33 ksi			

**Membrane:** UltraPly TPO (45, 60 or 80 mil); latinum (45, 60 or 80 mil)

**Attachment:** Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or Water Based Bonding Adhesive P

RoofNav #: 422552-0-0	Cover Board	DensDeck		Securock	
		¼" min.		½" min.	
Slope: 2.5"	Attachment	12 Heavy-Duty Fasteners and Plates			
Uplift: 60 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
Internal Fire: 1		1.5" - 24"	1.5" - 24"	2.3" - 13"	2.3" - 13"
External Fire: A	Attachment	CF			
	Vapor Retarder	V-Force with Primer over ½" min. DensDeck			
Hail: SH	Deck	22 – 16 ga., 72" max span, 33 ksi			

## 90 PSF

**Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil); TPO SA

**Attachment:** Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or Water Based Bonding Adhesive P

RoofNav #: 388101-0-0	Cover Board	DensDeck			
		½" min.			
Slope: 2.5"	Attachment	8 Heavy-Duty Fasteners and Plates			
Uplift: 90 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
Internal Fire: 1		1.5" - 12"	1.5" - 12"	2.3" - 13"	2.3" - 13"
External Fire: A	Attachment	CF			
Hail: SH	Deck	22 - 16 ga., 72" max span, 33 ksi			

**Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil)

**Attachment:** Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or Water Based Bonding Adhesive P

RoofNav #: 112802-0-0	Cover Board	DensDeck			
		⅝" min.			
Slope: 2.5"	Attachment	8 Heavy-Duty Fasteners and Plates			
Uplift: 90 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
Internal Fire: 1		1.5" - 12"	1.5" - 12"	2.3" - 13"	2.3" - 13"
External Fire: A	Attachment	CF			
	Vapor Retarder	<b>Optional:</b> 4-6 mil Poly or V-Force over ¼" DensDeck			
Hail: SH	Deck	22 - 16 ga., 72" max span, 33 ksi			

**Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil)

**Attachment:** Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or Water Based Bonding Adhesive P

RoofNav #: 422555-0-0	Cover Board	DensDeck			
		⅝" min.			
Slope: 2.5"	Attachment	8 Heavy-Duty Fasteners and Plates			
Uplift: 90 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
Internal Fire: 1		1.5" - 24"	1.5" - 24"	2.3" - 13"	2.3" - 13"
External Fire: A	Attachment	CF			
	Vapor Retarder	V-Force and Primer over ¼" DensDeck			
Hail: SH	Deck	22 - 16 ga., 72" max span, 33 ksi			

**Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil)

**Attachment:** Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or Water Based Bonding Adhesive P

RoofNav #: 422554-0-0	Cover Board	DensDeck			
		¼" min.			
Slope: 2.5"	Attachment	18 Heavy-Duty Fasteners and Plates			
Uplift: 90 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
Internal Fire: 1		1.5" - 24"	1.5" - 24"	2.3" - 13"	2.3" - 13"
External Fire: A	Attachment	CF			
	Vapor Retarder	V-Force and Primer over ¼" DensDeck			
Hail: SH	Deck	22 - 16 ga., 72" max span, 33 ksi			

Membrane: UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil)

Attachment: Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or Water Based Bonding Adhesive P

RoofNav #: 112805-0-0	Cover Board	DensDeck		Securock	
		¼" min.		½" min.	
Slope: 2.5"	Attachment	12 Heavy-Duty Fasteners and Plates			
Uplift: 90 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1.5" - 12"	1.5" - 12"	2.3" - 13"	2.3" - 13"
Internal Fire: 1	Attachment	CF			
External Fire: A	Vapor Retarder	<b>Optional:</b> 4-6 mil Poly or V-Force over ¼" DensDeck			
Hail: SH	Deck	22 - 16 ga., 72" max span, 33 ksi			

Membrane: UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil)

Attachment: Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or Water Based Bonding Adhesive P

RoofNav #: 2067-0-0	Cover Board	DensDeck		Securock	
		¼" min.		¼" min.	
Slope: 2.5"	Attachment	18 Heavy-Duty Fasteners and Plates			
Uplift: 90 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1" - 12"	1" - 12"	2.3" - 13"	2.3" - 13"
Internal Fire: 1	Attachment	CF			
External Fire: A	Vapor Retarder	<b>Optional:</b> 4-6 mil Poly or V-Force over ¼" DensDeck			
Hail: SH	Deck	22 - 16 ga., 72" max span, 33 ksi			

Membrane: UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil)

Attachment: Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or Water Based Bonding Adhesive P

RoofNav #: 422556-0-0	Cover Board	DensDeck		Securock	
		¼" min.		½" min.	
Slope: 2.5"	Attachment	12 Heavy-Duty Fasteners and Plates			
Uplift: 90 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1" - 24"	1" - 24"	2.3" - 13"	2.3" - 13"
Internal Fire: 1	Attachment	CF			
External Fire: A	Vapor Retarder	<b>Optional:</b> 4-6 mil Poly or V-Force over ¼" DensDeck			
Hail: SH	Deck	22 - 16 ga., 72" max span, 33 ksi			

Membrane: UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil)

Attachment: Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or Water Based Bonding Adhesive P

RoofNav #: 419151-0-0	Cover Board	DensDeck		Securock	
		½" min.		½" min.	
Slope: 2.5"	Attachment	18 Heavy-Duty Fasteners and Plates			
Uplift: 90 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1" - 24"	1" - 24"	2.3" - 13"	2.3" - 13"
Internal Fire: 1	Attachment	CF			
External Fire: A	Vapor Retarder	V-Force and Primer over ¼" DensDeck			
Hail: SH	Deck	22 - 16 ga., 72" max span, 33 ksi			

### 105 PSF

**Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil); TPO SA

**Attachment:** Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or Water Based Bonding Adhesive P

RoofNav #: 394344-0-0	Cover Board	DensDeck Prime			
		¼" min.			
Slope: 2.5"	Attachment	18 Heavy-Duty Fasteners and Plates			
Uplift: 105 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1.5" - 12"	1.5" - 12"	2.3" - 13"	2.3" - 13"
Internal Fire: 1	Attachment	CF			
External Fire: A	Vapor Retarder	<b>Optional:</b> 4-6 mil Poly or V-Force over ¼" DensDeck			
Hail: SH	Deck	22 - 18 ga., Wide Rib, 72" max span, 33 ksi			

**Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil); TPO SA

**Attachment:** Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or Water Based Bonding Adhesive P

RoofNav #: 424390-0-0	Cover Board	DensDeck Prime			
		¼" min.			
Slope: 2.5"	Attachment	18 Heavy-Duty Fasteners and Plates			
Uplift: 105 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1.5" - 24"	1.5" - 24"	2.3" - 13"	2.3" - 13"
Internal Fire: 1	Attachment	CF			
External Fire: A	Vapor Retarder	V-Force and Primer over ¼" DensDeck			
Hail: SH	Deck	22 - 18 ga., Wide Rib, 72" max span, 33 ksi			

### 135 PSF

**Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil); TPO SA

**Attachment:** Single-Ply LVOC Bonding Adhesive or Single-Ply LVOC Bonding Adhesive 1168

RoofNav #: 395478-0-0	Cover Board	DensDeck Prime			
		½" min.			
Slope: 2.5"	Attachment	18 Heavy-Duty Fasteners and Plates			
Uplift: 135 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1.5" - 12"	1.5" - 12"	2.3" - 13"	2.3" - 13"
Internal Fire: 1	Attachment	CF			
External Fire: A	Vapor Retarder	<b>Optional:</b> 4-6 mil Poly or V-Force over ¼" DensDeck			
Hail: SH	Deck	22 - 18 ga., Wide Rib, 72" max span, 33 ksi			

**Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil); TPO SA

**Attachment:** Single-Ply LVOC Bonding Adhesive or Single-Ply LVOC Bonding Adhesive 1168

RoofNav #: 424393-0-0	Cover Board	DensDeck Prime			
		½" min.			
Slope: 2.5"	Attachment	18 Heavy-Duty Fasteners and Plates			
Uplift: 105 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1.5" - 24"	1.5" - 24"	2.3" - 13"	2.3" - 13"
Internal Fire: 1	Attachment	CF			
External Fire: A	Vapor Retarder	V-Force and Primer over ½" DensDeck			
Hail: SH	Deck	22 - 18 ga., Wide Rib, 72" max span, 33 ksi			

**150 PSF**

**Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil); TPO SA

**Attachment:** Single-Ply LVOC Bonding Adhesive or Single-Ply LVOC Bonding Adhesive 1168

RoofNav #: 395479-0-0	Cover Board	DensDeck Prime			
		½" min.			
Slope: 2.5"	Attachment	20 Heavy-Duty Fasteners and Plates			
Uplift: 150 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1.5" - 12"	1.5" - 12"	2.3" - 13"	2.3" - 13"
Internal Fire: 1	Attachment	CF			
External Fire: A	Vapor Retarder	<b>Optional:</b> 4-6 mil Poly or V-Force over ¼" DensDeck			
Hail: SH	Deck	22 - 18 ga., Wide Rib, 72" max span, 33 ksi			

**Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil); TPO SA

**Attachment:** Single-Ply LVOC Bonding Adhesive or Single-Ply LVOC Bonding Adhesive 1168

RoofNav #: 424395-0-0	Cover Board	DensDeck Prime			
		½" min.			
Slope: 2.5"	Attachment	20 Heavy-Duty Fasteners and Plates			
Uplift: 150 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1.5" - 24"	1.5" - 24"	2.3" - 13"	2.3" - 13"
Internal Fire: 1	Attachment	CF			
External Fire: A	Vapor Retarder	V-Force and Primer over ½" DensDeck			
Hail: SH	Deck	22 - 18 ga., Wide Rib, 72" max span, 33 ksi			

**Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil); TPO SA

**Attachment:** Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or UltraPly Bonding Adhesive

RoofNav #: 423201-0-0	Cover Board	DensDeck Prime	Securock
		½" min.	½"
Slope: 2.5"	Attachment	20 Heavy-Duty Fasteners and Plates	
Uplift: 150 psf	Insulation	ISO 95+ GL (F/T)	ISOGARD GL (F/T)
		1.5" - 24"	2.3" - 13"
Internal Fire: 1	Attachment	CF	
External Fire: A	Vapor Retarder	V-Force and Primer over ¼" DensDeck	
Hail: SH	Deck	22 - 18 ga., Wide Rib, 72" max span, 33 ksi	

**Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil); TPO SA

**Attachment:** Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or UltraPly Bonding Adhesive

RoofNav #: 200412-0-0	Cover Board	DensDeck Prime	Securock
		½" min.	½" min.
Slope: 2.5"	Attachment	24 Heavy-Duty Fasteners and Plates	
Uplift: 150 psf	Insulation	ISO 95+ GL (F/T)	ISOGARD GL (F/T)
		1.5" - 12"	2.3" - 13"
Internal Fire: 1	Attachment	CF	
External Fire: A	Vapor Retarder	<b>Optional:</b> 4-6 mil Poly or V-Force over ¼" DensDeck	
Hail: SH	Deck	22 - 18 ga., Wide Rib, 72" max span, 33 ksi	

**165 PSF****Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil)**Attachment:** Single-Ply LVOC Bonding Adhesive or Single-Ply LVOC Bonding Adhesive 1168

RoofNav #: 388008-0-0	Cover Board	DensDeck Prime	
		½" min.	
Slope: 2.5"	Attachment	32 Heavy-Duty Fasteners and Plates	
Uplift: 165 psf	Insulation	ISO 95+ GL	ISOGARD GL
		1.5" - 12"	2.3" - 13"
Internal Fire: 1	Attachment	CF	
External Fire: A	Deck	22 - 18 ga., Wide Rib, 72" max span, 33 ksi	
Hail: SH			

**Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil); TPO SA**Attachment:** Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or UltraPly Bonding Adhesive

RoofNav #: 427091-0-0	Cover Board	DensDeck Prime	Securock
		½" min.	½" min.
Slope: 2.5"	Attachment	32 Heavy-Duty Fasteners and Plates	
Uplift: 165 psf	Insulation	ISO 95+ GL (F/T)	ISOGARD GL (F/T)
		1.5" - 12"	2.3" - 13"
Internal Fire: 1	Attachment	CF	
External Fire: A	Vapor Retarder	V-Force and Primer over ½" DensDeck	
Hail: SH	Deck	22 - 18 ga., Wide Rib, 72" max span, 33 ksi	

**210 PSF****Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil)**Attachment:** Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or UltraPly Bonding Adhesive

RoofNav #: 200414-0-0	Cover Board	DensDeck Prime	Securock
		½" min.	½" min.
Slope: 2.5"	Attachment	32 Heavy-Duty Fasteners and Plates	
Uplift: 210 psf	Insulation	ISO 95+ GL (F/T)	ISOGARD GL (F/T)
		1.5" - 12"	2.3" - 13"
Internal Fire: 1	Attachment	CF	
External Fire: A	Vapor Retarder	<b>Optional:</b> 4-6 mil Poly or V-Force over ¼" DensDeck	
Hail: SH	Deck	22 ga., Wide Rib, 64" max span, 33 ksi 20 - 18 ga., Wide Rib, 72" max span, 33 ksi 22 - 18 ga., Wide Rib, 72" max span, 80 ksi	

**Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil)**Attachment:** Single-Ply LVOC Bonding Adhesive, Single-Ply LVOC Bonding Adhesive 1168 or UltraPly Bonding Adhesive

RoofNav #: 423202-0-0	Cover Board	DensDeck Prime	Securock
		½" min.	½" min.
Slope: 2.5"	Attachment	32 Heavy-Duty Fasteners and Plates	
Uplift: 210 psf	Insulation	ISO 95+ GL (F/T)	ISOGARD GL (F/T)
		1.5" - 24"	2.3" - 13"
Internal Fire: 1	Attachment	CF	
External Fire: A	Vapor Retarder	V-Force and Primer over ¼" DensDeck	
Hail: SH	Deck	22 ga., Wide Rib, 64" max span, 33 ksi 20 - 18 ga., Wide Rib, 72" max span, 33 ksi 22 - 18 ga., Wide Rib, 72" max span, 80 ksi	

**255 PSF**

**Membrane:** UltraPly TPO (45, 60 or 80 mil); Platinum (45, 60 or 80 mil)

**Attachment:** Single-Ply LVOC Bonding Adhesive or Single-Ply LVOC Bonding Adhesive 1168

RoofNav #: 388009-0-0	Cover Board	DensDeck Prime	
		½" min.	
Slope: 2.5"	Attachment	32 Heavy-Duty Fasteners and Plates	
Uplift: 255 psf	Insulation	ISO 95+ GL (F/T)	ISOGARD GL (F/T)
		1.5" - 12"	2.3" - 13"
Internal Fire: 1	Attachment	CF	
External Fire: A	Deck	22 - 18 ga., Wide Rib, 72" max span, 80 ksi	
Hail: SH			

**UltraPly TPO SA – Steel Deck – Insulation (CF) – Gypsum Cover Board (Attached)**

**60 PSF**

**Membrane:** UltraPly TPO SA (60 mil)

RoofNav #: 399227-0-0	Cover Board	DensDeck Prime	
		¼" min.	
Slope: 2.5"	Attachment	10 Heavy-Duty Fasteners and Plates	
Uplift: 60 psf	Insulation	ISO 95+ GL (F)	ISOGARD GL (F)
		1.5" - 12"	2.3" - 13"
Internal Fire: 1	Attachment	CF	
External Fire: A	Deck	22 - 18 ga., 72" max span, 33 ksi	
Hail: SH			

**75 PSF**

**Membrane:** UltraPly TPO SA (45 or 60 mil)

RoofNav #: 399257-0-0	Cover Board	DensDeck Prime	
		⅝" min.	
Slope: 2.5"	Attachment	6 Heavy-Duty Fasteners and Plates	
Uplift: 60 psf	Insulation	ISO 95+ GL (F)	ISOGARD GL (F)
		1.5" - 12"	2.3" - 13"
Internal Fire: 1	Attachment	CF	
External Fire: A	Deck	22 - 18 ga., 72" max span, 33 ksi	
Hail: SH			

**90 PSF**

**Membrane:** UltraPly TPO SA (45 or 60 mil)

RoofNav #: 271664-0-0	Cover Board	DensDeck Prime		Securock	
		¼" min.		½"	
Slope: 2.5"	Attachment	12 Heavy-Duty Fasteners and Plates			
Uplift: 90 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1.5" - 12"	1.5" - 12"	2.3" - 13"	2.3" - 13"
Internal Fire: 1	Attachment	CF			
External Fire: A	Vapor Barrier	<b>Optional:</b> 4-6 mil Poly or V-Force over ¼" DensDeck			
Hail: SH	Deck	22 - 16 ga., 72" max span, 33 ksi			

**Membrane:** UltraPly TPO SA (45 or 60 mil)

RoofNav #: 315025-0-0	Cover Board	DensDeck Prime		Securock	
		½" min.		½" min.	
Slope: 2.5"	Attachment	12 Heavy-Duty Fasteners and Plates			
Uplift: 90 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1.5" - 12"	1.5" - 12"	2.3" - 13"	2.3" - 13"
Internal Fire: 1		<b>NOTE:</b> Maximum total thickness of insulation below DenDeck Prime cover board is 12".			
	Attachment	CF			



External Fire: A	Vapor Barrier	V-Force and Primer over min. ¼" DensDeck or min. ⅜" Securock		
Hail: SH	Deck	22 - 16 ga., 72" max span, 33 ksi		

**Membrane: UltraPly TPO SA (45 or 60 mil)**

RoofNav #: 423205-0-0 Slope: 2.5" Uplift: 90 psf Internal Fire: 1 External Fire: A Hail: SH	Cover Board	DensDeck Prime		Securock	
		¼" min.		½" min.	
	Attachment	12 Heavy-Duty Fasteners and Plates			
	Insulation	ISO 95+ GL (T)	Resista (F/T)	ISOGARD GL (T)	ISOGARD CG (F/T)
		½" - 20"	½" - 20"	2.3" - 13"	2.3" - 13"
	Attachment	CF			
	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1.5" - 4"	1.5" - 4"	2.3" - 13"	2.3" - 13"
Attachment	CF				
Vapor Barrier	V-Force and Primer over min. ¼" DensDeck				
Deck	22 - 16 ga., 72" max span, 33 ksi				

**Membrane: UltraPly TPO SA (45 or 60 mil)**

RoofNav #: 426127-0-0 Slope: 2.5" Uplift: 90 psf Internal Fire: 1 External Fire: A Hail: SH	Cover Board	DensDeck Prime		Securock	
		¼" min.		½" min.	
	Attachment	12 Heavy-Duty Fasteners and Plates			
	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1.5" - 24"	1.5" - 24"	2.3" - 13"	2.3" - 13"
	Attachment	CF			
	Vapor Barrier	V-Force and Primer over min. ¼" DensDeck			
	Deck	22 - 16 ga., 72" max span, 33 ksi			

**105 PSF**

**Membrane: UltraPly TPO SA (45 or 60 mil)**

RoofNav #: 394344-0-0 Slope: 2.5" Uplift: 105 psf Internal Fire: 1 External Fire: A Hail: SH	Cover Board	DensDeck Prime			
		¼" min.			
	Attachment	18 Heavy-Duty Fasteners and Plates			
	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1.5" - 12"	1.5" - 12"	2.3" - 13"	2.3" - 13"
	Attachment	CF			
	Vapor Barrier	<b>Optional:</b> 4-6 mil Poly, Basegard SA (Primer) or V-Force (Primer) over ¼" DensDeck			
	Deck	22 - 18 ga., Wide Rib, 72" max span, 33 ksi			

**Membrane: UltraPly TPO SA (45 or 60 mil)**

RoofNav #: 424390-0-0 Slope: 2.5" Uplift: 105 psf Internal Fire: 1 External Fire: A Hail: SH	Cover Board	DensDeck Prime			
		¼" min.			
	Attachment	18 Heavy-Duty Fasteners and Plates			
	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1.5" - 24"	1.5" - 24"	2.3" - 13"	2.3" - 13"
	Attachment	CF			
	Vapor Barrier	V-Force and Primer over ½" DensDeck			
	Deck	22 - 18 ga., Wide Rib, 72" max span, 33 ksi			

**135 PSF**

**Membrane: UltraPly TPO SA (45 or 60 mil)**

RoofNav #: 395478-0-0 Slope: 2.5" Uplift: 135 psf Internal Fire: 1	Cover Board	DensDeck Prime			
		½" min.			
	Attachment	18 Heavy-Duty Fasteners and Plates			
	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1.5" - 12"	1.5" - 12"	2.3" - 13"	2.3" - 13"
Attachment	CF				

External Fire: A	Vapor Barrier	<b>Optional:</b> 4-6 mil Poly, Basegard SA (Primer) or V-Force (Primer) over ¼" DensDeck			
Hail: SH	Deck	22 - 18 ga., Wide Rib, 72" max span, 33 ksi			

**Membrane:** UltraPly TPO SA (45 or 60 mil)

RoofNav #: 424393-0-0	Cover Board	DensDeck Prime			
		½" min.			
Slope: 2.5"	Attachment	18 Heavy-Duty Fasteners and Plates			
Uplift: 135 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1.5" - 24"	1.5" - 24"	2.3" - 13"	2.3" - 13"
Internal Fire: 1	Attachment	CF			
External Fire: A	Vapor Barrier	Basegard SA and Primer or V-Force and Primer over ¼" DensDeck			
Hail: SH	Deck	22 - 18 ga., Wide Rib, 72" max span, 33 ksi			

**150 SF**

**Membrane:** UltraPly TPO SA (45 or 60 mil)

RoofNav #: 395479-0-0	Cover Board	DensDeck Prime			
		½" min.			
Slope: 2.5"	Attachment	20 Heavy-Duty Fasteners and Plates			
Uplift: 150 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1.5" - 12"	1.5" - 12"	2.3" - 13"	2.3" - 13"
Internal Fire: 1	Attachment	CF			
External Fire: A	Vapor Barrier	<b>Optional:</b> 4-6 mil Poly, Basegard SA (Primer) or V-Force (Primer) over ¼" DensDeck			
Hail: SH	Deck	22 - 18 ga., Wide Rib, 72" max span, 33 ksi			

**Membrane:** UltraPly TPO SA (45 or 60 mil)

RoofNav #: 200412-0-0	Cover Board	DensDeck Prime		Securock	
		½" min.		½" min.	
Slope: 2.5"	Attachment	20 Heavy-Duty Fasteners and Plates			
Uplift: 150 psf	Insulation	ISO 95+ GL (F/T)		ISOGARD GL (F/T)	
		1.5" - 12"		2.3" - 13"	
Internal Fire: 1	Attachment	CF			
External Fire: A	Vapor Barrier	<b>Optional:</b> 4-6 mil Poly, Basegard SA (Primer) or V-Force (Primer) over ¼" DensDeck			
Hail: SH	Deck	22 - 18 ga., Wide Rib, 72" max span, 33 ksi			

**Membrane:** UltraPly TPO SA (45 or 60 mil)

RoofNav #: 424395-0-0	Cover Board	DensDeck Prime			
		½" min.			
Slope: 2.5"	Attachment	20 Heavy-Duty Fasteners and Plates			
Uplift: 150 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1.5" - 12"	1.5" - 12"	2.3" - 13"	2.3" - 13"
Internal Fire: 1	Attachment	CF			
External Fire: A	Vapor Barrier	V-Force and Primer over ½" DensDeck			
Hail: SH	Deck	22 - 18 ga., Wide Rib, 72" max span, 33 ksi			

**Membrane:** UltraPly TPO SA (45 or 60 mil)

RoofNav #: 423201-0-0	Cover Board	DensDeck Prime		Securock	
		½" min.		½" min.	
Slope: 2.5"	Attachment	24 Heavy-Duty Fasteners and Plates			
Uplift: 150 psf	Insulation	ISO 95+ GL (F/T)		ISOGARD GL (F/T)	
		1.5" - 24"		2.3" - 13"	
Internal Fire: 1	Attachment	CF			

External Fire: A Hail: SH	Vapor Barrier	V-Force and Primer over ¼" DensDeck		
	Deck	22 – 18 ga., Wide Rib, 72" max span, 33 ksi		

**165 SF**

**Membrane:** UltraPly TPO SA (45 or 60 mil)

RoofNav #: 328645-0-0	Cover Board	DensDeck Prime	Securock	
		½" min.		
Slope: 2.5"	Attachment	32 Heavy-Duty Fasteners and Plates		
Uplift: 165 psf	Insulation	ISO 95+ GL (F/T)	ISOGARD GL (F/T)	
		1.5" - 12"	2.3" - 13"	
Internal Fire: 1	Attachment	CF		
External Fire: A	Vapor Barrier	<b>Optional:</b> 4-6 mil Poly or V-Force (Primer) over ¼" DensDeck		
Hail: SH	Deck	22 – 18 ga., Wide Rib, 72" max span, 33 ksi		

**Membrane:** UltraPly TPO SA (45 or 60 mil)

RoofNav #: 427091-0-0	Cover Board	DensDeck Prime	Securock	
		½" min.		
Slope: 2.5"	Attachment	32 Heavy-Duty Fasteners and Plates		
Uplift: 165 psf	Insulation	ISO 95+ GL (F/T)	ISOGARD GL (F/T)	
		1.5" - 24"	2.3" - 13"	
Internal Fire: 1	Attachment	CF		
External Fire: A	Vapor Barrier	V-Force and Primer over ½" DensDeck		
Hail: SH	Deck	22 – 18 ga., Wide Rib, 72" max span, 33 ksi		

**180 SF**

**Membrane:** UltraPly TPO SA (45 or 60 mil)

RoofNav #: 373422-0-0	Cover Board	DensDeck Prime	Securock	
		½" min.		
Slope: 2.5"	Attachment	32 Heavy-Duty Fasteners and Plates		
Uplift: 180 psf	Insulation	ISO 95+ GL (F/T)	ISOGARD GL (F/T)	
		1.5" - 12"	2.3" - 13"	
Internal Fire: 1	Attachment	CF		
External Fire: A	Vapor Barrier	<b>Optional:</b> 4-6 mil Poly or V-Force (Primer) over ¼" DensDeck		
Hail: SH	Deck	20 – 18 ga., Wide Rib, 72" max span, 33 ksi;	22 ga., Wide Rib, 64" max span, 33 ksi;	22 – 18 ga., Wide Rib, 72" max span, 80 ksi

**Membrane:** UltraPly TPO SA (45 or 60 mil)

RoofNav #: 424593-0-0	Cover Board	DensDeck Prime	Securock	
		½" min.		
Slope: 2.5"	Attachment	32 Heavy-Duty Fasteners and Plates		
Uplift: 180 psf	Insulation	ISO 95+ GL (F/T)	ISOGARD GL (F/T)	
		1.5" - 24"	2.3" - 13"	
Internal Fire: 1	Attachment	CF		
External Fire: A	Vapor Barrier	V-Force and Primer over ½" DensDeck		
Hail: SH	Deck			

	Deck	20 - 18 ga., Wide Rib, 72" max span, 33 ksi;	22 ga., Wide Rib, 64" max span, 33 ksi;	22 - 18 ga., Wide Rib, 72" max span, 80 ksi
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**255 SF**

**Membrane:** UltraPly TPO SA (45 or 60 mil)

RoofNav #: 387917-0-0	Cover Board	DensDeck Prime
Slope: 2.5"		1/2" min.
Uplift: 255 psf	Attachment	32 Heavy-Duty Fasteners and Plates
Internal Fire: 1	Insulation	ISO 95+ GL (F/T)
External Fire: A	Attachment	1.5" - 12"
Hail: SH	Attachment	CF
	Deck	22 - 18 ga., Wide Rib, 72" max span, 80 ksi

## UltraPly TPO XR – Steel Deck – Insulation (CF) – Gypsum Cover Board (Attached)

90 PSF

Membrane: UltraPly TPO XR (100, 115 or 135 mil)

RoofNav #: 292006-0-0	Adhesive	I.S.O. Spray R	Twin Jet	XR Stick
	Attachment	12" o.c.	6" o.c. or Spatter	12" o.c.
Slope: 2"	Cover Board	DensDeck Prime		Securock
		1/4" min.		1/4" min.
Uplift: 90 psf	Attachment	16 Heavy-Duty Fasteners and Plates		
	Insulation	ISO 95+ GL (T) 1/2" - 4"	Resista (F/T) 1/2" - 4"	ISOGARD GL (T) 2.3" - 13"
Internal Fire: 1	Attachment	CF	CF	CF
	Insulation	ISO 95+ GL (F/T) 1.5" - 4"	Resista (F/T) 1.5" - 4"	ISOGARD GL (F/T) 2.3" - 13"
External Fire: A	Attachment	CF	CF	CF
	Vapor Retarder	<b>Optional:</b> 4-6 mil Poly or V-Force over 1/4" DensDeck		
Hail: SH	Deck	22 - 16 ga., 72" max span, 33 ksi		

Membrane: UltraPly TPO XR (100, 115 or 135 mil)

RoofNav #: 292007-0-0	Adhesive	I.S.O. Spray R	Twin Jet	XR Stick
	Attachment	12" o.c.	6" o.c. or Spatter	12" o.c.
Slope: 2"	Cover Board	DensDeck Prime		Securock
		1/4" min.		1/4" min.
Uplift: 90 psf	Attachment	16 Heavy-Duty Fasteners and Plates		
	Insulation	ISO 95+ GL (F/T) 1.5" - 12"	Resista (F/T) 1.5" - 12"	ISOGARD GL (F/T) 2.3" - 13"
Internal Fire: 1	Attachment	CF	CF	CF
	Vapor Retarder	<b>Optional:</b> 4-6 mil Poly or V-Force over 1/4" DensDeck		
Hail: SH	Deck	22 - 16 ga., 72" max span, 33 ksi		

Membrane: UltraPly TPO XR (100 or 115 mil)

Attachment: XR Bonding Adhesive

RoofNav #: 243482-0-0	Cover Board	DensDeck Prime		Securock
		1/4" min.		1/2" min.
Slope: 4"	Attachment	12 Heavy-Duty Fasteners and Plates		
	Insulation	ISO 95+ GL (F/T) 1.5" - 12"	Resista (F/T) 1.5" - 12"	ISOGARD GL (F/T) 2.3" - 13"
Internal Fire: 1	Attachment	CF	CF	CF
	Vapor Retarder	<b>Optional:</b> 4-6 mil Poly or V-Force over 1/4" DensDeck		
Hail: SH	Deck	22 - 16 ga., 72" max span, 33 ksi		

Membrane: UltraPly TPO XR (135 mil)

Attachment: XR Bonding Adhesive

RoofNav #: 344866-0-0	Cover Board	DensDeck Prime		Securock
		1/4" min.		1/2" min.
Slope: 1"	Attachment	12 Heavy-Duty Fasteners and Plates		
	Insulation	ISO 95+ GL (F/T) 1.5" - 12"	Resista (F/T) 1.5" - 12"	ISOGARD GL (F/T) 2.3" - 13"
Internal Fire: 1	Attachment	CF	CF	CF
	Vapor Retarder	<b>Optional:</b> 4-6 mil Poly or V-Force over 1/4" DensDeck		
Hail: SH	Deck	22 - 16 ga., 72" max span, 33 ksi		

**Membrane:** UltraPly TPO XR (100, 115 or 135 mil)

RoofNav #: 426513-0-0	Adhesive	I.S.O. Spray R	Twin Jet	XR Stick	
	Attachment	12" o.c.	6" o.c. or Spatter	12" o.c.	
Slope: 2"	Cover Board	DensDeck Prime		Securock	
		¼" min.		¼" min.	
Uplift: 90 psf	Attachment	16 Heavy-Duty Fasteners and Plates			
		ISO 95+ GL (T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
Internal Fire: 1	Insulation	½" - 20"	½" - 20"	2.3" - 13"	2.3" - 13"
		Attachment	CF	CF	CF
External Fire: A	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		Attachment	1.5" - 4"	1.5" - 4"	2.3" - 13"
Hail: SH	Vapor Retarder Deck	CF	CF	CF	CF
		V-Force and Primer over ¼" DensDeck 22 - 16 ga., 72" max span, 33 ksi			

**Membrane:** UltraPly TPO XR (100, 115 or 135 mil)

RoofNav #: 426514-0-0	Adhesive	I.S.O. Spray R	Twin Jet	XR Stick	
	Attachment	12" o.c.	6" o.c. or Spatter	12" o.c.	
Slope: 2"	Cover Board	DensDeck Prime		Securock	
		¼" min.		¼" min.	
Uplift: 90 psf	Attachment	16 Heavy-Duty Fasteners and Plates			
		CF	CF	CF	CF
Internal Fire: 1	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		Attachment	1.5" - 24"	1.5" - 24"	2.3" - 13"
External Fire: A	Vapor Retarder Deck	CF	CF	CF	CF
		V-Force and Primer over ¼" DensDeck 22 - 16 ga., 72" max span, 33 ksi			

**Membrane:** UltraPly TPO XR (100 or 115 mil)

**Attachment:** XR Bonding Adhesive

RoofNav #: 424918-0-0	Cover Board	DensDeck Prime		Securock	
		¼" min.		½" min.	
Slope: 4"	Attachment	12 Heavy-Duty Fasteners and Plates			
Uplift: 90 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		Attachment	1.5" - 24"	1.5" - 24"	2.3" - 13"
Internal Fire: 1	Vapor Retarder Deck	CF	CF	CF	CF
		V-Force and Primer over ¼" DensDeck 22 - 16 ga., 72" max span, 33 ksi			

**Membrane:** UltraPly TPO XR

**Attachment:** XR Bonding Adhesive

RoofNav #: 428072-0-0	Cover Board	DensDeck Prime		Securock	
		¼" min.		½" min.	
Slope: 1"	Attachment	12 Heavy-Duty Fasteners and Plates			
Uplift: 90 psf	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		Attachment	1.5" - 24"	1.5" - 24"	2.3" - 13"
Internal Fire: 1	Vapor Retarder Deck	CF	CF	CF	CF
		V-Force and Primer over ½" DensDeck 22 - 16 ga., 72" max span, 33 ksi			

**Membrane: UltraPly TPO XR (100, 115 or 135 mil)**

RoofNav #: 388264-0-0	Adhesive	Twin Jet		XR Stick	
	Attachment	6" o.c. or Spatter		4" o.c.	
Slope: 2"	Cover Board	DensDeck Prime			
		1/2" min.			
Uplift: 90 psf	Attachment	8 Heavy-Duty Fasteners and Plates			
Internal Fire: 1	Insulation	ISO 95+ GL (F/T)	Resista (F/T)	ISOGARD GL (F/T)	ISOGARD CG (F/T)
		1.5" - 12"	1.5" - 12"	2.3" - 13"	2.3" - 13"
External Fire: A	Attachment	CF	CF	CF	CF
	Vapor Retarder	V-Force and Primer over 1/4" DensDeck			
Hail: SH	Deck	22 - 18 ga., 72" max span, 33 ksi			

**165 PSF**

**Membrane: UltraPly TPO XR (100, 115 or 135 mil)**

RoofNav #: 388004-0-0	Adhesive	Twin Jet		XR Stick	
	Attachment	6" o.c. or Spatter		4" o.c.	
Slope: 2"	Cover Board	DensDeck Prime			
		1/2" min.			
Uplift: 165 psf	Attachment	32 Heavy-Duty Fasteners and Plates			
Internal Fire: 1	Insulation	ISO 95+ GL (F)		ISOGARD GL (F)	
		1.5" - 12"		2.3" - 13"	
External Fire: A	Attachment	CF	CF	CF	CF
	Vapor Retarder	V-Force and Primer over 1/4" DensDeck			
Hail: SH	Deck	22 - 18 ga., Wide Rib, 72" max span, 33 ksi			

**255 PSF**

**Membrane: UltraPly TPO XR (100, 115 or 135 mil)**

RoofNav #: 388005-0-0	Adhesive	Twin Jet		XR Stick	
	Attachment	6" o.c. or Spatter		4" o.c.	
Slope: 2"	Cover Board	DensDeck Prime			
		1/2" min.			
Uplift: 255 psf	Attachment	32 Heavy-Duty Fasteners and Plates			
Internal Fire: 1	Insulation	ISO 95+ GL (F)		ISOGARD GL (F)	
		1.5" - 12"		2.3" - 13"	
External Fire: A	Attachment	CF	CF	CF	CF
	Vapor Retarder	V-Force and Primer over 1/4" DensDeck			
Hail: SH	Deck	22 - 18 ga., Wide Rib, 72" max span, 80 ksi			

**Adhered UltraPly TPO direct to ISO 95+ GL – Mechanically Attached – Steel Deck**

Uplift	Deck	Vapor/ Thermal	Insulation	Insulation Attachment	Membrane Options	Membrane Attachment	RoofNav #
1-75  IF: 1 EF: A Slope: 1/4"	Steel: 22-16-ga. 33 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over 1/4" DensDeck	1"-12" thick ISO 95+ GL Tapered I.S.O. RESISTA/ ISOGARD CG	Min. 12 HD fasteners per 4'x8' boards	45-80 mil. UltraPly TPO UltraPly TPO SA EZ TPO	Single-Ply LVOC Single-Ply LVOC (1168) UltraPly Bonding Water Based Bonding SA – Self- Adhered	319480-0-0
1-90  IF: 1 EF: A Slope: 1/4"	Steel: 22-16-ga. 33 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over 1/4" DensDeck	2"-12" thick ISO 95+ GL Tapered I.S.O. RESISTA/ ISOGARD CG	Min. 8 HD fasteners per 4'x8' boards	45-80 mil. UltraPly TPO UltraPly TPO SA EZ TPO	Single-Ply LVOC Single-Ply LVOC (1168) UltraPly Bonding SA – Self-Adhered	400255-0-0
1-120  IF: 1 EF: A Slope: 1/4"	Steel: 22-18-ga. 33 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over 1/4" DensDeck	1.5"-12" thick ISO 95+ GL Tapered I.S.O.	Min. 18 HD fasteners per 4'x8' boards	45-80 mil. UltraPly TPO UltraPly TPO SA EZ TPO	Single-Ply LVOC Single-Ply LVOC (1168) UltraPly Bonding SA – Self-Adhered	400214-0-0

Adhered UltraPly TPO direct to ISO 95+ GL – Mechanically Attached – Steel Deck - Continued

Uplift	Deck	Vapor/ Thermal	Insulation	Insulation Attachment	Membrane Options	Membrane Attachment	RoofNav #
1-135  IF: 1 EF: A Slope: ¼"	Steel: 22-18-ga. 33 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over ¼" DensDeck	2"-12" thick ISO 95+ GL Tapered I.S.O.	Min. 16 HD fasteners per 4'x8' boards	45-80 mil. UltraPly TPO UltraPly TPO SA EZ TPO	Single-Ply LVOC Single-Ply LVOC (1168) UltraPly Bonding SA – Self-Adhered	400278-0-0
1-150  IF: 1 EF: A Slope: ¼"	Steel: 22-18-ga. 33 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over ¼" DensDeck	2"-12" thick ISO 95+ GL Tapered I.S.O.	Min. 20 HD fasteners per 4'x8' boards	45-80 mil. UltraPly TPO UltraPly TPO SA EZ TPO	Single-Ply LVOC (1168) UltraPly Bonding SA – Self-Adhered	400276-0-0
1-165  IF: 1 EF: A Slope: ¼"	Steel: 22-18-ga. 33 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over ¼" DensDeck	1.5"-12" thick ISO 95+ GL Tapered I.S.O.	Min. 24 HD fasteners per 4'x8' boards	45-80 mil. UltraPly TPO UltraPly TPO SA EZ TPO	Single-Ply LVOC (1168) UltraPly Bonding SA – Self-Adhered	400692-0-0
1-180  IF: 1 EF: A Slope: ¼"	Steel: 20-18-ga. 72" span 33 ksi  22-ga. 69" span 33 ksi	Optional: 4/6 mil. Polyethylene or V-Force SA over ¼" DensDeck	1.5"-12" thick ISO 95+ GL Tapered I.S.O.	Min. 24 HD fasteners per 4'x8' boards	45-80 mil. UltraPly TPO UltraPly TPO SA EZ TPO	Single-Ply LVOC (1168) UltraPly Bonding SA – Self-Adhered	400275-0-0

Adhered UltraPly TPO direct to a Structodek Cover Board & Insulation Mech. Attached – Steel Deck

Uplift	Deck	Vapor/ Thermal	Insulation	Insulation Attachment	Membrane Options	Membrane Attachment	RoofNav #
1-75  IF: 1 EF: A Slope: ½"	Steel: 22-16-ga. 33 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over ¼" DensDeck	Cover Board: Min. ½" Structodek HD® Insulation: 1"-12" thick ISO 95+ GL Tapered I.S.O. RESISTA	Cover Board: Min. 12 HD fasteners per 4'x8' boards Insulation: Loose Laid	45-80 mil. UltraPly TPO EZ TPO	Single-Ply LVOC Single-Ply LVOC (1168) UltraPly Bonding Water Based Bonding	2063-0-0

Adhered UltraPly TPO direct to a ISOGARD HD Cover Board & Insulation Mech. Attached – Steel Deck

Uplift	Deck	Vapor/ Thermal	Insulation	Insulation Attachment	Membrane Options	Membrane Attachment	RoofNav #
1-90  IF: 1 EF: A Slope: ¼"	Steel: 22-16-ga. 33 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over ¼" DensDeck	Cover Board: ½" ISOGARD HD Insulation: 1.5"-12" thick ISO 95+ GL Tapered I.S.O. RESISTA	Cover Board: Min. 12 HD fasteners per 4'x8' boards Insulation: Loose Laid	45-80 mil. UltraPly TPO UltraPly TPO SA EZ TPO	Single-Ply LVOC Single-Ply LVOC (1168) UltraPly Bonding SA – Self-Adhered	233370-0-0
1-120  IF: 1 EF: A Slope: ¼"	Steel: 22-18-ga. 33 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over ¼" DensDeck	Cover Board: ½" ISOGARD HD Insulation: 1.5"- 4" thick ISO 95+ GL Tapered I.S.O. RESISTA	Cover Board: Min. 24 HD fasteners per 4'x8' boards Insulation: Loose Laid	45-80 mil. UltraPly TPO UltraPly TPO SA EZ TPO	Single-Ply LVOC Single-Ply LVOC (1168) UltraPly Bonding SA – Shelf- Adhered	290589-0-0



## Adhered UltraPly TPO direct to a OSB Cover Board & Insulation Mech. Attached – Steel Deck

Uplift	Deck	Vapor/ Thermal	Insulation	Insulation Attachment	Membrane Options	Membrane Attachment	RoofNav #
1-150  IF: 1 EF: A Slope: 1/2"	Steel: 22-18-ga. 33 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over 1/4" DensDeck	Cover Board: Min. 7/16" OSB Insulation: 1.5" -12" thick ISO 95+ GL Tapered I.S.O.	Cover Board: Min. 16 HD fasteners per 4'x8' boards Insulation: Loose Laid	45-80 mil. UltraPly TPO UltraPly TPO SA EZ TPO	Single-Ply LVOC Single-Ply LVOC (1168) UltraPly Bonding SA – Shelf- Adhered	77830-0-0
1-165  IF: 1 EF: A Slope: 1/2"	Steel: 22-18-ga. 33 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over 1/4" DensDeck	Cover Board: Min. 7/16" OSB Insulation: 1.5" -12" thick ISO 95+ GL Tapered I.S.O.	Cover Board: Min. 32 HD fasteners per 4'x8' boards Insulation: Loose Laid	45-80 mil. UltraPly TPO	Single-Ply LVOC (1168) UltraPly Bonding	328834-0-0
1-300  IF: 1 EF: A Slope: 1/2"	Steel: 22-18-ga. 80 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over 1/4" DensDeck	Cover Board: Min. 7/16" OSB Insulation: 1.5" -12" thick ISO 95+ GL Tapered I.S.O.	Cover Board: Min. 32 HD fasteners per 4'x8' boards Insulation: Loose Laid	45-80 mil. UltraPly TPO EZ TPO	Single-Ply LVOC (1168) UltraPly Bonding	171664-0-0

## Adhered UltraPly TPO direct to an Adhered Cover Board & Attached Insulation – Steel Deck

Uplift	Deck	Vapor/ Thermal	Insulation	Insulation Attachment	Membrane Options	Membrane Attachment	RoofNav #
1-75  IF: 1 EF: A Slope: 1/4"	Steel: 22-16-ga. 33 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over 1/4" DensDeck	Cover Board: 1/2" ISOGARD HD Insulation: 2"-12" thick ISO 95+ GL Tapered I.S.O. RESISTA	Cover Board: 12" o.c. bead I.S.O. Spray Twin Pack I.S.O. Stick/Twin Jet Insulation: Min. 8 HD Fasteners per 4'x8' boards	45-80 mil. UltraPly TPO UltraPly TPO SA Flex Adhered	Single-Ply LVOC Single-Ply LVOC (1168) UltraPly Bonding SA – Shelf- Adhered	387410-0-0
1-90  IF: 1 EF: A Slope: 1/4"	Steel: 22-16-ga. 33 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over 1/4" DensDeck	Cover Board: 1/2" ISOGARD HD Insulation: 1.5" -12" thick ISO 95+ GL Tapered I.S.O. RESISTA	Cover Board: 12" o.c. bead I.S.O. Spray Twin Pack Insulation: Min. 16 HD Fasteners per 4'x8' boards	45-80 mil. UltraPly TPO UltraPly TPO SA Flex Adhered	Single-Ply LVOC (1168) UltraPly Bonding SA – Shelf- Adhered	233373-0-0
1-90  IF: 1 EF: A Slope: 1/4"	Steel: 22-16-ga. 33 ksi 72" span	Optional: 1/4" minimum DensDeck DensDeck Prime Securock	Cover Board: 1/2" ISOGARD HD Insulation: 2.2"-12" thick ISO 95+ GL Tapered I.S.O. RESISTA	Cover Board: 12" o.c. bead I.S.O. Spray R Twin Pack Insulation: Min. 8 HD Fasteners per 4'x8' boards	45-80 mil. UltraPly TPO UltraPly TPO SA Flex Adhered	Single-Ply LVOC (1168) UltraPly Bonding SA – Shelf- Adhered	400915-0-0
1-90  IF: 1 EF: A Slope: 2.5"	Steel: 22-16-ga. 33 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over 1/4" DensDeck	Cover Board: Min. 1/4" thick DensDeck Prime/ Securock Insulation: 1.5" -12" thick ISO 95+ GL Tapered I.S.O.	Cover Board: 12" o.c. bead I.S.O. Spray R Twin Pack Insulation: Min. 16 HD Fasteners per 4'x8' boards	45-80 mil. UltraPly TPO UltraPly TPO SA Flex Adhered	Single-Ply LVOC (1168) UltraPly Bonding SA – Shelf- Adhered	400885-0-0

Adhered UltraPly TPO direct to an Adhered Cover Board & Attached Insulation – Steel Deck - Continued

Uplift	Deck	Vapor/ Thermal	Insulation	Insulation Attachment	Membrane Options	Membrane Attachment	RoofNav #
1-90  IF: 1 EF: A Slope: 2.5"	Steel: 22-16-ga. 33 ksi 72" span	Optional: ¼" minimum DensDeck DensDeck Prime Securock	Cover Board: Min. ½" thick DensDeck Prime/ Securock Insulation: 2.2"-12" thick ISO 95+ GL Tapered I.S.O.	Cover Board: 12" o.c. bead I.S.O. Spray R Twin Pack Insulation: Min. 8 HD Fasteners per 4'x8' boards	45-80 mil. UltraPly TPO UltraPly TPO SA Flex Adhered	Single-Ply LVOC Single-Ply LVOC (1168) UltraPly Bonding SA – Shelf- Adhered	384613-0-0
1-165  IF: 1 EF: A Slope: ¼"	Steel: 22-18-ga. 33 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over ¼" DensDeck	Cover Board: ½" ISOGARD HD  Insulation: 2"-8" thick ISO 95+ GL Tapered I.S.O.	Cover Board: 6" o.c. bead I.S.O. Spray R Twin Pack I.S.O. Stick/Twin Jet Insulation: Min. 20 HD Fasteners per 4'x8' boards	45-80 mil. UltraPly TPO UltraPly TPO SA Flex Adhered	Single-Ply LVOC Single-Ply LVOC (1168) UltraPly Bonding SA – Shelf- Adhered	342142-0-0
1-165  IF: 1 EF: A Slope: ¼"	Steel: 22-18-ga. 33 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over ¼" DensDeck	Cover Board: ½" ISOGARD HD  Insulation: 2"-12" thick ISO 95+ GL Tapered I.S.O.	Cover Board: 4" o.c. bead I.S.O. Spray R Twin Pack I.S.O.Stick/Twi n Jet Insulation: Min. 32 HD Fasteners per 4'x8' boards	45-80 mil. UltraPly TPO UltraPly TPO SA Flex Adhered	Single-Ply LVOC Single-Ply LVOC (1168) UltraPly Bonding SA – Shelf- Adhered	328437-0-0
1-165  IF: 1 EF: A Slope: 2.5"	Steel: 22-18-ga. 33 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over ¼" DensDeck	Cover Board: Min. ½" thick DensDeck Prime/ Securock Insulation: 2"-12" thick ISO 95+ GL Tapered I.S.O.	Cover Board: 4" o.c. bead I.S.O. Spray R Twin Pack I.S.O.Stick/ Twin Jet Insulation: Min. 32 HD Fasteners per 4'x8' boards	45-80 mil. UltraPly TPO UltraPly TPO SA Flex Adhered	Single-Ply LVOC Single-Ply LVOC (1168) UltraPly Bonding SA – Shelf- Adhered	328781-0-0
1-180  IF: 1 EF: A Slope: ¼"	Steel: 20-18-ga. 33 ksi 72" span  22-18 ga 80 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over ¼" DensDeck	Cover Board: ½" ISOGARD HD  Insulation: 2"-12" thick ISO 95+ GL Tapered I.S.O.	Cover Board: 4" o.c. bead I.S.O. Spray R Twin Pack I.S.O.Stick/ Twin Jet Insulation: Min. 32 HD Fasteners per 4'x8' boards	45-80 mil. UltraPly TPO UltraPly TPO SA Flex Adhered	Single-Ply LVOC Single-Ply LVOC (1168) UltraPly Bonding SA – Shelf- Adhered	320446-0-0

Adhered UltraPly TPO direct to an Adhered Cover Board & Attached Insulation – Steel Deck - Continued

Uplift	Deck	Vapor/ Thermal	Insulation	Insulation Attachment	Membrane Options	Membrane Attachment	RoofNav #
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1-210 IF: 1 EF: A Slope: 2.5"	Steel: 20-18-ga. 33 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over 1/4" DensDeck	Cover Board: Min. 1/2" thick DensDeck Prime/ Securock	Cover Board: 4" o.c. bead Twin Pack I.S.O.Stick/ Twin Jet Insulation: Min. 32 HD Fasteners per 4'x8' boards	45-80 mil. UltraPly TPO Flex Adhered	Single-Ply LVOC Single-Ply LVOC (1168) UltraPly Bonding	320420-0-0
	22-18-ga. 80 ksi 72" span		Insulation: 2"-12" thick ISO 95+ GL Tapered I.S.O.				
1-270 IF: 1 EF: A Slope: 1/4"	Steel: 22-18 ga 80 ksi 72" span	Optional: 4/6 mil. Polyethylene or V-Force SA over 1/4" DensDeck	Cover Board: 1/2" ISO GARD HD Insulation: 2"-8" thick ISO 95+ GL Tapered I.S.O.	Cover Board: 4" o.c. bead I.S.O. Spray R Twin Pack I.S.O.Stick/ Twin Jet Insulation: Min. 32 HD Fasteners per 4'x8' boards	45-80 mil. UltraPly TPO Flex Adhered	Single-Ply LVOC Single-Ply LVOC (1168) UltraPly Bonding SA – Shelf- Adhered	342147-0-0

### Adhered UltraPly TPO, adhered Cover Board and/or Insulation – V-Force/MA DensDeck – Steel Deck

Uplift	Deck	Vapor/ Thermal	Insulation	Insulation Attachment	Membrane Options	Membrane Attachment	RoofNav #
1-90 IF: 1 EF: A Slope: 1/4"	22-16-ga. 33 ksi 72" span	V-Force Primer Min. 1/4" DensDeck Min. 1/2" Securock Min. 8 HD fasteners per 4'x8' boards	Insulation: 1.5"-12" thick ISO 95+ GL Tapered I.S.O. RESISTA	Insulation: 12" o.c. bead I.S.O. Spray R Twin Pack I.S.O.Stick/Twi n Jet	45-80 mil. UltraPly TPO UltraPly TPO SA Flex Adhered	Single-Ply LVOC Single-Ply LVOC (1168) UltraPly Bonding SA – Shelf- Adhered	294762-0-0
1-90 IF: 1 EF: A Slope: 2.5"	22-16-ga. 33 ksi 72" span	V-Force Primer Min. 1/4" DensDeck Min. 1/2" Securock Min. 8 HD fasteners per 4'x8' boards	Cover Board: 1/4" min. DensDeck Prime/ Securock Insulation: 1.5"-12" thick ISO 95+ GL Tapered I.S.O. RESISTA	Cover Board & Insulation: 12" o.c. bead I.S.O. Spray R Twin Pack I.S.O.Stick/Twi n Jet	60-80 mil. UltraPly TPO Flex Adhered	Single-Ply LVOC (1168)	307312-0-0

### Adhered Uplift Ratings – V-Force Vapor Barrier System – Concrete Deck

Uplift	Deck	Thermal Barrier	Vapor Barrier	Insulation Assembly	Membrane Options	RoofNav #
1-90 IF: NC EF: A Slope: 1/4"	Concrete: (New or recover)	DensDeck/Securock, 1/4" min. 8 HD or Concrete Drive fasteners and plates per 4'x8' boards	Primed thermal barrier with V-Force	ISO 95+ GL 1.5" min., 4'x4' boards, Adhered at 12" o.c.: I.S.O. Spray R I.S.O. Twin Pack I.S.O.Stick/Twin Jet	UltraPly TPO: Single-Ply LVOC S.P. LVOC 1168 UltraPly Bonding UltraPly TPO SA	294593-0-0
1-90 IF: NC EF: A Slope: 1/4"	Concrete: Min. 2,500 psi Min. 2" thick	DensDeck, 1/4" min. Securock 1/2" min. 8 HD or Concrete Drive fasteners and plates per 4'x8' boards	Primed thermal barrier with V-Force	2 Layers - ISO 95+ GL (Flat or Tapered), 1.5" min., 4'x4' boards, Adhered at 12" o.c.: I.S.O. Spray R I.S.O. Twin Pack I.S.O.Stick/Twin Jet	UltraPly TPO Single-Ply LVOC S.P. LVOC 1168 UltraPly Bonding UltraPly TPO SA	294633-0-0

### Adhered Uplift Ratings – V-Force Vapor Barrier System – Concrete Deck – Continued

Uplift	Deck	Thermal Barrier	Vapor Barrier	Insulation Assembly	Membrane Options	RoofNav #
1-525	Concrete:	None	Primed substrate	Cover Board:	UltraPly TPO, FA	295461-0-0

IF: NC EF: A Slope: ¼"	Min. 2,500 psi Min. 2" thick		with V-Force	ISOGARD HD, ½" min., 4'x4' board, adhered with I.S.O.Stick/Twin Jet, I.S.O. Spray or Twin Pack at 12" o.c. Insulation: 2 Layers - ISO 95+ GL, 1.5" min., 4'x4' boards, adhered with I.S.O.Stick/Twin Jet, I.S.O. Spray or Twin Pack at 12" o.c.	with Single-Ply LVOC or UltraPly Bonding Adhesive Or UltraPly TPO SA	
1-525 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	None	Primed substrate with V-Force	Insulation: ISO 95+ GL, 1.5" min., 4'x4' boards Adhered at 12" o.c.: I.S.O. Spray R I.S.O. Twin Pack I.S.O.Stick/Twin Jet	UltraPly TPO: Single-Ply LVOC S.P. LVOC 1168 UltraPly Bonding	294948-0-0
1-525 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	None	Primed substrate with V-Force	Insulation: 2 Layers ISO 95+ GL, 1.5" min., 4'x4' boards, Adhered at 12" o.c.: I.S.O. Spray R I.S.O. Twin Pack I.S.O.Stick/Twin Jet	UltraPly TPO: Single-Ply LVOC S.P. LVOC 1168 UltraPly Bonding	294949-0-0
1-495 IF: NC EF: A Slope: 2.5"	Concrete: Min. 2,500 psi Min. 2" thick	None	Primed substrate with V-Force	Cover Board: DensDeck Prime or Securock ¼" min. Insulation: ISO 95+ GL, 1.5" min., 4'x4' boards Adhered at 12" o.c.: I.S.O. Spray R I.S.O. Twin Pack I.S.O.Stick/Twin Jet	UltraPly TPO: Single-Ply LVOC S.P. LVOC 1168 UltraPly Bonding UltraPly TPO SA	295522-0-0

**Adhered Uplift Ratings – SBS Vapor Barrier System – New Construction, Concrete Deck, Adhesively Attached Insulation and Cover Board**

Uplift	Deck	Vapor Retarder	Insulation and Attachment	Cover Board and Attachment	Membrane	Membrane Attachment	RoofNav #
1-465 IF: NC EF: A Slope: 2.5"	Concrete: Min. 2,500 psi Min. 2" thick	SBS Glass Torch Base SBS Poly Torch Base SBS Smooth Primer: Concrete Primer, Asphaltic	Tapered ISO 95+ GL, 1.5" min., 12" o.c. beads of Twin Pack Adhesive	Cover Board: ¼" min. DensDeck, DensDeck Prime, or Securock, 4'x4' boards, 12" o.c. beads of I.S.O. Spray or Twin Pack Adhesive	UltraPly TPO	UltraPly Bonding Adhesive or Single-Ply LVOC Bonding Adhesive	233200-0-0

**Concrete Deck, Adhesively Attached Insulation, Without Cover Board**

Uplift	Deck	Insulation	Insulation Attachment	Membrane	Membrane Attachment	RoofNav #
1-315 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	Insulation: ISO 95+ GL, 1.5"-36", 4'x4' boards	Adhered at 12" o.c.: I.S.O. Twin Pack Adhesive	UltraPly TPO SA	Self-Adhered	373348-0-0

**Concrete Deck, Adhesively Attached Insulation, Without Cover Board – Continued**

Uplift	Deck	Insulation	Insulation Attachment	Membrane	Membrane Attachment	RoofNav #
1-240	Concrete:	Insulation:	Adhered at 12" o.c.:	UltraPly	Self-Adhered	373353-0-0

IF: NC EF: A Slope: ¼"	Min. 2,500 psi Min. 2" thick	ISO 95+ GL, 0.5"-36", 4'x4' boards	I.S.O. Stick/ Twin Jet	TPO SA		
1-555 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	Insulation (2 Layers): ISO 95+ GL(Taper): 1" (.5") min., ISO 95+ GL, 1"-36", 4'x4' boards	Adhered at 12" o.c.: I.S.O. Spray R	.045 mil. min. UltraPly membrane	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	304517-0-0
1-330 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	Insulation: ISO 95+ GL, 1.5"-36", 4'x4' boards	Adhered at 12" o.c.: I.S.O. Twin Pack Adhesive	.060 mil. min. UltraPly membrane	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	223517-0-0
1-360 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	Insulation: ISO 95+ GL, 1.5"-36", 4'x4' boards	Adhered with full application: I.S.O. Spray	.045 mil. min. UltraPly membrane	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	80684-0-0

### Concrete Deck, Adhesively Attached Insulation, Without Cover Board

Uplift	Deck	Insulation	Insulation Attachment	Membrane	Membrane Attachment	RoofNav #
1-360 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	Insulation: ISO 95+ GL, 1.5"-36" 4'x4' boards	Adhered with full application: Hot Asphalt	.060 mil. min. UltraPly membrane	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	245813-0-0
1-480 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	Insulation: ISO 95+ GL, 1.5"-36" 4'x4' boards	Adhered at 8" o.c.: I.S.O. Twin Pack Adhesive	.045 mil. min. UltraPly membrane	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	223518-0-0
1-540 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick Primed: Asphaltic	Insulation: ISO 95+ GL, 1.5"-36" 4'x4' boards	Adhered at 12" o.c.: I.S.O.Stick/ Twin Jet Adhesive	.045 mil. min. UltraPly membrane	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	228481-0-0
1-570 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	Insulation: ISO 95+ GL, 1.5"-36" 4'x4' boards	Adhered at 4" o.c.: I.S.O. Twin Pack Adhesive	.045 mil. min. UltraPly membrane	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	223523-0-0

### Concrete Deck, Adhesively Attached Insulation, With Cover Board

Uplift	Deck	Insulation	Insulation Attachment	Membrane	Membrane Attachment	RoofNav #
1-120 IF: NC EF: A Slope: 2.5"	Concrete: Min. 2,500 psi Min. 2" thick  Primer: Asphaltic	Cover Board: ¼" min. DensDeck (Prime) or Securock Insulation: ISO 95+ GL, 1.5"-36", 4'x4' boards	Adhered at 12" o.c.: I.S.O.Stick/Twin Jet Adhesive	.045 mil. min. UltraPly membrane;	Single-Ply LVOC Bonding UltraPly Bonding Adhesive	228479-0-0

### Concrete Deck, Adhesively Attached Insulation, With Cover Board – Continued

Uplift	Deck	Insulation	Insulation Attachment	Membrane	Membrane Attachment	RoofNav #
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1-270 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	Cover Board: ½" ISOGARD HD Insulation: ISO 95+ GL, 1.5"-36", 4'x4' boards	Adhered at 12" o.c.: I.S.O. Spray R I.S.O. Twin Pack	.045 mil. min. UltraPly membrane	Water Based Bonding Adhesive	233376-0-0
1-255 IF: NC EF: A Slope: 2.5"	Concrete: Min. 2,500 psi Min. 2" thick	Cover Board: ¼" min. DensDeck Prime or Securock Insulation: ISO 95+ GL (RESISTA), ½"-36", 4'x4' boards	Adhered at 12" o.c.: I.S.O. Spray R I.S.O. Twin Pack	.045 mil. min. UltraPly TPO or UltraPly TPO SA	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Self-Adhered	223524-0-0
1-90 IF: NC EF: A Slope: 2.5"	Concrete: Min. 2,500 psi Min. 2" thick V-Force (req.): Self-Adhered Primer: Asphaltic Thermal (opt.): DensDeck, ¼" min.	Cover Board: ¼" min. DensDeck Prime Insulation (Top): Tapered ISO 95+ GL, RESISTA, ½"-4", 4'x4' board Insulation (Bottom): ISO 95+ GL 1.5"-8"	Cover Board and Top Insulation Adhered at 12" o.c.: I.S.O. Spray R I.S.O. Twin Pack I.S.O.Stick/Twin Jet Bottom Insulation: Min. 16 HD fasteners per 4'x8' boards Thermal: Loose Laid	.045 mil. min. UltraPly TPO or UltraPly TPO SA	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Water Based P Self-Adhered	346005-0-0
1-255 IF: NC EF: A Slope: 2.5"	Concrete: Min. 2,500 psi Min. 2" thick	Cover Board: ¼" min. DensDeck Prime Insulation: ISO 95+ GL, RESISTA, ½"-36", 4'x4' boards	Adhered at 12" o.c.: I.S.O. Spray R I.S.O. Twin Pack	.045 mil. min. UltraPly TPO or UltraPly TPO SA;	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Self-Adhered	223524-0-0
1-270 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	Cover Board: ½" ISOGARD HD Insulation: ISO 95+ GL, 1.5"-36", 4'x4' boards	Adhered at 12" o.c.: I.S.O. Spray R I.S.O. Twin Pack	.045 mil. min. UltraPly TPO	Water Based Bonding Adhesive	233376-0-0
1-270 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	Cover Board: ½" ISOGARD HD Insulation: ISO 95+ GL, 1.5"-36", 4'x4' boards	Adhered at 12" o.c.: I.S.O.Stick/Twin Jet	.045 mil. min. UltraPly TPO	Water Based Bonding Adhesive	233380-0-0
1-375 IF: NC EF: A Slope: 2.5"	Concrete: Min. 2,500 psi Min. 2" thick	Cover Board: ¼" DensDeck Prime or Securock Insulation: ISO 95+ GL, 1.5"-36", 4'x4' boards	Adhered at 8" o.c.: I.S.O.Stick/Twin Jet	.045 mil. min. UltraPly TPO or UltraPly TPO SA	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Self-Adhered	223525-0-0
1-390 IF: NC EF: A Slope: 2.5"	Concrete: Min. 2,500 psi Min. 2" thick	Cover Board: ¼" DensDeck Prime or Securock Insulation: ISO 95+ GL, 1.5"-36", 4'x4' boards	Adhered at 12" o.c.: I.S.O. Twin Pack	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	113754-0-0

Concrete Deck, Adhesively Attached Insulation, With Cover Board – Continued

Uplift	Deck	Insulation	Insulation Attachment	Membrane	Membrane Attachment	RoofNav #
1-390	Concrete:	Cover Board:	I.S.O.Spray	.045 mil. min.	Single-Ply LVOC Bonding	135967-0-0

IF: NC EF: A Slope: 2.5"	Min. 2,500 psi Min. 2" thick Primer: Asphaltic	¼" DensDeck Prime or Securock Insulation: ISO 95+ GL, 1.5"-36", 4'x4' boards	full application	UltraPly TPO	Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	
1-390 IF: NC EF: A Slope: 2.5"	Concrete: Min. 2,500 psi Min. 2" thick	Cover Board: ¼" DensDeck Prime or Securock Insulation: ISO 95+ GL, 1.5"-36", 4'x4' boards	Asphalt Attached, full application	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	245811-0-0
1-495 IF: NC EF: A Slope: ½"	Concrete: Min. 2,500 psi Min. 2" thick Primer: Asphaltic	Cover Board: APA Rated OSB, 7/16" min. 4'x4' boards ISO 95+ GL, 1.5"-36" 4'x4' boards	Adhered at 12" o.c.: I.S.O. Stick/Twin Jet	.045 mil. min. UltraPly TPO or UltraPly TPO SA	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Self-Adhered	228464-0-0
1-600 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	Cover Board: ½" ISOGARD HD Insulation: ISO 95+ GL, 1.5"-36", 4'x4' boards	Adhered at 12" o.c.: I.S.O. Stick/Twin Jet	.045 mil. min. UltraPly TPO or UltraPly TPO SA	Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Self-Adhered	233379-0-0

### Steel or Concrete, Mechanically Attached Insulation without Cover Board

Uplift	Deck	Insulation	Insulation Attachment	Membrane	Membrane Attachment	RoofNav #
1-90 IF: 1 EF: A Slope: ¼"	Steel: 22-16-ga. 33 ksi 72" span	Insulation: ISO 95+ GL, 1.5"-12" thick, 4'x8' boards Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Attached with 12 AP or HD fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO	Single-Ply LVOC / Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Water Based P	2113-0-0
1-90 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 PSI Min. 2" thick	Insulation: ISO 95+ GL, 2"-12" thick, 4'x8' boards Optional: V-Force (SA) w/Primer or SBS Torch	Attached with 12 HD fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Water Based P	2106-0-0
1-90 IF: 1 EF: A Slope: ¼"	Steel: 22-16-ga. 33 ksi 72" span	Insulation: ISO 95+ GL, 2"-12" thick, 4'x8' boards Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Attached with 8 AP or HD fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	191607-0-0
1-120 IF: 1 EF: A Slope: ¼"	Steel: 22-18-ga. 33 ksi 72" span	Insulation: ISO 95+ GL, 2"-12" thick 4'x8' boards Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Attached with 18 AP or HD fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	127787-0-0
1-180 IF: 1 EF: A Slope: ¼"	Steel (WR): 20-18-ga. WR 33 ksi 72" span 22-18-ga. 80 ksi 72" span	Insulation: ISO 95+ GL, 1.5"-12" thick, 4'x8' boards Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Attached with 24 AP or HD fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	233194-0-0

### New Construction, Steel or Concrete, Mechanically Attached Insulation without Cover Board – Continued

Uplift	Deck	Insulation	Insulation Attachment	Membrane	Membrane Attachment	RoofNav #
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1-120 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	Insulation: ISO 95+ GL, 2"-12" thick 4'x8' boards Optional: 4-6 mil. Polyethylene or V-Force (SA) or SBS Torch	Attached with 20 Concrete Drive or HD fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO	Water Based Bonding Adhesive	296301-0-0
1-150 IF: 1 EF: A Slope: ¼"	Steel (WR): 22-18-ga. 33 ksi 72" span	Insulation: ISO 95+ GL, 2"-12" thick, 4'x8' boards Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Attached with 20 AP or HD fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	233195-0-0
1-225 IF: 1 EF: A Slope: ¼"	Steel (WR): 18-ga. 33 ksi 72" span 22-18-ga. 80 ksi 72" span	Insulation: ISO 95+ GL, 2"-12" thick 4'x8' boards Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Attached with 32 AP or HD fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	228346-0-0

### Steel, Insulation and/or Mechanically Attached Cover Board

Uplift	Deck	Insulation	Insulation Attachment	Membrane	Membrane Attachment	RoofNav #
1-75 IF: 1 EF: A Slope: ½"	Steel: 22-16-ga. 33 ksi 72" span	Cover Board: ½" min. Structodek HD Fiberboard HD Insulation: ISO 95+ GL, 2"-12" thick, 4'x8' boards Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Cover Board: 12 AP or HD fasteners per 4'x8' boards  Insulation: Loose Laid	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Water Based P	2063-0-0
1-90 IF: 1 EF: A Slope: 2.5"	Steel: 22-16-ga. 33 ksi 72" span	Cover Board: DensDeck, ¼" min. Securock, ½" min. Insulation: ISO 95+ GL, 1.5"-12" Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Cover Board: 16 AP or HD fasteners per 4'x8' board  Insulation: Loose Laid	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Water Based P	112795-0-0
1-90 IF: 1 EF: A Slope: 2.5"	Steel: 22-16-ga. 33 ksi 72" span	Cover Board: DensDeck, ½" min. Securock, ½" min. Insulation: ISO 95+ GL, 1.5"-12" Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Cover Board: 12 AP or HD fasteners per 4'x8' boards  Insulation: Loose Laid	.045 mil. min. UltraPly TPO UltraPly TPO SA	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Water Based P Self-Adhered	209896-0-0



Steel, Insulation and/or Mechanically Attached Cover Board – Continued

Uplift	Deck	Insulation	Insulation Attachment	Membrane	Membrane Attachment	RoofNav #
1-90 IF: NC EF: A Slope: 2.5"	Concrete: Min. 2,500 psi Min. 2" thick	Cover Board: DensDeck, ¼" min. Securock, ¼" min. Insulation: ISO 95+ GL, 1"-12"	Cover Board: 18 AP or HD fasteners per 4'x8' boards  Insulation: Loose Laid	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Water Based P	2064-0-0
1-150 IF: 1 EF: A Slope: 2.5"	Steel: 22-18-ga. 33 ksi 72" span	Cover Board: DensDeck, ½" min. Securock, ½" min. Insulation: ISO 95+ GL, 1.5"-12" Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Cover Board: 24 AP or HD fasteners per 4'x8' boards  Insulation: Loose Laid	.045 mil. min. UltraPly TPO UltraPly TPO SA	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Self-Adhered	200412-0-0
1-210 IF: 1 EF: A Slope: 2.5"	Steel: 22-18-ga. 33 ksi 72" span  22-ga. 33 ksi 64" span  22-18-ga. 80 ksi 72" span	Cover Board: DensDeck, ½" min. Securock, ½" min. Insulation: ISO 95+ GL, 1.5"-12" Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Cover Board: 32 AP or HD fasteners per 4'x8' boards  Insulation: Loose Laid	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	200414-0-0
1-90 IF: 1 EF: A Slope: ½"	Steel: 20-18-ga. 33 ksi 72" span	Cover Board: APA Rated OSB 7/16" min. Insulation: ISO 95+ GL, 1.5"-12" Optional: 4-6 mil. Polyethylene or V- Force (SA) over ¼" DensDeck	Cover Board: 12 HD HAILGARD Fasteners per 4'x8' boards  Insulation: Loose Laid	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Water Based P Self-Adhered	136153-0-0
1-105 IF: 1 EF: A Slope: ½"	Steel (WR): 22-18-ga. 33 ksi 72" span	Cover Board: APA Rated OSB 7/16" min. Insulation: ISO 95+ GL, 1.5"-12" Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Cover Board: 20 HD HAILGARD Fasteners per 4'x8' boards  Insulation: Loose Laid	.045 mil. min. UltraPly TPO UltraPly TPO SA	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Water Based P Self-Adhered	136151-0-0
1-150 IF: 1 EF: A Slope: ½"	Steel (WR): 22-18-ga. 33 ksi 72" span	Cover Board: APA Rated OSB 7/16" min. Insulation: ISO 95+ GL, 1.5"-1.2" Optional: 4-6 mil. Polyethylene or V- Force (SA) over ¼" DensDeck	Cover Board: 16 HD HAILGARD Fasteners per 4'x8' boards  Insulation: Loose Laid	.045 mil. min. UltraPly TPO UltraPly TPO SA	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Self-Adhered	77830-0-0

Steel, Insulation and/or Mechanically Attached Cover Board – Continued

Uplift	Deck	Insulation	Insulation Attachment	Membrane	Membrane Attachment	RoofNav #
1-300 IF: 1 EF: A Slope: 1/2"	Steel (WR): 22-18-ga. 80 ksi 72" span	Cover Board: APA Rated OSB 7/16" min. Insulation: ISO 95+ GL, 1.5"-12" Optional: 4-6 mil. Polyethylene or V-Force (SA) over 1/4" DensDeck	Cover Board: 32 HD HAILGARD Fasteners per 4'x8' boards  Insulation: Loose Laid	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	171664-0-0
1-90 IF: 1 EF: A Slope: 1/2"	Steel (WR): 20-18-ga. 33 ksi 72" span	Insulation: HAILGARD, 2"-4" Optional: 4-6 mil Polyethylene or V-Force (SA) over 1/4" DensDeck	Insulation: 12 HD HAILGARD Fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO UltraPly TPO SA	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Water Based P Self-Adhered	136363-0-0
1-105 IF: 1 EF: A Slope: 1/2"	Steel (WR): 22-18-ga. 33 ksi 72" span	Insulation: HAILGARD, 2"-4" Optional: 4-6 mil. Polyethylene or V-Force (SA) over 1/4" DensDeck	Insulation: 20 HD HAILGARD Fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO UltraPly TPO SA	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Water Based P Self-Adhered	136362-0-0
1-165 IF: 1 EF: A Slope: 1/2"	Steel (WR): 22-18-ga. 33 ksi 72" span	Insulation: HAILGARD, 1.5" - 4" Optional: 4-6 mil. Polyethylene or V- Force (SA) over 1/4" DensDeck	Insulation: 32 HD HAILGARD Fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	328832-0-0
1-300 IF: 1 EF: A Slope: 1/2"	Steel (WR): 18-ga. 33 ksi 70" span  20-ga. 33 ksi 60" span  22-18-ga. 80 ksi 72" span	Insulation: HAILGARD, 1.5"-4" Optional: 4-6 mil. Polyethylene or V-Force (SA) over 1/4" DensDeck	Insulation: 32 HD HAILGARD Fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	171662-0-0
1-90 IF: 1 EF: A Slope: 1/4"	Steel: 22-16-ga. 33 ksi 72" span	Cover Board: ISOGARD HD, 1/2" min. Insulation: ISO 95+ GL, 1.5"-12" Optional: 4-6 mil. Polyethylene or V-Force (SA) over 1/4" DensDeck	Cover Board: 12 HD or AP Fasteners per 4'x8' boards  Insulation: Loose Laid	.045 mil. min. UltraPly TPO UltraPly TPO SA	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Self-Adhered	233370-0-0

## Steel or Concrete, Base Insulation Attached and Insulation/Cover Board Adhered

Uplift	Deck	Insulation	Insulation Attachment	Membrane	Membrane Attachment	RoofNav #
1-90 IF: 1 EF: A Slope: ¼"	Steel: 22-16-ga. 33 ksi 72" span	Cover Board: ISO GARD HD, ½" min. Insulation: ISO 95+ GL, 1.5"-12" Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Cover Board: Adhered at 12" o.c.: I.S.O. Spray R I.S.O. Twin Pack Insulation: 16 HD or AP Fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO UltraPly TPO SA	Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive Self-Adhered	233373-0-0
1-90 IF: 1 EF: A Slope: ¼"	Steel: 22-18-ga. 33 ksi 72" span	Cover Board: DensDeck Prime, ¼" min Insulation: ISO 95+ GL, 2"-12"	Cover Board: Adhered at 12" o.c.: I.S.O. Twin Pack Insulation: 8 HD or AP Fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 Water Based P	388285-0-0
1-90 IF: 1 EF: A Slope: 2.5"	Steel: 22-16-ga. 33 ksi 72" span	Cover Board: DensDeck, DensDeck Prime, Securock ¼" min. Insulation: ISO 95+ GL, 1.5"-12"	Cover Board: Adhered at 12" o.c.: I.S.O. Spray R I.S.O. Twin Pack Insulation: 16 HD or AP Fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168	233196-0-0
1-90 IF: 1 EF: A Slope: ¼"	Steel: 22-16-ga. 33 ksi 72" span	Insulation (Top): ISO 95+ GL/ ISO GARD GL, 1.5"-4" Insulation (Bottom): ISO 95+ GL, 1.5"-4"	Insulation (Top): Adhered at 12" o.c.: I.S.O. Twin Pack Insulation (Bottom): 16 HD or AP Fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO	Single-Ply LVOC Bonding Single-Ply LVOC Bonding 1168 UltraPly Bonding Adhesive	230423-0-0

## Adhered Uplift Ratings – UltraPly TPO SA Membrane

### Steel Deck, Mechanically Attached Insulation, Without Cover Board

Uplift	Deck	Insulation	Insulation Attachment	Membrane	RoofNav #
1-90 IF: 1 EF: A Slope: ¼"	Steel: 22-16-ga. 33 ksi 72" span	Insulation: ISO 95+ GL, 2"-12" Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Insulation: 8 HD or AP Fasteners Per 4'x8' boards	.045 mil. min. UltraPly TPO SA	373219-0-0
1-120 IF: 1 EF: A Slope: ¼"	Steel (WR): 22-18-ga. 33 ksi 72" span	Insulation: ISO 95+ GL, 1.5" - 12" Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Insulation: 18 HD or AP Fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO SA	373217-0-0
1-165 IF: 1 EF: A Slope: ¼"	Steel (WR): 22-18-ga. 33 ksi 72" span	Insulation: ISO 95+ GL, 1.5"-12" Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Insulation: 24 HD or AP Fasteners Per 4'x8' boards	.045 mil. min. UltraPly TPO SA	373246-0-0

## Concrete Deck, Mechanically Attached Insulation, Without Cover Board

Uplift	Deck	Insulation	Insulation Attachment	Membrane	RoofNav #
1-90 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	Insulation: ISO 95+ GL, 1.25"-12"  Optional: V-Force (SA) and Primer or SBS Torch	Insulation: 12 Concrete Drive or HP Fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO SA	373390-0-0
1-150 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	Insulation: ISO 95+ GL, 2"-4"  Optional: ISO 95+ GL, ½"-12"  Optional: or V-Force (SA) and Primer or SBS Torch	Insulation: 20 Concrete Drive or HP Fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO SA	373397-0-0
1-300 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	Insulation (Top): ISO 95+ GL, 2"-4"  Optional (Bottom): ISO 95+ GL, ½"-12"  Optional: V-Force (SA) and Primer or SBS Torch	Insulation: 32 Concrete Drive or HP Fasteners per 4'x8' boards	.045 mil. min. UltraPly TPO SA	373398-0-0

## Steel Deck, Mechanically Attached Insulation, Adhesively Attached Insulation

Uplift	Deck	Insulation	Insulation Attachment	Membrane	RoofNav #
1-60 IF: 1 EF: A Slope: ¼"	Steel: 22-18-ga. 33 ksi 72" span	Insulation (Top): ISO 95+ GL, 1.5"-8"  Insulation (Bottom): ISO 95+ GL, 1.5"-4"  Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	(Top) Adhered at 12" o.c.: I.S.O. Spray R Twin Pack I.S.O.Stick/Twin Jet  (Bottom): 12 AP or HD fasteners and plates per 4'x8' boards  Optional Vapor/Thermal: Loose Laid	.045 mil. min. UltraPly TPO SA	373224-0-0
1-75 IF: 1 EF: A Slope: ¼"	Steel: 22-16-ga. 33 ksi 72" span	Insulation (Top): ISO 95+ GL, 1.5"-8"  Insulation (Bottom): ISO 95+ GL, 2"-4"  Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	(Top) Adhered at 12" o.c.: I.S.O. Spray R Twin Pack I.S.O.Stick/Twin Jet  (Bottom): 8 AP or HD fasteners and plates per 4'x8' boards  Optional Vapor/Thermal: Loose Laid	.045 mil. min. UltraPly TPO SA	373230-0-0

## Steel Deck, Mechanically Attached Insulation, Adhesively Attached Insulation

Uplift	Deck	Insulation	Insulation Attachment	Membrane	RoofNav #
1-90 IF: 1 EF: A Slope: ¼"	Steel: 22-16-ga. 33 ksi 72" span	Insulation (Top): ISO 95+ GL, 1.5"-4"  Insulation (Bottom): ISO 95+ GL, 2.25"-4"  Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	(Top) Adhered at 12" o.c.: Twin Pack I.S.O.Stick/Twin Jet  (Bottom): 8 AP or HD fasteners and plates per 4'x8' boards  Optional Vapor/Thermal: Loose Laid	.045 mil. min. UltraPly TPO SA	373236-0-0
1-150 IF: 1 EF: A Slope: ¼"	Steel: 22-18-ga. 33 ksi 72" span	Insulation (Top): ISO 95+ GL, ¼"  Insulation (Bottom): ISO 95+ GL, 1.5"-4"  Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	(Top) Adhered at 12" o.c.: Twin Pack (Bottom): 20 AP or HD fasteners and plates per 4'x8' boards  Optional Vapor/Thermal: Loose Laid	.045 mil. min. UltraPly TPO SA	373245-0-0

## Concrete Deck, Mechanically Attached Insulation, Adhesively Attached Insulation

Uplift	Deck	Insulation	Insulation Attachment	Membrane	RoofNav #
1-90 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	Insulation: ISO 95+ GL, 1.5"-4" thick  Insulation (Bottom): ISO 95+ GL, 2.25"-8" Thick  Optional: V-Force or SBS Torch	(Top): Adhered at 12" o.c.: I.S.O. Twin Pack I.S.O.Stick/Twin Jet  (Bottom): 8 HD fasteners and plates per 4'x8' boards  Optional: Self-Adhered or Torched	.045 mil. min. UltraPly TPO SA	373371-0-0
1-255 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	Insulation: ISO 95+ GL, 1"-4" Thick  Insulation (Bottom): ISO 95+ GL, 2"-8" Thick  Optional: V-Force or SBS Torch	(Top): Adhered at 4" o.c.: I.S.O. Spray R I.S.O. Twin Pack I.S.O.Stick/Twin Jet  (Bottom): 32 HD or Concrete Drive fasteners and plates 4'x8' boards  Optional: Self-Adhered or Torched	.045 mil. min. UltraPly TPO SA	373389-0-0

## Steel Deck, Insulation with Mechanically Attached Cover Board

Uplift	Deck	Insulation	Insulation Attachment	Membrane	RoofNav #
1-90 IF: 1 EF: A Slope: 2.5	Steel: 22-16-ga. 33 ksi 72" span	Cover Board: DensDeck, ¼" min. or Securock, ½" min. Insulation: ISO 95+ GL, 1.5"-12" Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Cover Board: 12 HD or AP fasteners per 4'x8' boards  Insulation: Loose Laid  Optional: Loose Laid V-Force – Shelf-Adhered	.045 mil. min. UltraPly TPO SA or UltraPly TPO (SP LVOC, SP LVOC 1168, UltraPly, WB P)	271664-0-0
1-90 IF: 1 EF: A Slope: 2.5	Steel: 22-16-ga. 33 ksi 72" span	Cover Board: ISOGARD HD, ½" min. Insulation: ISO 95+ GL, 1.5"-12" Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Cover Board: 12 HD or AP fasteners per 4'x8' boards  Insulation: Loose Laid  Optional: Loose Laid V-Force – Shelf-Adhered	.045 mil. min. UltraPly TPO SA or UltraPly TPO (SP LVOC, SP LVOC 1168, UltraPly)	233370-0-0

## Concrete Deck, Insulation with Mechanically Attached Cover Board

Uplift	Deck	Insulation	Insulation Attachment	Membrane	RoofNav #
1-90 IF: NC EF: A Slope: ¼"	Concrete: Min. 2,500 psi Min. 2" thick	Cover Board: ISOGARD HD, 1" min.  Insulation: ISO 95+ GL, 1.5"-4"	Cover Board: 18 Concrete Drive or HD fasteners per 4'x8' boards  Insulation: Loose Laid	.045 mil. min. UltraPly TPO SA or UltraPly TPO (SP LVOC, SP LVOC 1168, UltraPly, WB P)	290613-0-0
1-90 IF: NC EF: A Slope: ¼"	Concrete Optional: V-Force or Polyethylene	Cover Board: Securock, ½" min.  Insulation: ISO 95+ GL, 1.5"-12"  Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Cover Board: 8 Concrete Drive or HD fasteners per 4'x8' boards  Insulation: Loose Laid  Optional: Loose Laid V-Force – Shelf-Adhered	045 mil. min. UltraPly TPO SA or UltraPly TPO (SP LVOC, SP LVOC 1168, UltraPly, WB P)	372640-0-0

## Elevate Adhered Uplift Ratings – UltraPly XR 100 and XR 115 membrane

### Steel or Concrete Deck, Insulation without Cover Board, UltraPly XR Membrane

Uplift	Deck	Insulation	Insulation Attachment	Membrane and Attachment	RoofNav #
1-90 IF: 1 EF: A Slope: ½"	Steel: 22-1-ga. 33 ksi 72" span	Insulation: ISO 95+ GL, 1.5"-4"  Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Insulation: 16 HD or AP fasteners per 4'x8' boards  Optional: Poly - Loose Laid V-Force – Shelf-Adhered DD – Loose Laid	UltraPly XR: 100, 115 or 135  12" o.c. ribbons: I.S.O. Spray R XR Stick	289254-0-0
1-90 IF: NC EF: A Slope: ½"	Concrete: Min. 2,500 psi Min. 2" thick	Insulation: ISO 95+ GL, 1.5"-12"  Optional: V-Force (SA) or SBS Torch	Insulation: 16 Concrete Drive or HD fasteners per 4'x8' boards  Optional: V-Force – Shelf-Adhered SBS Torch - Torched	UltraPly XR 100, 115 or 135 12" o.c. ribbons: I.S.O. Spray R XR Stick	289250-0-0
1-165 IF: 1 EF: A Slope: ½"	Steel: 22-18-ga. 33 ksi 72" span	Insulation: ISO 95+ GL, 2"-12"  Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Insulation: 20 HD or AP fasteners per 4'x8' boards  Optional: Poly - Loose Laid V-Force – Shelf-Adhered DD – Loose Laid	UltraPly XR 100, 115 or 135  6" o.c. ribbons: I.S.O. Spray R XR Stick	292119-0-0
1-165 IF: NC EF: A Slope: ½"	Concrete: Min. 2,500 psi Min. 2" thick	Insulation: ISO 95+ GL, 2"-12"  Optional: V-Force (SA) or SBS Torch	Insulation: 20 Concrete Drive or HD fasteners per 4'x8' boards  Optional: V-Force – Shelf-Adhered SBS Torch - Torched	UltraPly XR 100, 115 or 135  6" o.c. ribbons: I.S.O. Spray R XR Stick	289292-0-0
1-285 IF: NC EF: A Slope: ½"	Concrete: Min. 2,500 psi Min. 2" thick	Insulation: ISO 95+ GL, 2"-12"  Optional: V-Force (SA) or SBS Torch	Insulation: 32 Concrete Drive or HD fasteners per 4'x8' boards  Optional: V-Force – Shelf-Adhered SBS Torch - Torched	UltraPly XR 100, 115 or 135  4" o.c. ribbons: I.S.O. Spray R XR Stick	289295-0-0
1-285 IF: 1 EF: A Slope: ½"	Steel: 18-ga., 33 ksi 72" span	Insulation: ISO 95+ GL, 2"-12"  Optional: 4-6 mil. Polyethylene or V-Force (SA) over ¼" DensDeck	Insulation: 32 HD or AP fasteners per 4'x8' boards  Optional: Poly - Loose Laid V-Force – Shelf-Adhered DD – Loose Laid	UltraPly XR 100, 115 or 135  4" o.c. ribbons: I.S.O. Spray R XR Stick	292137-0-0
	22-18-ga. 80 ksi 72" span				

## Steel or Concrete Deck, Insulation with Cover Board, UltraPly XR Membrane

Uplift	Deck	Insulation	Insulation Attachment	Membrane and Attachment	RoofNav #
1-90 IF: NC EF: A Slope: 1/2"	Concrete: Min. 2,500 psi Min. 2" thick	Cover Board: APA Rated OSB, 7/16" Insulation: ISO 95+ GL, 1.5"-12" Optional: V-Force (SA) or SBS Torch	Cover Board: 16 Concrete Drive or HD fasteners per 4'x8' boards Insulation: Loose Laid Optional: V-Force – Shelf-Adhered or SBS Torch - Torched	UltraPly XR 100, 115 or 135  12" o.c. ribbons: I.S.O. Spray R XR Stick	289274-0-0
1-120 IF: NC EF: A Slope: 2"	Concrete: Min. 2,500 psi Min. 2" thick	Cover Board: DensDeck, 1/2" min. or Securock, 1/2" min. Insulation: ISO 95+ GL, 1.5"-12" Optional: V-Force (SA) or SBS Torch	Cover Board: 4'x4' boards attached w/ 6" o.c. beads: I.S.O. Spray R I.S.O. Twin Pack I.S.O. Stick/Twin Jet Insulation: 20 Concrete Drive or HD fasteners per 4'x8' board Optional: V-Force – Shelf-Adhered or SBS Torch - Torched	UltraPly XR 100, 115 or 135  6" o.c. ribbons: I.S.O. Spray R XR Stick	289300-0-0
1-120 IF: 1 EF: A Slope: 2"	Steel (WR): 22-18-ga. 33 ksi 72" span	Cover Board: DensDeck, 1/2" min. or Securock, 1/2" min. Insulation: ISO 95+ GL, 1.5"-12" Optional: 4-6 mil. Polyethylene or V-Force (SA) over 1/4" DensDeck	Cover Board: 4'x4' boards attached w/6" o.c. beads I.S.O. Spray R I.S.O. Twin Pack I.S.O. Stick/Twin Jet Insulation: 20 HD or AP fasteners per 4'x8' board Optional: Poly - Loose Laid V-Force – Shelf-Adhered and DD – Loose Laid	UltraPly XR 100, 115 or 135  6" o.c. ribbons: I.S.O. Spray R XR Stick	292145-0-0
1-165 IF: 1 EF: A Slope: 1/2"	Steel (WR): 22-18-ga. 33 ksi 72" span	Cover Board: ISOGARD HD, 1/2" min. Insulation: ISO 95+ GL, 2"-12" Optional: 4-6 mil. Polyethylene or V-Force (SA) over 1/4" DensDeck	Cover Board: 4'x4' boards attached w/6" o.c. beads I.S.O. Spray R I.S.O. Twin Pack I.S.O. Stick/Twin Jet Insulation: 20 HD or AP fasteners per 4'x8' boards Optional: Poly - Loose Laid V-Force – Shelf-Adhered and DD – Loose Laid	UltraPly XR 100, 115 or 135  6" o.c. ribbons: I.S.O. Spray R XR Stick	320536-0-0
1-165 IF: NC EF: A Slope: 1/2"	Concrete: Min. 2,500 psi Min. 2" thick	Cover Board: ISOGARD HD, 1/2" min. Insulation: ISO 95+ GL, 2"-12" Optional: V-Force (SA) Or SBS Torch	Cover Board: 4'x4' boards attached w/6" o.c. beads I.S.O. Spray R I.S.O. Twin Pack I.S.O. Stick/Twin Jet Insulation: 20 Concrete Drive or HD fasteners per 4'x8' board Optional: V-Force – Shelf-Adhered or SBS Torch - Torched	UltraPly XR 100, 115 or 135  6" o.c. ribbons: I.S.O. Spray R XR Stick	320464-0-0
1-255 IF: NC EF: A Slope: 2"	Concrete: Min. 2,500 psi Min. 2" thick	Cover Board: DensDeck, 1/2" min. or Securock, 1/2" min. Insulation: ISO 95+ GL, 2"-12" Optional: V-Force (SA) or SBS Torch	Cover Board: 4'x4' boards attached w/6" o.c. beads I.S.O. Spray R I.S.O. Twin Pack I.S.O. Stick/Twin Jet Insulation: 32 Concrete Drive or HD fasteners per 4'x8' board Optional: V-Force – Shelf-Adhered or SBS Torch - Torched	UltraPly XR 100, 115 or 135  4" o.c. ribbons: I.S.O. Spray R XR Stick	289296-0-0

## Concrete Deck, Adhered Insulation Only, UltraPly XR Membrane

Uplift	Deck	Insulation	Insulation Attachment	Membrane and Attachment	RoofNav #
1-465 IF: NC EF: A Slope: 4"	Concrete: Min. 2,500 psi Min. 2" thick	Insulation: DensDeck, 1/4" min. Or Securock, 1/4" min.	Insulation: Full Coverage, Hot Asphalt, 4'x4' boards	UltraPly XR 100, 115 or 135 Full Coverage: XR Bonding Adhesive	243447-0-0

## Concrete Deck, UltraPly XR Membrane

Uplift	Deck	Membrane	Membrane Attachment	RoofNav #
1-720 IF:NC EF: A Slope: 4"	Concrete: Min. 2,500 psi Min. 2" thick	UltraPly TPO XR 115 or 135	Full Coverage: XR Bonding Adhesive	242966-0-0
1-945 IF:NC EF: A Slope: 2"	Concrete: Min. 2,500 psi Min. 2" thick	UltraPly TPO XR 100, 115, or 135	Full Coverage: I.S.O. Spray	293219-0-0
1-975 IF:NC EF: A Slope: 1"	Concrete: Min. 2,500 psi Min. 2" thick	UltraPly TPO XR 115 or 135	Full Coverage: Hot Asphalt	243438-0-0

## Concrete, Vapor Barrier, Adhesively Attached Insulation, UltraPly XR Membrane

Uplift	Deck	Cover Board/Insulation	Cover Board/Insulation Attachment	Membrane and Attachment	RoofNav #
1-345  IF:NC EF: A Slope: 1/2"	Concrete: Min. 2,500 psi Min. 2" thick  Vapor Barrier (Required): MB Base, SBS Poly Base, SBS Premium Base SBS Smooth or Type IV or VI	Insulation: ISOGARD HD, 1/2" thick, 4'x4' boards	Insulation: 4'x4' boards 12" o.c. beads I.S.O. Spray I.S.O. Twin Pack I.S.O.Stick/Twin Jet	UltraPly TPO XR 100, 115, 135 Full Coverage: I.S.O. Spray XR Stick	292419-0-0
1-345  IF:NC EF: A Slope: 1/2"	Concrete: Min. 2,500 psi Min. 2" thick	Insulation: DensDeck, 1/4" min. or Securock, 1/4" min.	Insulation: 4'x4' boards, 12" o.c. beads I.S.O. Spray I.S.O. Twin Pack I.S.O.Stick/Twin Jet	UltraPly TPO XR 100, 115, 135 Full Coverage: I.S.O. Spray XR Stick	292418-0-0
1-90  IF:NC EF: A Slope: 2"	Concrete: Min. 2,500 psi Min. 2" thick  Vapor Barrier (Required): V-Force w/ Primer	Cover Board: 1/4" min. DensDeck Prime  Insulation: 1/2" - 36" ISO 95+ GL (F/T) or Resista (F/T)	Cover Board: 4'x4' boards 12" o.c. beads I.S.O. Spray R I.S.O. Twin Pack I.S.O.Stick I.S.O. Twin Jet  Insulation: 4'x4' boards 12" o.c. beads I.S.O. Spray R I.S.O. Twin Pack I.S.O.Stick I.S.O. Twin Jet	UltraPly TPO XR Min. 100 mil.  Full Coverage: Twin Jet (4" o.c. or Spatter)  12" o.c. Beads: ISO Spray R XR Stick	345864-0-0
1-120  IF:NC EF: A Slope: 2"	Concrete: Min. 2,500 psi Min. 2" thick  Vapor Barrier (Required): V-Force w/ Primer	Cover Board: 1/2" min. DensDeck Prime  Insulation: 1/2" - 36" ISO 95+ GL (F/T)	Cover Board: 4'x4' boards 12" o.c. beads I.S.O. Spray R I.S.O. Twin Pack I.S.O.Stick I.S.O. Twin Jet  Insulation: 4'x4' boards 12" o.c. beads I.S.O. Spray R I.S.O. Twin Pack I.S.O.Stick I.S.O. Twin Jet	UltraPly TPO XR Min. 100 mil.  Full Coverage: Twin Jet (4" o.c. or Spatter)  6" o.c. Beads: ISO Spray R XR Stick	345870-0-0

## Lightweight Insulated Concrete, UltraPly XR Membrane

Uplift	Deck	Lightweight Manufacturer	Membrane	Membrane Attachment	RoofNav #
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1-420 IF:NC EF: A Slope: 1/2"	Concrete: Min. 2,500 psi Min. 2" thick	Range II Elastizell Lightweight Insulating Concrete 2" min. thick.	UltraPly TPO XR 100 or 115 membrane	Full Coverage: XR Bonding Adhesive	244665-0- 244657
1-180 IF:NC EF: A Slope: 1/2"	Concrete: Min. 2,500 PSI Min. 2" thick	Celcore MF Cellular Concrete with Celcore HS Rheology Modifying Admixture (min 340 psi) 2" min. thick.	UltraPly TPO XR 100 or 115 membrane	Full Coverage: XR Bonding Adhesive	244648-0- 244646

### Re-Cover Construction, Lightweight Insulating Concrete over Steel, Nailed Base Sheet with Adhesively Attached Insulation and Cover Board

Uplift	Deck	Cover Board/Insulation	Insulation Attachment	Membrane	Membrane Attachment	RoofNav #
1-90 IF:1 EF: A Slope: 2.5"	LWIC over Steel (Re-Cover)  Base Sheet: Channel Venting Base MB Base SBS Base (Various)	Cover Board (4'x4' boards): DensDeck, 1/4" min. or Securock, 1/4" min.  Insulation (4'x4' boards): ISO 95+ GL, 1"-8 Tapered I.S.O., 1"-8" (RESISTA)	Insulation: 4'x4' boards, 12" o.c. beads I.S.O. Twin Pack I.S.O. Stick/Twin Jet  Base Sheet: Two Piece Impact Nail, Seams – 35.4" Rows, 7" o.c. 2 Field Rows – 11.75" o.c. staggered	.045 mil. min. UltraPly TPO UltraPly TPO SA	Single-Ply LVOC Single-Ply LVOC 1168 UltraPly Bonding WBBA P Self-Adhered	327092-0-0

### Lightweight Insulating Concrete over Structural Concrete, with Adhered Insulation and Cover Board

Uplift	Deck	Cover Board/Insulation	Insulation Attachment	Membrane	Membrane Attachment	RoofNav #
1-375 IF:NC EF: A Slope: 2.5"	Celcore LWIC over Structural Concrete Min. 2,500 psi Min. 2" thick	Cover Board (4'x4' boards): DensDeck, 1/4" min. or Securock, 1/4" min. Insulation (4'x4' boards): ISO 95+ GL, 1"-12" thick Tapered I.S.O., 1"-8" thick (RESISTA)	Insulation: 4'x4' boards, 12" o.c. beads I.S.O. Stick	.045 mil. min. UltraPly TPO UltraPly TPO SA	Single-Ply LVOC Single-Ply LVOC 1168 UltraPly Bonding Self-Adhered	339642-0- 339279

### Re-Cover Construction, Gypsum Deck, Adhered Insulation, Without Cover Board

Uplift	Deck	Insulation	Insulation Attachment	Membrane	Membrane Attachment	RoofNav #
1-90 IF:1 EF: A Slope: 1/4"	Gypsum (Re-Cover)	Insulation (4'x4' boards): ISO 95+ GL, 1"-12" thick Tapered I.S.O., 1"-12" thick 1/2" ISOGARD HD	Insulation: 4'x4' boards, 12" o.c. beads I.S.O. Twin Pack	.045 mil. min. UltraPly TPO; UltraPly TPO SA	Single-Ply LVOC UltraPly Bonding Self-Adhered	319860-0-0

## Re-Roof Construction, Gypsum Deck, Adhesively Attached Insulation, With Cover Board

Uplift	Deck	Cover Board/Insulation	Insulation Attachment	Membrane	Membrane Attachment	RoofNav #
1-90  IF: 1 EF: A Slope: 2.5"	Gypsum (Re-Roof)	(All layers 4'x4' boards) Cover Board: DensDeck, 1/4" min., Securock, 1/4" min.  Second Layer Insulation: ISO 95+ GL, 1.5"-8" thick, Tapered I.S.O., 1.5"-8" thick  Base Layer Insulation: ISO 95+ GL, 1.5"-4" thick, Tapered I.S.O., 1.5"-4" thick	12" o.c. beads: Twin Pack Adhesive	UltraPly TPO membrane	Water Basted UltraPly Single-Ply LVOC Single-Ply LVOC (1168)	113387-0-0
1-90 IF: 1 EF: A Slope: 1/4"	Gypsum (Re-Roof)	(All layers 4'x4' boards) Insulation: ISO 95+ GL, 1.5"-12" thick or Tapered I.S.O. 1.5"-12" thick	12" o.c. beads Twin Pack Adhesive	UltraPly TPO membrane	Water Basted UltraPly Single-Ply LVOC Single-Ply LVOC (1168)	113389-0-0
1-90  IF: 1 EF: A Slope: 2.5"	Gypsum	(All layers 4'x4' boards) Cover Board: DensDeck, 1/4" min., Securock, 1/4" min.  Insulation: ISO 95+ GL, 1.5"-8" thick, Tapered I.S.O., 1.5"-8" thick	12" o.c. beads: I.S.O. Stick	UltraPly TPO membrane	Water Basted UltraPly Single-Ply LVOC Single-Ply LVOC (1168)	115286-0-0

## Re-Roof Construction, Gypsum Deck, Adhesively Attached Insulation, With Cover Board

Uplift	Deck	Insulation	Insulation Attachment	Cover Board	Cover Board Attachment	Membrane	Membrane Attachment	RoofNav #
1-90  IF: 1 EF: A Slope: 2.5"	Gypsum (Re-Roof)	None	None	1/4" min., 4'x4' boards: DensDeck, Securock	12" o.c. beads: Twin Pack	UltraPly TPO membrane	UltraPly2, Water Based Bonding Adhesive P, Single-Ply LVOC, Single-Ply LVOC (1168)	113400-0-0
1-90 IF: 1 EF: A Slope: 2.5"	Gypsum (Re-Roof)	ISO 95+ GL .5"-12", 4'x4' boards	12" o.c. beads of I.S.O. Stick/ Twin Jet Adhesive	1/4" minimum, 4'x4' boards: DensDeck Prime	12" o.c. beads: I.S.O. Stick/ Twin Jet	UltraPly TPO membrane	UltraPly, Water Based Bonding Adhesive P, Single-Ply LVOC, Single-Ply LVOC (1168)	115286-0-0

## Re-cover over Treated Wood Deck Adhered Membrane

Uplift	Deck	Insulation	Insulation Attachment	Membrane	Membrane Attachment	RoofNav #
1-75 IF: 1 EF: A Slope: 1/4"	Treated Wood	ISO 95+ GL 1/2"-1" thick	12 AP fasteners Plates per 4'x8' boards	UltraPly TPO membrane, Single weld	UltraPly or Single-Ply LVOC Bonding Adhesive	129268-0-0
1-75 IF: 1 EF: A Slope: 1/4"	Treated Wood	ISO 95+ GL 1/2"-1" thick	12 AP fasteners Plates per 4'x8' boards	UltraPly TPO SA membrane, Single weld	None	374222-0-0
1-90 IF: 1 EF: A Slope: 1/4"	Treated Wood	ISO 95+ GL min. 1" thick	16 AP fasteners Plates per 4'x8' boards	UltraPly TPO membrane, Single weld	UltraPly or Single-Ply LVOC Bonding Adhesive	326804-0-0
1-90 IF: 1 EF: A Slope: 1/4"	Treated Wood	ISO 95+ GL 1/2"-1" thick	16 AP fasteners Plates per 4'x8' boards	UltraPly TPO SA membrane, Single weld	None	374236-0-0

## Mechanically Attached Systems Uplift Ratings – Standard UltraPly Membrane

### Steel, Mechanically Attached Insulation, Single Weld

Uplift	Deck	Insulation and Attachment	Membrane	Membrane Attachment	RoofNav #
1-60 IF: 1 EF: A Slope: ¾"	Steel 22-18-ga. 80 ksi 72" span	Insulation: ISO 95+ GL, 1.5"-12" Pre-securement – min. 5/board Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over ¼" DensDeck	UltraPly TPO membrane, 10' sheet	12" o.c. HD fastener and HD or Barbed Seam Plate, Single weld	3080-0-0
1-60 IF: 1 EF: A Slope: ¾"	18-ga. 33 ksi 72" span	Insulation: 1.5"-12" thick ISO 95+ GL Tapered I.S.O.  Optional: 4/6 mil. Polyethylene or V-Force or BASEGARD SA over ¼" DensDeck (possible primer)	45-80 mil. UltraPly TPO	Sheet Size: 12' sheet Row Spacing: 142"  Fastener spacing: 6" o.c. HD Fasteners and HD Seam Plates or HD Fasteners and Batten Strip (M)	335428-0-0
	20-ga. 33 ksi 60" span				
	22-ga. 33 ksi 48" span				
	20-ga. 80 ksi 72" span				
	22-ga. 80 ksi 72" span				
1-60 IF: 1 EF: A Slope: ¾"	Steel: 20-16-ga., 33 ksi 72" span	Insulation: ISO 95+ GL, 1.5"-12" Pre-securement – min. 5/board Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over ¼" DensDeck  Optional: V-Force or BASEGARD SA and DensDeck or Polyethylene	UltraPly TPO membrane, 10' sheet	12" o.c. HD fastener and HD Seam Plate, Single weld	170476-0-0
	22-ga., 33 ksi 60" span				
	22-ga., 80 ksi 72" span				
1-75 IF: 1 EF: A Slope: 1"	22-18-ga. 33 ksi 72" span	Insulation: 1.5" -12" thick ISO 95+ GL Tapered I.S.O. RESISTA or 1.5"-4" ISOGARD HD Composite Insulation (Optional): 1.5"-9.5" ISO 95+ GL Tapered I.S.O. RESISTA  Optional: 4/6 mil. Polyethylene	45-80 mil. UltraPly TPO	Sheet Size: 8' sheet Row Spacing: 90" Fastener spacing: 12" o.c.  HD Fasteners and HD Seam Plates	339042-0-0
1-75 IF: 1 EF: A Slope: 1"	22-18-ga. 80 ksi 72" span	Insulation: 1.5" -12" thick ISO 95+ GL Tapered I.S.O. RESISTA  Optional: 4/6 mil. Polyethylene or V-Force or BASEGARD SA over ¼" DensDeck (possible primer)	60-80 mil. UltraPly TPO	Sheet Size: 10' sheet Row Spacing: 114" Fastener spacing: 12" o.c.  HD Fasteners and HD Seam Plates	375098-0-0
1-90 IF: 1 EF: A Slope: ¾"	Steel: 22-18-ga., 80 ksi 72" span Optional: V-Force or BASEGARD SA and DensDeck or Polyethylene	ISO 95+ GL, 1.5"-12", Preliminary Securement or ISO 95+ GL (Tapered) 1.5"-4"	UltraPly TPO membrane, 10' sheet	12" o.c. HD+ fastener and HD+ Seam Plate, Single weld	76911-0-0

Steel, Mechanically Attached Insulation, Single Weld – Continued

Uplift	Deck	Insulation and Attachment	Membrane	Membrane Attachment	RoofNav #
1-90 IF: 1 EF: A Slope: 3/4"	Steel: 18-16-ga., 33 ksi 72" span	Insulation: ISO 95+ GL, 1.5"-12" Pre-securement – min. 5/board Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over 1/4" DensDeck	UltraPly TPO membrane, 10' sheet	6" o.c. HD fastener and HD or Barbed Seam Plate, Single weld	166431-0-0
	20-ga., 33 ksi 48" span				
	20-ga., 80 ksi 72" span				
	22-ga., 80 ksi 72" span				
1-90 IF: 1 EF: A Slope: 3/4"	Steel: 20-16-ga., 33 ksi 72" span	Insulation: ISO 95+ GL, 1.5"-12" Pre-securement – min. 5/board Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over 1/4" DensDeck	UltraPly TPO membrane, 8' sheet	12" o.c. HD+ fastener and HD+ Seam Plate, Single weld	213747-0-0
	22-ga., 33 ksi 48" span				
	22-ga., 80 ksi 72" span				
1-90 IF: 1 EF: A Slope: 3/4"	22-18-ga. 80 ksi 72" span	Insulation: 1.5" -12" thick ISO 95+ GL Tapered I.S.O.  Optional: 4/6 mil. Polyethylene or V-Force or BASEGARD SA over 1/4" DensDeck (possible primer)	45-80 mil. UltraPly TPO	Sheet Size: 8' sheet Row Spacing: 90" Fastener spacing: 12" o.c. HD Fasteners and HD Seam Plates	76897-0-0
1-90 IF: 1 EF: A Slope: 1"	22-18-ga. 80 ksi 72" span	Insulation: 1.5"-12" thick ISO 95+ GL Tapered I.S.O. RESISTA Optional: 4/6 mil. Polyethylene	45-80 mil. UltraPly TPO	Sheet Size: 12' sheet Row Spacing: 71" Fastener spacing: 12" o.c. *Intermediate Batten Rows HD Fasteners and Batten Strip (M/P)	343386-0-0
1-90 IF: 1 EF: A Slope: 3/4"	22-18-ga. 80 ksi 72" span	Insulation: 1.5"-12" thick ISO 95+ GL Tapered I.S.O.  Optional: 4/6 mil. Polyethylene or V-Force or BASEGARD SA over 1/4" DensDeck (possible primer)	45-80 mil. UltraPly TPO	Sheet Size: 8' sheet Row Spacing: 90" Fastener spacing: 12" o.c. HD Fasteners and HD Seam Plates *WIDE WELD*	76731-0-0
1-90 IF: 1 EF: A Slope: 1"	22-16-ga. 33 ksi 72" span	Insulation: 1.5"-12" thick ISO 95+ GL Tapered I.S.O. RESISTA Optional: 4/6 mil. Polyethylene or V-Force SA over 1/4" DensDeck (possible primer)	45-80 mil. UltraPly TPO	Sheet Size: 10' sheet Row Spacing: 72" Fastener spacing: 12" o.c. RMA Strip w/ HD Fasteners and HD Seam Plates	382087-0-0
1-105 IF: 1 EF: A Slope: 3/4"	Steel (WR): 18-ga., 33 ksi 54" span	Insulation: ISO 95+ GL, 1.5"-12" Pre-securement – min. 5/board Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over 1/4" DensDeck	UltraPly TPO membrane, 10' sheet	6" o.c. HD fastener and HD or Barbed Seam Plate, Single weld	3081-0-0
	20-16-ga., 80 ksi 72" span				
	22-ga., 80 ksi 60" span				
1-105 IF: 1 EF: A Slope: 3/4"	Steel (WR): 20-18-ga., 33 ksi 72" span	Insulation: ISO 95+ GL, 1.5"-12" Pre-securement – min. 5/board Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over 1/4" DensDeck	UltraPly TPO membrane, 6'- 6" sheet	6" o.c. HD fastener and HD Plate, Single weld	3074-0-0
	22-ga., 33 ksi 66" span				
	22-ga., 80 ksi 72" span				

## Steel, Mechanically Attached Insulation, Single Weld – Continued

Uplift	Deck	Insulation and Attachment	Membrane	Membrane Attachment	RoofNav #
1-105 IF: 1 EF: A Slope: 1"	Steel (WR): 22-18-ga. 33 ksi 72" span	Insulation (Top): ISO 95+ GL, 1.5"-4", Preliminary Securement.  Insulation (Bottom): ISO 95+ GL, 1.5"-8"  Optional: 4-6 mil. Polyethylene	UltraPly TPO membrane, 8' sheet	6" o.c. HD+ fastener and HD+ Seam Plate, Single weld (The roof cover is secured with stress plates and fasteners placed in the side laps (spaced 90" [2.9 m] o.c.) and an intermediate batten placed centered in the field of the roof cover.)	343455-0-0
1-105 IF: 1 EF: A Slope: 1"	Steel (WR): 22-18-ga. 33 ksi 72" span	Insulation (Top): ISO 95+ GL, 1.5"-4" Preliminary Securement.  Insulation (Bottom): ISO 95+ GL, 1.5"-8"  Optional: 4-6 mil. Polyethylene	UltraPly TPO 120 membrane, 10' sheet	6" o.c. HD+ fastener and HD+ Seam Plate, Single weld (The roof cover is secured with stress plates and fasteners placed in the side laps (spaced 114" [2.9 m] o.c.) and an intermediate batten placed centered in the field of the roof cover.)	343459-0-0
1-105 IF: 1 EF: A Slope: 1"	Steel: 22-18-ga. 33 ksi, 72" o.c. span	Insulation (Top) Required: ISO 95+ GL, 1.5"-4" Insulation (Bottom) Optional: ISO 95+ GL, 1.5"-8" Optional: 4-6 mil. Polyethylene	UltraPly TPO 10' sheet w/intermediat e attachment. See note.	114" row spacing at 6" o.c. spacing, HD Fasteners, Single Weld NOTE: Additional intermediate Batten Securement required at 57" o.c. row spacing at 6" o.c. fasteners spacing.	343409-0-0
1-105 IF: 1 EF: A Slope: 1"	22-18-ga. 33 ksi 72" span	Insulation: 1.5"-12" thick ISO 95+ GL Tapered I.S.O. RESISTA  Optional: 4/6 mil. Polyethylene or V-Force SA over ¼" DensDeck (possible primer)	60-80 mil. UltraPly TPO	Sheet Size: 5' sheet Row Spacing: 54" Fastener spacing: 12" o.c. HD Fasteners and HD Seam Plates	382086-0-0
1-105 IF: 1 EF: A Slope: 1"	22-18-ga. 80 ksi 72" span	Insulation: 1.5"-12" thick ISO 95+ GL Tapered I.S.O. RESISTA or 1.5"-12" thick ISO GARD HD Composite  Optional: 4/6 mil. Polyethylene	45-80 mil. UltraPly TPO	Sheet Size: 8' sheet Row Spacing: 90" Fastener spacing: 6" o.c.  HD Fasteners and HD Seam Plates	364311-0-0

## Steel, Insulation with Cover Board, Single Weld

Uplift	Deck	Insulation	Cover Board	Membrane	Membrane Attachment	RoofNav #
1-60 IF: 1 EF: A Slope: 5"	Steel: 20-16-ga., 33 ksi, 72" o.c. span	Insulation: ISO 95+ GL, 1.5"-12"  Attachment: Preliminary Securement	Cover Board: ¼" min., DensDeck DensDeck Prime Securock	UltraPly TPO membrane, 10' sheet	12" o.c. HD fastener and HD Seam Plate or UltraPly TPO Barbed Seam Plate, Single weld	264245-0-0
	22-ga., 33 ksi, 60" o.c. span					
	22-ga., 80 ksi, 72" o.c. span					
1-60 IF: 1 EF: A Slope: 1"	Steel: 20-16-ga., 33 ksi, 72" o.c. span	Insulation: ISO 95+ GL, 1.5"-12"  Attachment: Preliminary Securement Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over ¼" DensDeck	Cover Board: ½" ISO GARD HD ½" Structodek HD  Attachment: Preliminary Securement	UltraPly TPO membrane, 10' sheet	114" row spacing, 12" o.c. HD fastener and HD Seam Plate, Single weld	266089-0-0
	22-ga., 33 ksi, 60" o.c. span					
	22-ga., 80 ksi, 72" o.c. span					

Steel, Insulation with Cover Board, Single Weld – Continued

Uplift	Deck	Insulation	Cover Board	Membrane	Membrane Attachment	RoofNav #
1-75 IF: 1 EF: A Slope: 5"	Steel: 22-18-ga. 80 ksi, 72" o.c. span	Insulation: ISO 95+ GL, 1.5"-12" Attachment: Common Fastened Optional: 4-6 mil. Polyethylene or V-Force (SA) over 1/4" DensDeck	Cover Board: 1/4" min. DensDeck DensDeck Prime Securock  Attachment: Preliminary Securement	UltraPly TPO membrane, 10' sheet	114" row spacing, 12" o.c. HD fastener and HD Seam Plate, Single weld	381449-0-0
1-75 IF: 1 EF: A Slope: 1.75"	Steel: 22-18-ga., 80 ksi, 72" o.c. span	Insulation: ISO 95+ GL, 1.5"-12" Attachment: Common Fastened Optional: 4-6 mil. Polyethylene or V-Force (SA) over 1/4" DensDeck	Cover Board: 1/2" min. Structodek HD FiberTop B  Attachment: Preliminary Securement	UltraPly TPO membrane, 10' sheet	12" o.c. HD fastener and HD Seam Plate, Single weld	381629-0-0
1-75 IF: 1 EF: A Slope: 1"	Steel: 22-18-ga., 80 ksi, 72" o.c. span	Insulation: ISO 95+ GL, 1.5"-12" Attachment: Common Fastened Optional: 4-6 mil. Polyethylene or V-Force (SA) over 1/4" DensDeck	Cover Board: 1/2" min. Structodek HD FiberTop B Attachment: Preliminary Securement	UltraPly TPO membrane, 10' sheet	12" o.c. HD fastener and HD Seam Plate, Single weld	381672-0-0
1-75 IF: 1 EF: A Slope: 5"	Steel: 22-18-ga., 33 ksi, 72" o.c. span	Insulation: ISO 95+ GL, 3"-12" Attachment: Preliminary Securement Optional: 4-6 mil. Polyethylene	Cover Board: 1/4" min. DensDeck Securock Attachment: Preliminary Securement	UltraPly TPO membrane, 8' sheet	12" o.c. HD fastener and HD Seam Plate, Single weld	339004-0-0
1-75 IF: 1 EF: A Slope: 1"	Steel: 22-18-ga., 33 ksi, 72" o.c. span	Insulation: ISO 95+ GL, 3"-12" Attachment: Preliminary Securement Optional: 4-6 mil. Polyethylene	Cover Board: 1/2" ISOGARD HD 1/2" Structodek HD  Attachment: Preliminary Securement	UltraPly TPO membrane, 8' sheet	12" o.c. HD fastener and HD Seam Plate, Single weld	338538-0-0
1-90 IF: 1 EF: A Slope: 5"	Steel: 22-18-ga. 33 ksi, 72" o.c. span	Insulation: ISO 95+ GL, 1.5"-12" Attachment: Preliminary Securement Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over 1/4" DensDeck	Cover Board: 1/4" min. DensDeck Securock  Attachment: Preliminary Securement	UltraPly TPO membrane, 6'-6" sheet	12" o.c. HD fastener and HD Seam Plate or UltraPly TPO Barbed Seam Plate, Single weld	339174-0-0
1-90 IF: 1 EF: A Slope: 1"	Steel: 22-18-ga. 33 ksi, 72" o.c. span	Insulation: ISO 95+ GL, 1.5"-12" Attachment: Preliminary Securement Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over 1/4" DensDeck	Cover Board: 1/2" ISOGARD HD 1/2" Structodek HD  Attachment: Preliminary Securement	UltraPly TPO membrane 6'-6" sheet	12" o.c. HD fastener and HD Seam Plate, Single weld	339172-0-0
1-90  IF: 1 EF: A Slope: 1"	22-18-ga. 80 ksi 72" span	Insulation: 1.5"-12" thick ISO 95+ GL Tapered I.S.O. Optional: 4/6 mil. Polyethylene or V-Force or BASEGARD SA over 1/4" DensDeck (possible primer)	Cover Board: 1/2" ISOGARD HD 1/2" Structodek HD  Attachment: Preliminary Securement	45-80 mil. UltraPly TPO	Sheet Size: 8' sheet Row Spacing: 90" Fastener spacing: 12" o.c. HD Fasteners and HD Seam Plates	266129-0-0

## Steel, Insulation with Cover Board, Single Weld – Continued

Uplift	Deck	Insulation	Cover Board	Membrane	Membrane Attachment	RoofNav #
1-105 IF: 1 EF: A Slope: 5"	Steel (WR): 22-18-ga. 33 ksi, 72" o.c. span	Insulation: Optional Top Layer: ISO 95+ GL, 1.5"-4" Required Bottom Layer: ISO 95+ GL, 1.5"-8" Optional: 4-6 mil. Polyethylene	Cover Board: 1/4" min. DensDeck Securock  Attachment: Preliminary Securement	UltraPly TPO membrane, 10' sheet	6" o.c. HD fastener and HD Seam Plate, Single weld (UltraPly TPO MF - Lap Securement 114" OC-6" – w/Intermediate Batten Securement (57" OC - 6")	343411-0-0
1-105 IF: 1 EF: A Slope: 1"	Steel (WR): 22-18-ga. 33 ksi, 72" o.c. span	Insulation: Optional Top Layer: ISO 95+ GL, 1.5"-4" Required Bottom Layer: ISO 95+ GL, 1.5"-8" Attachment: Preliminary Securement Optional: 4-6 mil. Polyethylene	Cover Board: 1/2" ISOGARD HD 1/2" Structodek HD  Attachment: Preliminary Securement	UltraPly TPO membrane, 1 0' sheet	6" o.c. HD fastener and HD Seam Plate, Single weld (The roof cover is secured with stress plates and fasteners placed in the side laps spaced 114" [2.9 m] o.c. w/intermediate batten placed centered in the field of the roof cover)	343408-0-0
1-105 IF: 1 EF: A Slope: 1"	22-18-ga. 33 ksi 72" span	Insulation: 1.5"-12" thick ISO 95+ GL Tapered I.S.O. RESISTA Optional: 4/6 mil. Polyethylene or V-Force SA over 1/4" DensDeck (possible primer)	Cover Board: 1/2" ISOGARD HD 1/2" Structodek HD  Attachment: Preliminary Securement	60-80 mil. UltraPly TPO	Sheet Size: 60' sheet Row Spacing: 54" Fastener spacing: 12" o.c. HD Fasteners and HD Seam Plates	381676-0-0
1-105 IF: 1 EF: A Slope: 1 3/4"	22-18-ga. 33 ksi 72" span	Insulation: 1.5"-12" thick ISO 95+ GL Tapered I.S.O. RESISTA Optional: 4/6 mil. Polyethylene or V-Force SA over 1/4" DensDeck (possible primer)	Cover Board: 1/2" Structodek HD 1/2" FiberTop B  Attachment: Preliminary Securement	60-80 mil. UltraPly TPO	Sheet Size: 60' sheet Row Spacing: 54" Fastener spacing: 12" o.c.  HD Fasteners and HD Seam Plates	381634-0-0

## Concrete, Insulation with Cover Board, Single Weld

Uplift	Deck	Insulation	Cover Board	Membrane	Membrane Attachment	RoofNav #
1-60 IF: NC EF: A Slope: 5"	Concrete: 2,500 psi Min. 2" thick	Insulation: ISO 95+ GL, 1.5"-12" Attachment: Preliminary Securement	Cover Board: 1/4" min. DensDeck Securock Attachment: Preliminary Securement	UltraPly TPO membrane, 10' sheet	12" o.c. HD fastener and HD Seam Plate or UltraPly TPO Barbed Seam Plate, Single weld	269751-0-0
1-60 IF: NC EF: A Slope: 1"	Concrete: 2,500 psi Min. 2" thick	Insulation: ISO 95+ GL, 1.5"-12" Attachment: Preliminary Securement	Cover Board: 1/2" ISOGARD HD 1/2" Structodek HD Attachment: Preliminary Securement	UltraPly TPO membrane, 10' sheet	12" o.c. HD fastener and HD Seam Plate or UltraPly TPO Barbed Seam Plate, Single weld	269750-0-0
1-75 IF: NC EF: A Slope: 5"	Concrete: 2,500 psi Min. 2" thick	Insulation: ISO 95+ GL, 1.5"-12" Attachment: Preliminary Securement	Cover Board: 1/4" min. DensDeck Securock Attachment: Preliminary Securement	UltraPly TPO membrane, 10' sheet	6" o.c. HD fastener and HD Seam Plate or UltraPly TPO Barbed Seam Plate, Single weld	269742-0-0

## Concrete, Insulation with Cover Board, Single Weld – Continued

Uplift	Deck	Insulation	Cover Board	Membrane	Membrane Attachment	RoofNav #
1-75 IF: NC EF: A Slope: 1"	Concrete: 2,500 psi Min. 2" thick	Insulation: ISO 95+ GL, 1.5"-12" Attachment: Preliminary Securement	Cover Board: ½" ISOGARD HD ½" Structodek HD Attachment: Preliminary Securement	UltraPly TPO membrane, 10' sheet	6" o.c. HD fastener and HD Seam Plate or UltraPly TPO Barbed Seam Plate, Single weld	269741-0-0

## Recover, Metal Building, Insulation with Cover Board

Uplift	Deck	Flute Fill	Cover Board	Membrane	Membrane Attachment	RoofNav #
1-60 IF: 1 EF: A Slope: 1"	Standing/ Lap Seam Roof (Insulated)	ISO 95+ GL, 1" min. Max. thickness not to exceed height of rib.	Cover Board: ½" ISOGARD HD ½" Structodek HD Attachment: Preliminary Securement	UltraPly TPO membrane, 10' sheet	12" o.c. with Purlin Fasteners and HD Seam Plates, Single Weld	305074-0-0
1-60 IF: 1 EF: A Slope: 5"	Standing/ Lap Seam Roof (Insulated)	ISO 95+ GL, 1" min. Max. thickness not to exceed height of rib.	Cover Board: ¼" min. DensDeck Securock Attachment: Preliminary Securement	UltraPly TPO membrane, 10' sheet	12" o.c. with Purlin Fasteners and HD Seam Plates, Single Weld	305080-0-0
1-60 IF: 1 EF: A Slope: 1"	Standing/ Lap Seam Roof (Insulated)	ISO 95+ GL 1" min. Max. thickness not to exceed height of rib.	Cover Board: ½" ISOGARD HD ½" Structodek HD Attachment: Preliminary Securement	UltraPly TPO membrane, 6'-6" sheet	12" o.c. with Purlin Fasteners and Metal Batten Strip, Wide Weld	305058-0-0
1-60 IF: 1 EF: A Slope: 5"	Standing/ Lap Seam Roof (Insulated)	ISO 95+ GL 1" min. Max. thickness not to exceed height of rib.	Cover Board: ¼" min. DensDeck DensDeck Prime Securock Attachment: Preliminary Securement	UltraPly TPO membrane, 6'-6" sheet	12" o.c. with Purlin Fasteners and Metal Batten Strip, Wide Weld	305060-0-0
1-90 IF: 1 EF: A Slope: 1"	Standing/ Lap Seam Roof (Insulated)	ISO 95+ GL, 1" min. Max. thickness not to exceed height of rib.	Cover Board: ½" ISOGARD HD ½" Structodek HD Attachment: Preliminary Securement	UltraPly TPO membrane, 8' sheet	12" o.c. with Purlin Fasteners and HD Seam Plates, Single Weld	305221-0-0
1-105 IF: 1 EF: A Slope: 1"	Standing/ Lap Seam Roof (Insulated)	ISO 95+ GL, 1"-4" Max. thickness not to exceed height of rib.	Cover Board: ½" ISOGARD HD ½" Structodek HD Attachment: Preliminary Securement	UltraPly TPO membrane, 12'-4" sheet	6" o.c. with Purlin Fasteners and HD Seam Plates, Single Weld	265291-0-0
1-105 IF: 1 EF: A Slope: 1"	Standing/ Lap Seam Roof (Uninsulat ed)	ISO 95+ GL 1"-12" Max. thickness not to exceed height of rib.	Cover Board: ¼" min. DensDeck DensDeck Prime Securock Attachment: Preliminary Attachment	UltraPly TPO membrane,	6" o.c. with Purlin Fasteners and HD Seam Plates, Single Weld	265296-0-0
1-105 IF: 1 EF: A Slope: 1"	Standing/ Lap Seam Roof (Insulated)	ISO 95+ GL 1" min. Max. thickness not to exceed height of rib.	Cover Board: ½" ISOGARD HD ½" Structodek HD Attachment: Preliminary Attachment	UltraPly TPO membrane	142" Row Spacing, 6" o.c. with Purlin Fasteners and HD Seam Plates, Single Weld	305233-0-0
1-105 IF: 1 EF: A Slope: 5"	Standing/ Lap Seam Roof (Insulated)	ISO 95+ GL 1" min. Max. thickness not to exceed height of rib.	DensDeck, DensDeck Prime or Securock, ¼" min. Preliminary Attachment	UltraPly TPO membrane	142" Row Spacing, 6" o.c. with Purlin Fasteners and HD Seam Plates, Single Weld	305237-0-0



### Recover, Metal Building, Insulation without Cover Board

Uplift	Deck	Flute Fill	Insulation	Membrane	Membrane Attachment	RoofNav #
1-60 IF: 1 EF: A Slope: 1"	Standing/ Lap Seam Roof (Insulated)	ISO 95+ GL 1", loose laid Max. thickness not to exceed height of rib.	ISO 95+ GL .5"-1" thick, pre-securement, minimum 5 fasteners per 4'x8' board	UltraPly TPO membrane	114" Row Spacing, 12" o.c. with Purlin Fasteners and HD Seam Plates, Single Weld	305068-0-0
1-90 IF: 1 EF: A Slope: 1"	Standing/ Lap Seam Roof (Insulated)	ISO 95+ GL 1", loose laid Max. thickness not to exceed height of rib.	ISO 95+ GL .5"-1" thick, pre-securement, minimum 5 fasteners per 4'x8' board	UltraPly TPO membrane	90" Row Spacing, 12" o.c. with Purlin Fasteners and HD Seam Plates, Single Weld	305219-0-0

### Recover, Metal Building, Flute Filler with Cover Board - Invisiweld

Uplift	Deck	Flute Fill	Cover Board	Membrane	Membrane Attachment	RoofNav #
1-90 IF: 1 EF: A Slope: 1"	Standing/ Lap Seam Roof (Insulated)	ISO 95+ GL Max. thickness not to exceed height of rib.	½" ISO GARD HD ½" Structodek HD Preliminary Attachment	UltraPly TPO membrane	60" Row Spacing, 12" o.c. with Purlin Fasteners and Invisiweld Plates, Single Weld	273139-0-0

### Recover, Steel Deck, UltraPly TPO XR Membrane

Uplift	Deck	Membrane	Membrane Attachment	RoofNav #
1-60 IF: 1 EF: A Slope: ½"	Steel: any thickness/class, Recover	UltraPly TPO XR 100, 115, 135 membrane, 10' sheet	12" o.c. HD fastener and HD Seam Plate, Single weld	242937-0-0
1-90 IF: 1 EF: A Slope: ½"	Steel: 80 ksi Recover	UltraPly TPO XR 100, 115, 135 membrane, 10' sheet	12" o.c. HD+ fastener and HD+ Seam Plate, Single weld	242946-0-0
1-90 IF: 1 EF: A Slope: ½"	Steel: any thickness/class, Recover	UltraPly TPO XR 100, 115, 135 membrane, 10' sheet	6" o.c. HD fastener and HD+ Seam Plate, Single weld	242950-0-0
1-135 IF: 1 EF: A Slope: ½"	Steel: any thickness/class, Recover	UltraPly TPO XR 100, 115, 135 membrane, 10' sheet	6" o.c. HD+ fastener and HD+ Seam Plate, Single weld	242951-0-0

### Recover, Concrete Deck, UltraPly TPO XR Membrane

Uplift	Deck	Membrane	Membrane Attachment	RoofNav #
1-60 IF: NC EF: A Slope: ½"	Concrete: Recover	UltraPly TPO XR 100, 115, 135 membrane, 10' sheet	12" o.c. HD fastener and HD Seam Plate, Single weld	<b>242935-0-0</b>
1-90 IF: NC EF: A Slope: ½"	Concrete: Recover	UltraPly TPO XR 100, 115, 135 membrane, 10' sheet	6" o.c. HD fastener and HD Seam Plate, Single weld	242949-0-0

### Invisiweld System, Induction Welded – Insulation and No Cover Board

Uplift	Deck	Insulation	Insulation Attachment	Membrane	Membrane Attachment	RoofNav #
1-90 IF: 1 EF: A Slope: ¾"	Steel: 22-16-ga. 33 ksi 72" span	Insulation: ISO 95+ GL, 1.5"-12" thick Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over ¼" DensDeck	6 HD fasteners and Invisiweld Plates per 4'x8' boards	UltraPly TPO membrane, Single weld	Invisiweld System	250651-0-0
1-90 IF: 1 EF: A Slope: ¾"	Steel: 22-16-ga. 33 ksi, 72" span	Insulation: ISO 95+ GL, 1.5"-12", 4'x8' boards Thermal Barrier: DensDeck, ¼" thick, 4'x8' boards	6 HD fasteners and Invisiweld Plates per 4'x8' boards	UltraPly TPO membrane, Single weld	Invisiweld System	399280-0-0

## Invisiweld System, Induction Welded – Insulation and Cover Board

Uplift	Deck	Insulation	Cover Board	Attachment	Membrane – Weld to Invisiweld Plates	RoofNav #
1-90 IF: 1 EF: A Slope: 1"	Steel: 22-16-ga. 33 ksi 72" span	Insulation: ISO 95+ GL 1.5"-12" thick Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over 1/4" DensDeck	Cover Board: 1/2" ISOGARD HD 1/2" Structodek HD	6 HD fasteners and Invisiweld Plates per 4'x8' boards	UltraPly TPO membrane, Single weld	277978-0-0
1-90 IF: 1 EF: A Slope: 5"	Steel: 22-16-ga. 33 ksi 72" span	Insulation: ISO 95+ GL 1.5"-12" thick Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over 1/4" DensDeck	Cover Board: 1/4" min. DensDeck Securock	6 HD fasteners and Invisiweld Plates per 4'x8' boards	UltraPly TPO membrane, Single weld	277977-0-0
1-90 IF: NC EF: A Slope: 3/4"	Concrete: 2500 psi Min. 2" thick	Insulation: ISO 95+ GL 1.5"-12" thick	None	6 HD or Concrete Drive fasteners and Invisiweld Plates per 4'x8' boards	UltraPly TPO membrane, Single weld	250819-0-0
1-90 IF: NC EF: A Slope: 1"	Concrete: 2500 psi Min. 2" thick	Insulation: ISO 95+ GL 1.5"-12" thick	Cover Board: 1/2" ISOGARD HD 1/2" Structodek HD	6 HD or Concrete Drive fasteners and Invisiweld Plates per 4'x8' boards	UltraPly TPO membrane, Single weld	251817-0-0
1-90 IF: NC EF: A Slope: 5"	Concrete: 2500 psi Min. 2" thick	Insulation: ISO 95+ 1.5"-12" thick	Cover Board: 1/4" DensDeck 1/4" DensDeck Prime 1/4" Securock	6 HD or Concrete Drive fasteners and Invisiweld Plates per 4'x8' board	UltraPly TPO membrane, Single weld	251833-0-0
1-120 IF: 1 EF: A Slope: 3/4"	Steel: 22-18-ga. 33 ksi 72" span	Insulation: 4'x8' boards ISO 95+ GL 1.5"-12" thick Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over 1/4" DensDeck	None	24" rows spacing 24" on center Invisiweld Plates and HD Fasteners	UltraPly TPO membrane, Single weld	254071-0-0
1-120 IF: 1 EF: A Slope: 1"	Steel (WR): 22-18-ga. 33 ksi 72" span	Insulation: 4'x8' boards ISO 95+ GL 1.5"-12" thick Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over 1/4" DensDeck	Cover Board: 4'x8' boards 1/2" ISOGARD HD 1/2" Structodek HD	24" rows spacing 24" on center Invisiweld Plates and HD Fasteners	UltraPly TPO membrane, Single weld	278052-0-0
1-120 IF: 1 EF: A Slope: 5"	Steel (WR): 22-18-ga. 33 ksi 72" span	Insulation: 4'x8' boards ISO 95+ GL 1.5"-12" thick Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over 1/4" DensDeck	Cover Board: 4'x8' boards 1/4" DensDeck 1/4" DensDeck Prime 1/4" Securock	24" rows spacing 24" on center Invisiweld Plates and HD Fasteners	UltraPly TPO membrane, Single weld	278051-0-0
1-120 IF: NC EF: A Slope: 3/4"	Concrete: 2500 psi Min. 2" thick	Insulation: 4'x8' boards ISO 95+ GL 1.5"-12" thick	None	8 HD or Concrete Drive fasteners and Invisiweld Plates per 4'x8' board	UltraPly TPO membrane, Single weld	254075-0-0
1-120 IF: NC EF: A Slope: 1"	Concrete: 2500 psi Min. 2" thick	Insulation: 4'x8' boards ISO 95+ GL 1.5"-12" thick	Cover Board: 1/2" ISOGARD HD 1/2" Structodek HD	8 HD or Concrete Drive fasteners and Invisiweld Plates per 4'x8' board	UltraPly TPO membrane, Single weld	254076-0-0

Invisiweld System, Induction Welded – Insulation and Cover Board – Continued

Uplift	Deck	Insulation	Cover Board	Attachment	Membrane – Weld to Invisiweld Plates	RoofNav #
1-120 IF: NC EF: A Slope: 5"	Concrete: 2500 psi Min. 2" thick	Insulation: 4'x8' boards ISO 95+ GL 1.5"-12" thick	Cover Board: 4'x8' boards ¼" DensDeck ¼" DensDeck Prime ¼" Securock	8 HD or Concrete Drive fasteners and Invisiweld Plates per 4'x8' board	UltraPly TPO membrane, Single weld	254078-0- 0
1-150 IF: 1 EF: A Slope: ¾"	Steel (WR): 22-18-ga. 33 ksi 72" span	Insulation: 4'x8' boards ISO 95+ GL 1.5"-12" thick Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over ¼" DensDeck	None	12 HD fasteners and Invisiweld Plates per 4'x8' board	UltraPly TPO membrane, Single weld	253954-0- 0
1-150 IF: 1 EF: A Slope: 1"	Steel (WR): 22-18-ga. 33 ksi 72" span	Insulation: 4'x8' boards ISO 95+ GL 1.5"-12" thick Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over ¼" DensDeck	Cover Board: 4'x8' boards ½" ISOGARD HD ½" Structodek HD	12 HD fasteners and Invisiweld Plates per 4'x8' board	UltraPly TPO membrane, Single weld	254053-0- 0
1-150 IF: 1 EF: A Slope: 5"	Steel (WR): 22-18-ga. 33 ksi 72" span	Insulation: 4'x8' boards ISO 95+ GL 1.5"-12" thick Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over ¼" DensDeck	Cover Board: 4'x8' boards ¼" DensDeck ¼" DensDeck Prime ¼" Securock	12 HD fasteners and Invisiweld Plates per 4'x8' board	UltraPly TPO membrane, Single weld	254055-0- 0
1-150 IF: NC EF: A Slope: ¾"	Concrete: 2500 psi Min. 2" thick	Insulation: 4'x8' boards ISO 95+ GL 1.5"-12" thick	None	12 HD or Concrete Drive fasteners and Invisiweld Plates per 4'x8' board	UltraPly TPO membrane, Single weld	254056-0- 0
1-150 IF: NC EF: A Slope: 1"	Concrete: 2500 psi Min. 2" thick	Insulation: 4'x8' boards ISO 95+ GL 1.5"-12" thick	Cover Board: 4'x8' boards ½" ISOGARD HD ½" Structodek HD	12 HD Concrete Drive fasteners and Invisiweld Plates per 4'x8' board	UltraPly TPO membrane, Single weld	254057-0- 0
1-150 IF: NC EF: A Slope: 5"	Concrete: 2500 psi Min. 2" thick	Insulation: 4'x8' boards ISO 95+ GL 1.5"-12" thick	Cover Board: 4'x8' boards ¼" DensDeck ¼" DensDeck Prime ¼" Securock	12 HD Concrete Drive fasteners and Invisiweld Plates per 4'x8' board	UltraPly TPO membrane, Single weld	254059-0- 0
1-210 IF: 1 EF: A Slope: ¾"	Steel (WR): 20-18-ga. 33 ksi, 72" span	Insulation: 4'x8' boards ISO 95+ GL 1.5"-12" thick Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over ¼" DensDeck	Cover Board: 4'x8' boards ½" ISOGARD HD ½" Structodek HD	24" rows spacing 12" on center Invisiweld Plates and HD Fasteners	UltraPly TPO membrane, Single weld	254090-0- 0
	22-ga. 33 ksi 64" span					
	22-18-ga. 80 ksi 72" span					

Invisiweld System, Induction Welded – Insulation and Cover Board – Continued

Uplift	Deck	Insulation	Cover Board	Attachment	Membrane – Weld to Invisiweld Plates	RoofNav #
1-210 IF: 1 EF: A Slope: 1"	Steel (WR): 20-18-ga. 33 ksi 72" span	Insulation: 4'x8' boards ISO 95+ GL 1.5"-12" thick Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over 1/4" DensDeck	Cover Board: 4'x8' boards 1/2" ISOGARD HD 1/2"-1" Structodek HD	24" rows spacing 12" on center Invisiweld Plates and HD Fasteners	UltraPly TPO membrane, Single weld	278067-0-0
	22-ga. 33 ksi 64" span					
	22-18-ga. 80 ksi 72" span					
1-210 IF: 1 EF: A Slope: 5"	Steel (WR): 20-18-ga. 33 ksi 72" span	Insulation: 4'x8' boards ISO 95+ GL 1.5"-12" thick Optional: 4-6 mil. Polyethylene or V-Force (SA) or BASEGARD SA over 1/4" DensDeck	Cover Board: 4'x8' boards 1/4" DensDeck 1/4" Securock	24" rows spacing 12" on center Invisiweld Plates and HD Fasteners	UltraPly TPO membrane, Single weld	278066-0-0
	22-ga. 33 ksi 64" span					
	22-18-ga. 80 ksi 72" span					
1-210 IF: NC EF: A Slope: 3/4"	Concrete: 2500 psi Min. 2" thick	Insulation: 4'x8' boards ISO 95+ GL 1.5"-12" thick	None	16 HD or Concrete Drive fasteners and Invisiweld Plates per 4'x8' board	UltraPly TPO membrane, Single weld	254112-0-0
1-210 IF: NC EF: A Slope: 1"	Concrete: 2500 psi Min. 2" thick	Insulation: 4'x8' boards ISO 95+ GL 1.5"-12" thick	Cover Board: 4'x8' boards ISOGARD HD 1/2" or Structodek HD 1/2"- 1"	16 HD Concrete Drive fasteners and Invisiweld Plates per 4'x8' board	UltraPly TPO membrane, Single weld	254115-0-0
1-210 IF: NC EF: A Slope: 5"	Concrete: 2500 psi Min. 2" thick	Insulation: 4'x8' boards ISO 95+ GL 1.5"-12" thick	Cover Board: 4'x8' boards 1/4" DensDeck 1/4" DensDeck Prime 1/4" Securock	16 HD Concrete Drive fasteners and Invisiweld Plates per 4'x8' board	UltraPly TPO membrane, Single weld	254119-0-0

**Recover, Metal Building, Invisiweld System, Induction Welded**

Uplift	Deck	Flute Fill	Insulation	Attachment	Membrane – Weld to Invisiweld Plates	RoofNav #
1-90 IF: 1 EF: A Slope: 1"	Steel: Standing Seam Insulated	ISO 95+ GL, 1/2" thick	ISO 95+ GL/ISOGARD GL, 1/2" thick, 5 HD fasteners and Insulation Plates per 4'x8' board	12" on center Purlin fastener and Invisiweld Plate, 60" row spacing	UltraPly TPO	273140-0-0
1-105 IF: 1 EF: A Slope: 3/4"	Steel: Standing Seam	ISO 95+ GL, 1.5"-8" thick	ISO 95+ GL/ISOGARD GL, 1.5"-4" thick, 5 HD fasteners and Insulation Plates per 4'x8' board	6" on center Purlin fastener and Invisiweld Plate, 120" row spacing	UltraPly TPO	253893-0-0
1-105 IF: 1 EF: A Slope: 3/4"	Steel: Standing Seam	ISO 95+ GL, 1"-4" thick	ISOGARD HD, 1/2" or Structodek HD 1/2"-1" thick Preliminary Attachment	6" on center Purlin fastener and Invisiweld Plate, 120" row spacing	UltraPly TPO	253890-0-0
1-105 IF: 1 EF: A Slope: 1 3/4"	Steel: Standing Seam	ISO 95+ GL, 1"-4" thick	OSB, 3/8"- 1/2" thick, 5 HD fasteners and Insulation Plates per 4'x8' board	6" on center Purlin fastener and Invisiweld Plate, 120" row spacing	UltraPly TPO	253897-0-0
1-105 IF: 1 EF: A Slope: 5"	Steel: Standing Seam	ISO 95+ GL, 1"-12" thick	DensDeck/DensDeck Prime, or Securock, 1/4" min., 5 HD fasteners and Insulation Plates per 4'x8' board	6" on center Purlin fastener and Invisiweld Plate, 120" row spacing	UltraPly TPO	253900-0-0

## Invisiweld-S System, Induction Welded

Uplift	Deck	Insulation	Attachment	Membrane – Weld to Invisiweld Plates	RoofNav #
1-150 IF: NC EF: A Slope: 3/4"	Concrete: 2500 psi Min. 2" thick	Insulation: 4'x8' boards, ISO 95+ GL 1.5"-12" thick	10 HD or Concrete Drive fasteners and Invisiweld-S Plates per 4'x8' board	UltraPly TPO membrane, Single weld	382976-0-0
1-150	Steel Deck (WR): 22-18 ga. 33 ksi. 72" span	Required: ISO 95+ GL 1.5"-12" thick Optional: 4-6 mil. Poly or V-Force SA over DensDeck	10 HD fasteners and Invisiweld-S Plates per 4'x8' board	UltraPly TPO membrane, Single Weld	382977-0-0

## Re-cover over Treated Wood Deck – InvisiWeld Attached Membrane

Uplift	Deck	Insulation	Cover Board	Attachment	Membrane – Weld to Invisiweld Plates	RoofNav #
1-90 IF: 1 EF: A Slope: 3/4"	Treated Wood (Re-cover)	ISO 95+ GL 1/2"-1" thick	None	6 AP fasteners and Invisiweld Plates per 4'x8' board	.045 mil. min. UltraPly TPO	250823-0-0
1-90 IF: 1 EF: A Slope: 1"	Treated Wood	ISO 95+ GL 1/2" min. thick	1/2" ISOGARD HD or Structodek HD Fiberboard	6 AP fasteners and Invisiweld Plates per 4'x8' board	.045 mil. min. UltraPly TPO	251855-0-0

## Factory Mutual Ballast Guidelines

### Stone Ballast

ASTM D448 Standard Size No. 3 for Coarse Aggregate (nominal 1-2" [25 to 50 mm] diameter). This standard permits amounts (by weight percent) to pass through the square sieve openings as shown in the Gradation for No. 3 Stone table below.

Gradation for No. 3 Stone							
Size Number	Nominal Size Inches (mm)	Sieve Opening Inches (mm)					
		2 1/2 (63)	2 (50)	1 1/2 (38)	1 (25)	3/4 (19)	1/2 (13)
3	1 to 2 (25 – 50)	100	90 to 100	35 to 70	0 to 15	--	0 to 5

### Aggregate Surfacing for BUR

ASTM D1863 Mineral Aggregate Used on Built-Up Roofs gives gradation and moisture content for aggregate surfacing as noted in the Gradation for Gravel for BUR's table below.

Gradation for Gravel for BUR's			
Sieve	Amounts Finer than Sieve Specified (Mass %)		
	Size 6	Size 67	Size 7
25 mm	100	100	---
19 mm	90 to 100	90 to 100	100
12.5 mm	20 to 55	---	90 to 100
9.5 mm	0 to 15	20 to 55	40 to 70
4.75 mm	0 to 5	0 to 10	0 to 15
2.36 mm	---	0 to 5	0 to 5

**NOTE:**  
The moisture content limit for stone is ≤ 2 percent and ≤ 5 percent for slag.  
The dust content limit for stone and slag is ≤ 2 percent.

## **Factory Mutual – Very Severe Hail – DensDeck StormX Prime**

The VHS Listings – Fully Adhered TPO with Adhered DensDeck StormX Prime Cover Board table has been provided at the end of this document. This table lists options that qualify for Very Severe Hail (VSH) ratings from FM Approvals. This table does not represent the full spectrum of assemblies available and FM Approvals and RoofNav.com should be consulted for a full list of qualifying assemblies.

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VSH Listings | Fully Adhered TPO with Adhered DensDeck StormX Prime Cover Board

Updated: 02/09/2020

Mechanically Attached Base Layer of Insulation with Adhered Cover Board

Roof Nav #	max. slope (x:12)	Vapor Barrier			Mech. Attach. Base Layer Min. Thick.				Base ISO Attachment Rate	Insulation Adhesive					2nd Layer Min. Thick.				Insulation / Cover Board Bead Spacing	Cover Board	Membrane		Bonding				
		Poly	V-Force Thermal Barrier	Thermal Barrier	ISO 95+ GL	Resista	ISO GARD GL	ISO GARD CG		ISO Stick	TwinJet	Twin Pack	ISO Spray	ISO Fix	ISO 95+ GL	Resista	ISO GARD GL	ISO GARD CG			UltraPly TPO	SP LVOC	SP LVOC 1168	UP BA	WBBA-P	Jet Bond	
<b>Adhered TPO Systems Over 22 Gauge, 33 ksi Steel Deck</b>																											
<b>75 PSF</b>																											
480636-0-0	2.50			O	1.5 - 24	1.5 - 24	2.3 - 13	2.3 - 13	8			X	X							StormX	60 - 80	X	X	X	X		
480265-0-0	2.50		R		2 - 12	2 - 12	2.3 - 13	2.3 - 13	8			X	X							StormX	60 - 80	X	X	X	X		
408246-0-0	2.5			O	2 - 8	2 - 8	2.3 - 13	2.3 - 13	8	X	X	X	X	X	1.5 - 4	1.5 - 4	2.3 - 13	2.3 - 13	12	StormX	60 - 80	X	X	X	X		
480634-0-0	2.5			O	1.5 - 4	1.5 - 4	2.3 - 13	2.3 - 13	8	X	X	X	X	X	0.5 - 20	0.5 - 20	2.3 - 13	2.3 - 13	12	StormX	60 - 80	X	X	X	X		
480263-0-0	2.5		R		2 - 4	2 - 4	2.3 - 13	2.3 - 13	8	X	X	X	X	X	0.5 - 9.8	0.5 - 9.8	2.3 - 13	2.3 - 13	12	StormX	60 - 80	X	X	X	X		
<b>90 PSF</b>																											
480267-0-0	2.5				2 - 12	2 - 12	2.3 - 13	2.3 - 13	8			X							12	StormX	60 - 80	X	X			X	
480865-0-0	2.5			O	2.2 - 12	2.2 - 12	2.3 - 13	2.3 - 13	8	X	X	X	X	X					12	StormX	60 - 80	X	X	X	X		
480833-0-0	2.5		R		1.5 - 24	1.5 - 24	2.3 - 13	2.3 - 13	16			X	X						12	StormX	60 - 80		X	X			
480864-0-0	2.5		R		2.2 - 12	2.2 - 12	2.3 - 13	2.3 - 13	8	X	X	X	X	X					12	StormX	60 - 80	X	X	X	X		
480260-0-0	2.5			O	2.2 - 4	2.2 - 4	2.3 - 13	2.3 - 13	8	X	X	X	X	X	0.5 - 9.8	0.5 - 9.8	2.3 - 13	2.3 - 13	12	StormX	60 - 80	X	X	X	X		
480259-0-0	2.5		R		2.2 - 4	2.2 - 4	2.3 - 13	2.3 - 13	8	X	X	X	X	X	0.5 - 9.8	0.5 - 9.8	2.3 - 13	2.3 - 13	12	StormX	60 - 80	X	X	X	X		
<b>165 PSF</b>																											
480137-0-0	2.5	O	O		2 - 12		2.3 - 13		32	X	X	X	X	X					4	StormX	60 - 80	X	X	X			
480859-0-0	2.5		R		2 - 24		2.3 - 13		32	X	X	X	X	X					4	StormX	60 - 80	X	X	X			
<b>See listing for steel deck information. - 210 PSF</b>																											
480088-0-0	2.5	O	O		2 - 12		2.3 - 13		32	X	X	X	X	X					4	StormX	60 - 80	X	X	X			
480857-0-0	2.5		R		2 - 24		2.3 - 13		32	X	X	X	X	X					4	StormX	60 - 80	X	X	X			

Notes:

1. Refer to RoofNav assembly for complete information/requirements.
2. It is the responsibility of the designer/user to validate assemblies in the chart for accuracy and warranty.
3. DD = DensDeck, DDP = DensDeck Prime, Securock GF = Securock Gypsum Fiber
4. Must use primer when adhering V-Force to substrate board.
5. Verify insulation thickness requirements if ISOAGARD GL or ISO GARD CG are used in the assembly.

FM Prescriptive Enhancements for assemblies with Field uplift of X or less:

Hurricane Region with 90 psf or less or a Non-Hurricane Region with 105 psf or Less

1. Use assembly to meet each zone uplift requirement
2. Use assembly to meet max roof uplift across the entire roof
3. Perimeter = Minimum 1.5 times the field rate of attachment but not less than 16/board (Contributory Area: 2 or less)  
Corner = Minimum 32 per board (Contributory Area: 1)

FM Prescriptive Enhancements - Adhesive

Perimeter = Install rows not more than 67% of the Field spacing

Corner = Install rows not more than 50% of the Field spacing