UL Solutions Evaluation Report

UL ER9228-01

Issued: 2013-08-30
Revised: 2024 -11-20

Visit the UL Solutions Product iQ® database for current status of report.

UL Solutions Category Code: ULFB – Membrane Roofing

CSI MasterFormat®
DIVISION: 07 00 00 – Thermal and Moisture Protection
Sub-level 2: 07 50 00 – Membrane Roofing
Sub-level 3: 07 54 00 – Thermoplastic Membrane Roofing
Sub-level 4: 07 54 19 – Polyvinyl-Chloride Roofing

COMPANY:

Flex Membrane International Corp.
5103A Pottsville Pike
Reading, PA 19605 United States
www.flexroofingsystems.com

1. Subject:

FLEX TRIPOLYMER FB, FLEX TRIPOLYMER MF/R, FLEX MFR PVC, FLEX MFR PVC FB, FLEX DECK FLEX KEE XT, AND FLEX KEE XT FB ROOFING MEMBRANES

UL Solutions

2. Scope of Evaluation

- 2024, 2021, 2018, and 2015 *International Building Code*® (IBC)
- 2024, 2021, 2018, and 2015 *International Residential Code*® (IRC)
- Acceptance Criteria for Membrane Roof-Covering Systems (AC75)
- Acceptance Criteria for Quality Documentation AC10

The products underwent evaluation for the following properties:

- Roofing Systems for Exterior Fire Exposure
- Roofing Systems for Wind Uplift Resistance
- Physical Properties
- Impact Resistance

3. Referenced documents

- UL790 (ASTM E108), Standard Test Methods for Fire Tests of Roof Coverings
- UL 1897, Standard for Uplift Tests for Roof Covering Systems
- ASTM D4434, Standard Specification for Poly (Vinyl Chloride) Sheet Roofing.
- ASTM G155, Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials
- FM 4470, Single-Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for use in Class 1 and Noncombustible Roof Deck Construction
- FM 4474, Evaluating the Simulated Wind Uplift Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures
- ICC ES Acceptance Criteria for Membrane Roof-Covering Systems (AC75)
- ICC ES Acceptance Criteria for Quality Documentation (AC10)

4. Uses

Flex Tripolymer MF/R, Flex MFR PVC, Flex MFR PVC FB, Flex Tripolymer FB, and Flex Deck membranes are single-ply membranes used as roof coverings in mechanically fastened or fully adhered Class A, B, or C roof assemblies installed on combustible or noncombustible decks.

5. Production description

5.1 Fire Classification:

Roofing assemblies covered under this report have been tested for fire classification Class A, B, or C in accordance with UL 790 (ASTM E108), as required by Section 1505.1 of the IBC and Section R902.1 of the IRC.

5.2 Wind Uplift Resistance:

Roofing assemblies covered under this report have been tested for wind uplift resistance in accordance with FM 4474 or UL 1897, and therefor qualify for use under Roofing membranes Section 1504.4 of the IBC.

The roofing assemblies shall be designed to resist the design wind load pressures for components and cladding in accordance with Section 1609 of the IBC.

5.3 Physical Properties:

The roofing membranes covered under this Report have been tested for physical properties in accordance with ASTM D4434 and ASTM G155, and therefore qualify for use under Section 1507.12.2 and Section 1504.7 of the IBC.

5.4 Impact Test:

Flex Membrane single ply membranes covered under this Report have been tested for impact resistance in accordance with "Resistance to Foot Traffic Test" in Section 5.5 of FM 4470 and therefore qualify for use under Section 1504.8 of the IBC.

5.5 Insulation:

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

5.6 Fasteners:

Fasteners used to mechanically fasten insulation and membranes to the roof deck, shall be corrosion resistant shall and shall be one of the fasteners noted in Table 2 or Table 3.

5.7 Adhesive:

The adhesive used to adhere Flex Tripolymer MF/R, Flex MFR PVC, Flex MFR PVC FB, Flex Tripolymer FB, and Flex Deck membranes to the insulation or roofing substrate shall be as noted in Table 2 and Table 3.

5.8 Asphalt:

Hot roofing asphalt, when specified in the roofing assemblies shall conform to ASTM D312, Type III or Type IV.

6. Design & installation

6.1 General:

Flex Membrane single ply membranes shall be installed in accordance with the applicable code, this report and the manufacturer's published installation instructions. The membranes shall be installed in accordance with Section 1507.12 of the IBC or Section R905.13 of the IRC as applicable, except as noted in this report.

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

The slope of the roof on which the membranes are installed shall be a minimum of ¼:12 (2% slope and shall not be more than the maximum slope indicated in Table 2 and Table 3.

Penetrations and terminations of the roof covering shall be flashed and made watertight in accordance with the requirements of the membrane manufacturer and applicable code.

6.2 Fire Classification:

6.2.1 New Construction: Roof assemblies utilizing Flex Tripolymer MF/R, Flex MFR PVC, Flex MFR PVC FB, Flex Tripolymer FB, and Flex Deck membranes are described in Table 2 and Table 3.

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

Flex Tripolymer MF/R, Flex MFR PVC, Flex MFR PVC FB, Flex Tripolymer FB, and Flex Deck membranes may be installed over existing Classified Class A, B or C roofing systems as described in the UL Product Certification Category for Roofing Materials (TGFU), File No R9228, under the heading of Maintenance and Repair.

6.3 Wind Resistance:

6.3.1 New Construction: The allowable wind uplift pressures for the roof assemblies are noted in Table 2. Metal edge securement for all systems shall be designed in accordance with SPRI ES-1, complying with IBC Section 1504.6. For certifications of metal edge securement systems in accordance with SPRI ES-1, see UL Online Certifications Directory Roof-edge Systems, Metal, for Use with Low-slope Roofing Systems (TGJZ).

6.3.2 Reroofing: Roof covering systems employing mechanical fasteners shall be qualified, to the satisfaction of the code official, as to the adequacy of fasteners penetrating through existing roof coverings into structural substrates. Since the composition and/or condition of any underlying existing roofing materials may vary, reroofing material may vary, reroofing with adhered systems is outside the scope of this report.

7. Condition of use

7.1 General:

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

7.2 Materials and methods of installation shall comply with this Report and the manufacturer's published installation instructions. In the event of a conflict between the installation instructions and this report, this report governs.

7.3 The membrane shall be installed by authorized applicators approved by Flex Membrane International.

7.4 See UL Product iQ™ database for Roofing Systems (TGFU) and (TGIK). Refer to Table 2 and Table 3.

7.5 Above-deck thermal insulation board shall comply with the applicable standards listed in Table of Section 1508.2 with IBC.

7.6 Wind uplift pressures on any particular roof area including edges and corner zones shall not exceed the allowable wind pressure for the roof covering installed in that particular area. Refer to Table 2 and Table 3.

7.7 The allowable wind uplift pressures listed in Table 2 and Table 3 are for the roof systems only. The deck and framing to which the roofing system is attached shall be designed for the applicable components and cladding, wind loads in accordance with the applicable code.

7.8 When application is over an existing roof, documentation of the wind uplift resistance of the composite roof construction shall be submitted to the code official.

7.9 The metal edge securement shall be designed and installed for wind loads in accordance with Chapter 16 of the IBC and tested for resistance in accordance with Test Methods RE-1, RE-2, and RE-3 of SPRI ES-1, except V_{ult} wind speed shall be determined from the Figures in 1609 as applicable.

7.10 The products are manufactured at the locations listed in Table 1 of this Report under the UL LLC Classification and Follow-Up Service Program, which includes audits in accordance with quality elements of ICC-ES Acceptance Criteria for Quality Documentation, AC 10.

Location	Plant ID (if applicable)
1227 CENTRAL AVE HILLSIDE NJ 07205	Bakersfield, CA

8. Supporting evidence

8.1 Data in accordance with ICC-ES Acceptance Criteria for Membrane Roof-Covering Systems, AC75.

8.2 Manufacturer's descriptive product literature, including installation instructions.

8.3 UL test reports and Classification Reports in accordance with UL 790 and UL 1897. See UL Product Certification Category for Roofing Systems (TGFU) and (TGIK).

8.4 Data in accordance with FM 4474.

8.5 Data in accordance with FM 4470.

8.6 Data in accordance with ASTM D4434 and ASTM G 155.

8.7 Documentation of quality system elements in accordance with ICC-ES Acceptance Criteria for Quality Documentation, AC10.

9. Identification

Flex Membrane single ply membranes described in this Evaluation Report are identified by a marking bearing the report holder's name (Flex Membrane), the plant identification, the product name, the UL Classification Mark and the evaluation report number UL ER9228-01. The validity of this Evaluation Report is contingent upon this identification appearing on the product.

10. Use of UL Evaluation Report

10.1 The approval of building products, materials or systems is under the responsibility of the applicable code authorities.

10.2 UL Solutions Evaluation Reports shall not be used in any manner that implies an endorsement of the product, material or system by UL Solutions.

10.3 The status of this report, as well as a complete directory of UL Solutions Evaluation Reports, may be found at UL.com/Solutions via Product iQ®.

Table – 2
Fire and Wind Resistance Assemblies – Adhered

System No.	1
Deck	Primed structural concrete deck
Vapor Retarder	Two plies of Type G1 adhered to deck with Type III hot asphalt applied at 25 lbs./100 sq. ft.
Insulation[1]	Min. 1.57 in. thick "FOAMGLAS" Ready Board (GF) installed in single or multiple layers to a max. thickness of 5.1 in. adhered to the vapor retarder and each other with Type III hot asphalt applied at 25 lbs./100 sq. ft.
Ply Sheet	Two plies of Type G1 adhered to deck with Type III hot asphalt applied at 25 lbs./100 sq. ft.
Membrane	Min. 0.045 in. thick Tripolymer FB is adhered to the base sheet with Type III hot asphalt applied at 25 lbs./100 sq. ft.
Tested Pressure (psf)	720
Allowable Wind Uplift Pressure (psf)[4]	-360
ASTM E108 External Fire Rating	Class A at maximum ½ in. incline

System No.	2
Deck	Primed structural concrete deck
Vapor Retarder	Two plies of Type G1 adhered to deck with Type III hot asphalt applied at 25 lbs./100 sq. ft.
Insulation[1]	Min. 1.5 in. thick "FOAMGLAS" Blocks installed in single or multiple layers to a max. thickness of 5.0 in. adhered to the vapor retarder and each other with Type III hot asphalt applied at 25 lbs./100 sq. ft.
Ply Sheet	Two plies of Type G1 adhered to insulation with Type III hot asphalt applied at 25 lbs./100 sq. ft.
Membrane	Min. 0.045 in. thick Tripolymer FB is adhered to the base sheet with Type III hot asphalt applied at 25 lbs./100 sq. ft.
Tested Pressure (psf)	990
Allowable Wind Uplift Pressure (psf)[4]	-495
ASTM E108 External Fire Rating	Class A at maximum ½ in. incline

System No.	3
Deck	Primed structural concrete deck
Vapor Retarder	One ply of Type GAFGLAS Ply 4 adhered to deck with Type III hot asphalt applied at 25 lbs./100 sq. ft.
Insulation[1]	Maximum 48 X 48 X 1.5 inch thick Flex ISO II, installed in single or multiple layers to a maximum of 12 inches with Type III hot asphalt applied at 25 lbs./100 sq. ft.
Cover Board	Min. ¼ in. USG Co. "SECUROCK Fiber Roof Board" fully adhered to the base sheet with Type III hot asphalt applied at 25 lbs./100 sq. ft.
Base and Ply	Two plies of Type GAFGLAS Ply 4 adhered to deck with Type III hot asphalt applied at 25 lbs./100 sq. ft
Membrane	Min. 0.045 in. thick Tripolymer FB is fully adhered to the base sheet with Type III hot asphalt applied at 25 lbs./100 sq. ft.
Tested Pressure (psf)	450
Allowable Wind Uplift Pressure (psf)4	-225
ASTM E108 External Fire Rating	Class A at maximum 1/2 :12 incline

System No.	4
Deck	Primed structural concrete deck
Vapor Retarder	One ply of SBS 80 s/s Base adhered to deck with Type III hot asphalt applied at 25 lbs./100 sq. ft.
Insulation[1]	Maximum 48 X 48 X 1.5 inch thick Flex ISO II, installed in single or multiple layers to a maximum of 12 inches with Type III hot asphalt applied at 25 lbs./100 sq. ft.
Cover Board	Min. ¼ in. USG Co. "SECUROCK Fiber Roof Board" fully adhered to the base sheet with Type III hot asphalt applied at 25 lbs./100 sq. ft.
Base and Ply	One ply of SBS 80 s/s Base adhered to deck with Type III hot asphalt applied at 25 lbs./100 sq. ft
Membrane	Min. 0.045 in. thick Tripolymer FB is fully adhered to the base sheet with Type III hot asphalt applied at 25 lbs./100 sq. ft.
Tested Pressure (psf)	510
Allowable Wind Uplift Pressure (psf)4	-255
ASTM E108 External Fire Rating	Class A at maximum $^{1}/_{2}$:12 incline

System No.	5
Deck	Structural concrete deck primed with Elastocol Primer applied at ½ gal/100 ft^2
Vapor Retarder	0.045 in. thick SopraVap'r, self-adhered
Insulation[1]	Minimum 1.5 inch thick Flex ISO II ribbon adhered with Millennium One Step Foamable Adhesive, OlyBond 500 Adhesive Fastener, or Millennium PG 1 Pump Grade Adhesive applied in ½ in. wide beads 12 in. oc.
Insulation (Cover Board)	Min. ¼ in. thick Georgia-Pacific Gypsum LLC "DensDeck Prime® Roofboard", ribbon adhered in ½ in. wide beads 12 in. oc.
Membrane	Min. 0.045 in. thick Flex Tripolymer MF/R or Flex Deck or min. 0.050 in. thick Flex MFR PVC is fully adhered with TACC LA-432-M or Ashland Pliobond 2375 Adhesive applied at 1 gal/120 ft^2.
Tested Pressure (psf)	135
Allowable Wind Uplift Pressure (psf)4	-67.5
ASTM E108 External Fire Rating	Class A at maximum $^{1}/_{2}$:12 incline

System No.	6
Deck	Structural concrete deck primed with Elastocol Primer applied at ½ gal/100 ft^2
Vapor Retarder	0.045 in. thick SopraVap'r, self-adhered
Insulation[1]	Minimum 1.5 inch thick Flex ISO II ribbon adhered with Millennium One Step Foamable Adhesive, OlyBond 500 Adhesive Fastener, or Millennium PG 1 Pump Grade Adhesive applied in ½ in. wide beads 12 in. oc.
Insulation (Cover Board)	Min. ¼ in. thick Georgia-Pacific Gypsum LLC "DensDeck Prime® Roofboard", ribbon adhered in ½ in. wide beads 12 in. oc.
Membrane	Min. 0.045 in. thick Flex MFR PVC FB or Flex Tripolymer FB is fully adhered with TACC FA-636 adhesive applied at 1 gal/100 ft^2.
Tested Pressure (psf)	90
Allowable Wind Uplift Pressure (psf)4	-45
ASTM E108 External Fire Rating	Class A at maximum 1-$^{1}/_{2}$:12 incline

System No.	7
Deck	Structural concrete deck primed with Elastocol Primer applied at ½ gal/100 ft^2
Vapor Retarder	0.045 in. thick SopraVap'r, self-adhered
Insulation[1]	Minimum 1.5 inch thick Flex ISO II ribbon adhered with Millennium One Step Foamable Adhesive, OlyBond 500 Adhesive Fastener, or Millennium PG 1 Pump Grade Adhesive applied in ½ in. wide beads 12 in. oc.
Insulation (Cover Board)	Min. ¼ in. thick USG Securock® Gypsum-Fiber Roof Board, ribbon adhered with OlyBond 500 Adhesive Fastener, or Millennium PG 1 Pump Garde Adhesive applied in ½ in. wide beads 12 in. oc.
Membrane	Min. 0.045 in. thick Flex MFR PVC FB or Flex Tripolymer FB is fully adhered with TACC FA-636 adhesive applied at 1 gal/100 ft^2.
Tested Pressure (psf)	90
Allowable Wind Uplift Pressure (psf)4	-45
ASTM E108 External Fire Rating	Class A at maximum 1-1/2 :12 incline
System No.	8
Deck	Structural concrete deck primed with Elastocol Primer applied at ½ gal/100 ft^2
Vapor Retarder	0.045 in. thick SopraVap'r, self-adhered
Insulation[1]	Min. 2 in. thick STYROFOAM DECKMATE Plus FA ribbon adhered with Millennium One Step Foamable Adhesive, or OlyBond 500 Adhesive Fastener, or Millennium PG 1 Pump Grade Adhesive applied in ½ in. wide beads spaced maximum 12 in. oc.
Insulation (Cover Board)	Min. ¼ in. thick USG Securock® Gypsum-Fiber Roof Board, ribbon adhered with Millennium One Step Foamable Adhesive, OlyBond 500 Adhesive Fastener, or Millennium PG 1 Pump Garde Adhesive applied in ½ in. wide beads 12 in. oc.
Membrane	Min. 0.045 in. thick Flex Tripolymer MF/R or Flex Deck or min. 0.050 in. thick Flex MFR PVC is fully adhered with TACC LA-432-M or Ashland Pliobond 2375 Adhesive applied at 1 gal/120 ft^2.
Tested Pressure (psf)	150
Allowable Wind Uplift Pressure (psf)4	-75
ASTM E108 External Fire Rating	Class A at maximum 1/2 :12 incline
System No.	9
Deck	Structural concrete deck primed with Elastocol Primer applied at ½ gal/100 ft^2
Vapor Retarder	0.045 in. thick SopraVap'r, self-adhered
Insulation[1]	Min. 2 in. thick STYROFOAM DECKMATE Plus FA ribbon adhered with Millennium One Step Foamable Adhesive, or OlyBond 500 Adhesive Fastener, or Millennium PG 1 Pump Grade Adhesive applied in ½ in. wide beads spaced maximum 12 in. oc.
Insulation (Cover Board)	Min. ¼ in. thick USG Securock® Gypsum-Fiber Roof Board, ribbon adhered with Millennium One Step Foamable Adhesive, OlyBond 500 Adhesive Fastener, or Millennium PG 1 Pump Garde Adhesive applied in ½ in. wide beads 12 in. oc.
Membrane	Min. 0.045 in. thick Flex MFR PVC FB or Flex Tripolymer FB is fully adhered with TACC FA-636 adhesive applied at 1 gal/100 ft^2.
Tested Pressure (psf)	150
Allowable Wind Uplift Pressure (psf)4	-75
ASTM E108 External Fire Rating	Class A at maximum 1-1/2 :12 incline

System No.	10
Deck	Structural concrete deck with existing smooth or gravel surfaced BUR (loose gravel removed), or granule surfaced SBS modified bitumen roof
Insulation[1] (optional)	One or more layers min. 1.5 in. thick Insulfoam I ribbon adhered with Millennium One Step Foamable Adhesive, OlyBond 500 Adhesive, Millennium PG 1 Pump Grade Adhesive, ICP Adhesives CR-20, or Polyset Board-Max applied in ½ in. wide beads spaced maximum 12 in. oc.
Insulation (Cover Board)	Min. ¼ in. thick USG Securock® Gypsum-Fiber Roof Board, ribbon adhered with Millennium One Step Foamable Adhesive, OlyBond 500 Adhesive, Millennium PG 1 Pump Grade Adhesive, ICP Adhesives CR-20, or Polyset Board-Max applied in ½ in. wide beads spaced maximum 12 in. oc.
Membrane	Min. 0.045 in. thick Flex Tripolymer FB or Flex MFR PVC FB is adhered to the insulation with Flex Rubber Emulsion Adhesive applied at 1.67 gal/100 ft^2
Tested Pressure (psf)	475
Allowable Wind Uplift Pressure (psf)4	-237.5
ASTM E108 External Fire Rating	Class A at maximum $^1/_2$:12 incline
System No.	11
Deck	Structural concrete deck with existing smooth or gravel surfaced BUR (loose gravel removed),or granule surfaced SBS modified bitumen roof
Insulation[1] (optional)	One or more layers min. 1.5 in. thick Insulfoam I ribbon adhered with Millennium One Step Foamable Adhesive, OlyBond 500 Adhesive, Millennium PG 1 Pump Grade Adhesive, ICP Adhesives CR-20, or Polyset Board-Max applied in ½ in. wide beads spaced maximum 12 in. oc.
Insulation (Cover Board)	Min. ¼ in. thick USG Securock® Gypsum-Fiber Roof Board, ribbon adhered with Millennium One Step Foamable Adhesive, OlyBond 500 Adhesive, Millennium PG 1 Pump Grade Adhesive, ICP Adhesives CR-20, or Polyset Board-Max applied in ½ in. wide beads spaced maximum 12 in. oc.
Membrane	Min. 0.045 in. thick Flex Tripolymer MF/R or Flex Deck or 0.050 in. (1.3 mm) thick Flex MFR PVC is adhered to the insulation with TACC LA-432-M applied at 0.84 gal/100 ft^2 or Ashland Pliobond 2375 Adhesive applied at 1.67 gal/100 ft^2.
Tested Pressure (psf)	475
Allowable Wind Uplift Pressure (psf)4	-237.5
ASTM E108 External Fire Rating	Class A at maximum $^1/_2$:12 incline

System No.	12
Deck	Structural concrete deck with existing smooth or gravel surfaced BUR (loose gravel removed),or granule surfaced SBS modified bitumen roof
Insulation[1]	One or more layers min. 1.5 in. thick Flex ISO II ribbon adhered with Millennium One Step Foamable Adhesive applied in ½ in. wide beads spaced maximum 12 in. oc.
Membrane	Min. 0.045 in. thick Flex Tripolymer FB or Flex MFR PVC FB is adhered to the insulation with Flex Rubber Emulsion Adhesive applied at 1.67 gal/100 ft^2
Tested Pressure (psf)	390
Allowable Wind Uplift Pressure (psf)4	-195
ASTM E108 External Fire Rating	Class A at maximum $^1/_2$:12 incline

System No.	13
Deck	Structural concrete deck with existing smooth or gravel surfaced BUR (loose gravel removed),or granule surfaced SBS modified bitumen roof
Insulation[1]	One or more layers min. 1.5 in. thick Flex ISO II ribbon adhered with Millennium One Step Foamable Adhesive applied in ½ in. wide beads spaced maximum 12 in. oc.
Membrane[Φ]	Min. 0.045 in. thick Flex Tripolymer MF/R or Flex Deck or 0.050 in. (1.3 mm) thick Flex MFR PVC is adhered to the insulation with Ashland Pliobond 2375 Adhesive applied at 1.67 gal/100 ft^2.
Tested Pressure (psf)	390
Allowable Wind Uplift Pressure (psf)4	-195
UL 790 External Fire Rating	Class A at maximum $^1/_2$:12 incline

[Φ]Requires surfacing of river bottom stone (½ to ¾-in. diameter) at 1000-lb./100-$ft.^2$

System No.	14
Deck	Structural concrete deck with existing smooth or gravel surfaced BUR (loose gravel removed),or granule surfaced SBS modified bitumen roof
Insulation[1]	One or more layers min. 1.5 in. thick Flex ISO II ribbon adhered with Millennium PG 1 Pump Grade Adhesive, ICP Adhesives CR-20, or Polyset Board-Max applied in ½ in. wide beads spaced maximum 12 in. oc.
Membrane	Min. 0.045 in. thick Flex Tripolymer FB or Flex MFR PVC FB is adhered to the insulation with Flex Rubber Emulsion Adhesive applied at 1.67 gal/100 ft^2
Tested Pressure (psf)	315
Allowable Wind Uplift Pressure (psf)4	-157.5
ASTM E108 External Fire Rating	Class A at maximum $^1/_2$:12 incline

System No.	15
Deck	Structural concrete deck with existing smooth or gravel surfaced BUR (loose gravel removed),or granule surfaced SBS modified bitumen roof
Insulation[1]	One or more layers min. 1.5 in. thick Flex ISO II ribbon adhered with Millennium PG 1 Pump Grade Adhesive, ICP Adhesives CR-20, or Polyset Board-Max applied in ½ in. wide beads spaced maximum 12 in. oc.
Membrane[Φ]	Min. 0.045 in. thick Flex Tripolymer MF/R or Flex Deck or 0.050 in. (1.3 mm) thick Flex MFR PVC is adhered to the insulation with Ashland Pliobond 2375 Adhesive applied at 1.67 gal/100 ft^2.
Tested Pressure (psf)	315
Allowable Wind Uplift Pressure (psf)4	-157.5
UL 790 External Fire Rating	Class A at maximum $^1/_2$:12 incline

[Φ]Requires surfacing of river bottom stone (½ to ¾-in. diameter) at 1000-lb./100-$ft.^2$

System No.	16
Deck	Min. 22 gage steel deck, min. yield strength 33 ksi
Insulation[1]	Any of the following insulations, min. 1.5 in. “Flex ISO II”, “Flex ISO III”, Atlas Roofing “ACFoam II”, “ACFoam III”, Johns Manville “ENRGY 3”, or Rmax “Multi-Max 3”
Cover Board	Min. ¼ in. USG Co. “SECUROCK Fiber Roof Board”
Attachment[2]	Insulation and cover board attached to deck with OMG #12 Standard fasteners with 3 in. OMG 3 in. Galvalume Steel Plates at a contributory rate of 1 per sq. ft.
Base Sheet	0.080 in. thick SBS 80s/s Base adhered to cover board with Type III hot asphalt applied at 25 lbs./100 sq. ft.
Membrane	Min. 0.045 in. thick Tripolymer FB is adhered to the base sheet with Type III hot asphalt applied at 25 lbs./100 sq. ft. The laps are sealed with a 1.5 in. wide heat weld.
Tested Pressure (psf)	165
Allowable Wind Uplift Pressure (psf)[4]	-82.5
ASTM E108 External Fire Rating	Class A at maximum ½ in. incline

System No.	17
Deck	Min. 22 gage steel deck, min. yield strength 33 ksi
Insulation[1]	Any of the following insulations, min. 1.5 in. “Flex ISO II”, “Flex ISO III”, Atlas Roofing “ACFoam II”, “ACFoam III”, Johns Manville “ENRGY 3”, or Rmax “Multi-Max 3”
Cover Board[2]	Min. ½ in. Atlas Roofing “ACFoam-HS” secured to the insulation with OMG “OlyBond Fastening System” applied ¾ in. wide beads, 12 in. o.c..
Attachment[2]	Insulation and cover board attached to deck with OMG #12 Standard fasteners with 3 in. OMG 3 in. Galvalume Steel Plates at a contributory rate of 1 per sq. ft.
Membrane[2]	Min. 0.045 in. thick Tripolymer FB is adhered to the cover board with Flex FB Low Rise Adhesive applied at 60 sq. ft./gal. The laps are sealed with a 1.5 in. wide heat weld.
Tested Pressure (psf)	165
Allowable Wind Uplift Pressure (psf)[4]	-82.5
ASTM E108 External Fire Rating	Class A at maximum ½ in. incline

System No.	18
Deck	Min. 22 gage steel deck.
Insulation[1]	Any of the following insulations, min. 1.5 in. “Flex ISO II”, “Flex ISO III”, Atlas Roofing “ACFoam II”, “ACFoam III”, Johns Manville “ENRGY 3” or Rmax “Multi-Max 3”
Attachment[2]	Insulation attached to deck with OMG #12 Standard fasteners with 3 in. OMG 3 in. Galvalume Steel Plates at a contributory rate of 1 per sq. ft.
Membrane[2]	Min. 0.045 in. thick Flex MFR PVC FB is adhered to the insulation with Pliobond 7008 Water Based Adhesive applied at 100 sq. ft./gal. The laps are sealed with a 1.5 in. wide heat weld.
Tested Pressure (psf)	165
Allowable Wind Uplift Pressure (psf)[4]	82.5
Fire Rating in accordance with UL 790 (Roofing Systems (TGFU): Class A – Fully Adhered System No. 118	Class A at maximum 1 in. incline

System No.	19
Deck	Min. 22 gage steel deck.
Barrier Board	Min. ½ in. 4x4 ft Georgia-Pacific Gypsum LLC "DensDeck Prime® Roofboard" or USG Securock® Gypsum-Fiber Roof Board, mechanically fastened 1 per 4 sq. ft. with Dekfast DF #14-PH3-P3 fastener PLT-R-3 plates, or OMG Heavy Duty fastener with OMG 3 in. galvanized steel plate, or TruFast #14 HD fastener with TruFast 3" Metal Insulation Plate.
Primer	Elastocol Primer applied at ½ gal/100 ft^2
Vapor Retarder	0.045 in. thick SopraVap'r, self-adhered
Insulation	Min. 2 in. thick STYROFOAM DECKMATE Plus FA ribbon adhered with Millennium One Step Foamable Adhesive, or OlyBond 500 Adhesive Fastener, or Millennium PG 1 Pump Grade Adhesive applied in ½ in. wide beads spaced maximum 12 in. oc.
Insulation (Cover Board)	Min. ¼ in. thick Georgia-Pacific Gypsum LLC "DensDeck Prime® Roofboard", ribbon adhered with Millennium One Step Foamable Adhesive, or OlyBond 500 Adhesive Fastener, or Millennium PG 1 Pump Grade Adhesive applied in ½ in. wide beads spaced maximum 12 in. oc.
Membrane[2]	Min. 0.045 in. thick Flex Tripolymer MF/R or Flex Deck or 0.050 in. (1.3 mm) thick Flex MFR PVC is adhered to the insulation with TACC LA-432-M or Ashland Pliobond 2375 Adhesive applied at 1 gal/120 ft^2 The laps are sealed with a 1.5 in. wide heat weld.
Tested Pressure (psf)	90
Allowable Wind Uplift Pressure (psf)[4]	-45
Fire Rating in accordance with UL 790 (Roofing Systems (TGFU): Class A – Fully Adhered System No. 118	Class A at maximum ½ in. incline

System No.	20
Deck	Min. 22 gage steel deck.
Barrier Board	Min. ½ in. 4x4 ft Georgia-Pacific Gypsum LLC "DensDeck Prime® Roofboard" or USG Securock® Gypsum-Fiber Roof Board, mechanically fastened 1 per 4 sq. ft. with Dekfast DF #14-PH3-P3 fastener PLT-R-3 plates, or OMG Heavy Duty fastener with OMG 3 in. galvanized steel plate, or TruFast #14 HD fastener with TruFast 3" Metal Insulation Plate.
Primer	Elastocol Primer applied at ½ gal/100 ft^2
Vapor Retarder	0.045 in. thick SopraVap'r, self-adhered
Insulation	Min. 1.5 in. thick Flex ISO II, ribbon adhered with Millennium One Step Foamable Adhesive, or OlyBond 500 Adhesive Fastener, or Millennium PG 1 Pump Grade Adhesive applied in ½ in. wide beads spaced maximum 12 in. oc.
Insulation (Cover Board)	Min. ¼ in. thick Georgia-Pacific Gypsum LLC "DensDeck Prime® Roofboard", ribbon adhered with Millennium One Step Foamable Adhesive, or OlyBond 500 Adhesive Fastener, or Millennium PG 1 Pump Grade Adhesive applied in ½ in. wide beads spaced maximum 12 in. oc.
Membrane[2]	Min. 0.045 in. thick Flex Tripolymer FB or Flex MFR PVC FB is adhered to the insulation with TACC FA-636 adhesive applied at 1 gal/100 ft^2.
Tested Pressure (psf)	90
Allowable Wind Uplift Pressure (psf)[4]	-45
Fire Rating in accordance with UL 790 (Roofing Systems (TGFU): Class A – Fully Adhered System No. 118	Class A at maximum 1-½ in. incline

System No.	21
Deck	Min. 22 gage steel deck.
Barrier Board	Min. ½ in. 4x4 ft Georgia-Pacific Gypsum LLC "DensDeck Prime® Roofboard" or USG Securock® Gypsum-Fiber Roof Board, mechanically fastened 1 per 4 sq. ft. with Dekfast DF #14-PH3-P3 fastener PLT-R-3 plates, or OMG Heavy Duty fastener with OMG 3 in. galvanized steel plate, or TruFast #14 HD fastener with TruFast 3" Metal Insulation Plate.
Primer	Elastocol Primer applied at ½ gal/100 ft^2
Vapor Retarder	0.045 in. thick SopraVap'r, self-adhered
Insulation	Min. 1.5 in. thick Flex ISO II, ribbon adhered with Millennium One Step Foamable Adhesive, or OlyBond 500 Adhesive Fastener, or Millennium PG 1 Pump Grade Adhesive applied in ½ in. wide beads spaced maximum 12 in. oc.
Insulation (Cover Board)	Min. ¼ in. thick Georgia-Pacific Gypsum LLC "DensDeck Prime® Roofboard", ribbon adhered with Millennium One Step Foamable Adhesive, or OlyBond 500 Adhesive Fastener, or Millennium PG 1 Pump Grade Adhesive applied in ½ in. wide beads spaced maximum 12 in. oc.
Membrane[2]	Min. 0.045 in. thick Flex Tripolymer MF/R or Flex Deck or 0.050 in. (1.3 mm) thick Flex MFR PVC is adhered to the insulation with TACC LA-432-M or Ashland Pliobond 2375 Adhesive applied at 1 gal/120 ft^2 The laps are sealed with a 1.5 in. wide heat weld.
Tested Pressure (psf)	90
Allowable Wind Uplift Pressure (psf)[4]	-45
Fire Rating in accordance with UL 790 (Roofing Systems (TGFU): Class A – Fully Adhered System No. 118	Class A at maximum ½ in. incline

System No.	22
Deck	Min. 22 gage steel deck.
Barrier Board	Min. ½ in. 4x4 ft Georgia-Pacific Gypsum LLC "DensDeck Prime® Roofboard" or USG Securock® Gypsum-Fiber Roof Board, mechanically fastened 1 per 4 sq. ft. with Dekfast DF #14-PH3-P3 fastener PLT-R-3 plates, or OMG Heavy Duty fastener with OMG 3 in. galvanized steel plate, or TruFast #14 HD fastener with TruFast 3" Metal Insulation Plate.
Primer	Elastocol Primer applied at ½ gal/100 ft^2
Vapor Retarder	0.045 in. thick SopraVap'r, self-adhered
Insulation	Min. 1.5 in. thick Flex ISO II, ribbon adhered with Millennium One Step Foamable Adhesive, or OlyBond 500 Adhesive Fastener, or Millennium PG 1 Pump Grade Adhesive applied in ½ in. wide beads spaced maximum 12 in. oc.
Insulation (Cover Board)	Min. ¼ in. thick USG Securock® Gypsum-Fiber Roof Board, ribbon adhered with OlyBond 500 Adhesive Fastener, or Millennium PG 1 Pump Grade Adhesive applied in ½ in. wide beads spaced maximum 12 in. oc.
Membrane[2]	Min. 0.045 in. thick Flex Tripolymer MF/R or Flex Deck or 0.050 in. (1.3 mm) thick Flex MFR PVC is adhered to the insulation with TACC LA-432-M or Ashland Pliobond 2375 Adhesive applied at 1 gal/120 ft^2 The laps are sealed with a 1.5 in. wide heat weld.
Tested Pressure (psf)	90
Allowable Wind Uplift Pressure (psf)[4]	-45
Fire Rating in accordance with UL 790 (Roofing Systems (TGFU): Class A – Fully Adhered System No. 118	Class A at maximum ½ in. incline

System No.	23
Deck	Min. 22 gage steel deck, or structural concrete with existing smooth or gravel surfaced BUR (loose gravel removed),or granule surfaced SBS modified bitumen roof
Membrane[2]	Min. 0.045 in. thick Flex Tripolymer FB or Flex MFR PVC FB is adhered to the existing roof cover with Flex FB Low Rise Adhesive applied in ½ in. wide beads maximum 6 in. oc
Tested Pressure (psf)	120
Allowable Wind Uplift Pressure (psf)[4]	-60
ASTM E108 External Fire Rating	Class A at maximum ½:12 incline

System No.	24
Deck	Min $^{15}/_{32}$ in. APA rated CDX plywood, 24 in. spans with 8d ring shank nails 6 in. oc.
Insulation (Barrier board)	Any approved type or thickness, loose-laid, mechanically attached, or adhered with board joints offset min. 6 in. from joints in plywood deck.
Insulation	One or more layers, min. 1-½ in. thick Flex ISO II, mechanically fastened with FLEX HD 14 Fasteners and Flex 3" Galvalume Plates 1.6 ft^2 per fastener*.
Membrane	Min. 0.045 in. thick Flex MFR PVC FB or Flex Tripolymer FB is ribbon adhered to the insulation with Flex FB Low Rise Adhesive applied in ½ in. wide beads maximum 12 in. oc.
Tested Pressure (psf)	75
Allowable Wind Uplift Pressure (psf)[4]	-37.5
ASTM E108 External Fire Rating	Class A at maximum ½:12 incline

*Fastener pull resistance must yield minimum 120 lbf for re-roof or recover applications

System No.	25
Deck	Min $^{15}/_{32}$ in. APA rated CDX plywood, 24 in. spans with 8d ring shank nails 6 in. oc.
Insulation (Barrier board – Optional)	Any approved type or thickness, loose-laid, mechanically attached, or adhered with board joints offset min. 6 in. from joints in plywood deck.
Insulation	One or more layers, min. 1-½ in. thick Flex ISO II, mechanically fastened with FLEX HD 14 Fasteners and Flex 3" Galvalume Plates 1.6 ft^2 per fastener*.
Membrane	Min. 0.045 in. thick Flex Tripolymer FB or Flex MFR PVC FB is adhered to the insulation with Flex Rubber Emulsion Adhesive applied at 1.67 gal/100 ft^2
Tested Pressure (psf)	120
Allowable Wind Uplift Pressure (psf)[4]	-60
ASTM E108 External Fire Rating	Class A at maximum $^1/_2$:12 incline

*Fastener pull resistance must yield minimum 192 lbf for re-roof or recover applications

System No.	26
Deck	Min $^{15}/_{32}$ in. APA rated CDX plywood, 24 in. spans with 8d ring shank nails 6 in. oc.
Insulation (Barrier board – Optional)	Any approved type or thickness, loose-laid, mechanically attached, or adhered with board joints offset min. 6 in. from joints in plywood deck.
Insulation	One or more layers, min. 1-½ in. thick Flex ISO II, mechanically fastened with FLEX HD 14 Fasteners and Flex 3" Galvalume Plates 1.6 ft^2 per fastener*.
Membrane$^{\Phi}$	Min. 0.045 in. thick Flex Tripolymer MF/R or Flex Deck or 0.050 in. (1.3 mm) thick Flex MFR PVC is adhered to the insulation with Ashland Pliobond 2375 Adhesive applied at 1.67 gal/100 ft^2.
Tested Pressure (psf)	120
Allowable Wind Uplift Pressure (psf)[4]	-60
UL 790 External Fire Rating	Class A at maximum $^1/_2$:12 incline

*Fastener pull resistance must yield minimum 192 lbf for re-roof or recover applications

$^{\Phi}$Requires surfacing of river bottom stone (½ to ¾-in. diameter) at 1000-lb./100-ft.^{2}

System No.	27
Deck	Min $^{15}/_{32}$ in. APA rated CDX plywood, 24 in. spans with 8d ring shank nails 6 in. oc.
Insulation (Barrier board)	Any approved type or thickness, loose-laid, mechanically attached, or adhered with board joints offset min. 6 in. from joints in plywood deck.
Insulation	One or more layers, min. 1-½ in. thick Flex ISO II, mechanically fastened with FLEX HD 14 Fasteners and Flex 3" Galvalume Plates 1.78 ft^2 per fastener*.
Membrane	Min. 0.045 in. thick Flex Tripolymer FB or Flex MFR PVC FB is adhered to the insulation with Flex FB Low Rise Adhesive applied in ½ in. wide beads maximum 12 in. oc.
Tested Pressure (psf)	75
Allowable Wind Uplift Pressure (psf)[4]	-37.5
ASTM E108 External Fire Rating	Class A at maximum ½ in. incline

*Fastener pull resistance must yield minimum 134 lbf for re-roof or recover applications

System No.	28
Deck	Min $^{15}/_{32}$ in. APA rated CDX plywood, 24 in. spans with 8d ring shank nails 6 in. oc.
Insulation (Barrier board – Optional)	Any approved type or thickness, loose-laid, mechanically attached, or adhered with board joints offset min. 6 in. from joints in plywood deck.
Insulation	One or more layers, min. 1-½ in. thick Flex ISO II, loose laid.
Insulation (Cover Board)	Min. ¼ in. thick Georgia-Pacific Gypsum LLC "DensDeck Prime® Roofboard" or USG Co. "SECUROCK Fiber Roof Board" mechanically fastened with FLEX HD 14 Fasteners and Flex 3" Galvalume Plates 1.78 ft^2 per fastener*.
Membrane	Min. 0.045 in. thick Flex Tripolymer FB or Flex MFR PVC FB is adhered to the insulation with Flex Rubber Emulsion Adhesive applied at 1.67 gal/100 ft^2
Tested Pressure (psf)	90
Allowable Wind Uplift Pressure (psf)[4]	-45
UL 790 External Fire Rating	Class A at maximum ½:12 incline

*Fastener pull resistance must yield minimum 160 lbf for re-roof or recover applications

System No.	29
Deck	Min $^{15}/_{32}$ in. APA rated CDX plywood, 24 in. spans with 8d ring shank nails 6 in. oc.
Insulation (Barrier board – Optional)	Any approved type or thickness, loose-laid, mechanically attached, or adhered with board joints offset min. 6 in. from joints in plywood deck.
Insulation	One or more layers, min. 1-½ in. thick Flex ISO II, loose laid.
Insulation (Cover Board)	Min. ¼ in. thick Georgia-Pacific Gypsum LLC "DensDeck Prime® Roofboard" or USG Co. "SECUROCK Fiber Roof Board" mechanically fastened with FLEX HD 14 Fasteners and Flex 3" Galvalume Plates 1.78 ft^2 per fastener.
Membrane	Min. 0.045 in. thick Flex Tripolymer FB or Flex MFR PVC FB is adhered to the cover board with Ashland Pliobond 2375 Adhesive-applied at 1.67 gal/100 ft^2.
Tested Pressure (psf)	90
Allowable Wind Uplift Pressure (psf)[4]	-45
ASTM E108 External Fire Rating	Class A at maximum $^1/_2$:12 incline

System No.	30
Deck	Min. 22 gage steel deck, (min. Grade 40)
Insulation (Barrier board – Optional)	Any approved type or thickness, loose-laid.
Insulation	Min. 1-½ in. thick Flex ISO II mechanically fastened with OMG #12 Standard RoofGrip Fastener with OMG 3 in. Ribbed Galvalume Plate, 1 per 2 ft².
Insulation (Cover Board)	Min. ½ inch thick Georgia-Pacific Gypsum LLC "DensDeck Prime® Roofboard" or USG Co. “SECUROCK Fiber Roof Board” ribbon adhered with OlyBond 500 in continuous ribbons at 12-in. o.c.
Base Ply	Flex SBS 80 s/s Base Sheet adhered in Flex MOD-BIT Adhesive, 1½ to 2 gal. 100-ft².
Membrane	Min. 0.050 in. thick Flex KEE XT FB is adhered to the base ply with Polyset CR-20, spatter-applied, 3.75 lb/100 ft^2.
Tested Pressure (psf)	105
Allowable Wind Uplift Pressure (psf)[4]	-52.5
UL 790 External Fire Rating	Class A at maximum 2 :12 incline *TGFU.R9228 #120*

System No.	31
Deck	Structural concrete
Insulation	Elastizell Lightweight Insulating Concrete, target 300 psi (160 psi actual), cast at 39 to 41 pcf wet cast density, consisted of slurry coat, ⅛ to ¼-inch thick, followed by 1-inch thick, min. 1.0 pcf expanded polystyrene holey board set into wet slurry coat, and a 2-inch thick top coat. See Section 2 herein for LWC compressive data.
Membrane	Min. 0.050 in. thick Flex Tripolymer FB is adhered to the lightweight concrete with Flex FA636 PVC Water Borne Adhesive applied at 1 gal/100 ft^2.
Average Tested Pressure (psf)	1,165
Allowable Wind Uplift Pressure (psf)[4]	-413.75
UL 790 External Fire Rating	Class A at maximum 1 :12 incline *TGFU.R9228 #8*

System No.	32
Deck	Structural concrete
Insulation	Elastizell Lightweight Insulating Concrete, target 300 psi (160 psi actual), cast at 39 to 41 pcf wet cast density, consisted of slurry coat, ⅛ to ¼-inch thick, followed by 1-inch thick, min. 1.0 pcf expanded polystyrene holey board set into wet slurry coat, and a 2-inch thick top coat. See Section 2 herein for LWC compressive data.
Membrane	Min. 0.050 in. thick Flex MFR PVC FB is adhered to the lightweight concrete with OlyBond 500 Canister spatter applied at 3.58 lb/100 ft^2.
Average Tested Pressure (psf)	540
Allowable Wind Uplift Pressure (psf)[4]	-270
UL 790 External Fire Rating	Class A at maximum 1½ :12 incline *FMA PR451307*

Table 3
Fire and Wind Resistance Assemblies - Mechanically Fastened

System No.	1
Deck	Min. 22 gage steel deck, (min. Grade 80)
Insulation[1]	Any of the following insulations, min. 1.5 in. “Flex ISO II”, “Flex ISO III”, Atlas Roofing “ACFoam II”, “ACFoam III”, Johns Manville “ENRGY 3”, or Rmax “Multi-Max 3” is preliminary secured to the deck.
Membrane	Min. 0.045 in. thick and max. 120 in. wide Flex MFR PVC and Flex Tripolymer MF/R or Flex Deck secured to deck with OMG 2-⅜ in. XHD Barbed Stress Plate and the XHD Screw installed 6 in. o.c. in the 5-½ in. wide laps sealed with a 2 in. wide heat weld.
Tested Pressure (psf)	75
Allowable Wind Uplift Pressure (psf)[4]	-37.5
Fire Rating in accordance with UL 790 (Roofing Systems (TGFU): Class A - Mechanically Fastened (TPA, PVC) System No. 17)	Class A at maximum 1 in. incline with Flex Tripolymer MF/R or Flex Deck or Flex MFR PVC membranes

System No.	2
Deck	Min. 22 gage steel deck, (min. Grade 80)
Insulation[1]	Any of the following insulations, min. 1.5 in. “Flex ISO II”, “Flex ISO III”, Atlas Roofing “ACFoam II”, “ACFoam III”, Johns Manville “ENRGY 3”, or Rmax “Multi-Max 3” is preliminary secured to the deck.
Membrane	Min. 0.045 in. thick and max. 120 in. wide Flex MFR PVC and Flex Tripolymer MF/R or Flex Deck secured to deck with OMG 2-¾ in. Super XHD Barbed Stress Plate and the OMG Super XHD Screw installed 12 in. o.c. in the 6.0 wide laps sealed with a 2 in. wide heat weld.
Tested Pressure (psf)	75
Allowable Wind Uplift Pressure (psf)[4]	-37.5
Fire Rating in accordance with UL 790 (Roofing Systems (TGFU): Class A - Mechanically Fastened (TPA, PVC) System No. 17)	Class A at maximum 1 in. incline with Flex Tripolymer MF/R or Flex Deck or Flex MFR PVC membranes

System No.	3
Deck	Min. 22 gage steel deck, (min. Grade 80)
Insulation[1]	Any of the following insulations, min. 1.5 in. “Flex ISO II”, “Flex ISO III”, Atlas Roofing “ACFoam II”, “ACFoam III”, Johns Manville “ENRGY 3”, or Rmax “Multi-Max 3” is preliminary secured to the deck.
Membrane	Min. 0.045 in. thick and max. 81 in. wide Flex MFR PVC or Flex Tripolymer MF/R or Flex Deck secured to deck with OMG 2-⅜ in. XHD Barbed Stress Plate and the XHD Screw installed 6 in. o.c. in the 5-½ in. wide laps sealed with a 2 in. wide heat weld.
Tested Pressure (psf)	90
Allowable Wind Uplift Pressure (psf)[4]	-45
Fire Rating in accordance with UL 790 (Roofing Systems (TGFU): Class A - Mechanically Fastened (TPA, PVC) System No. 17)	Class A at maximum 1 in. incline with Flex Tripolymer MF/R or Flex Deck or Flex MFR PVC membranes

System No.	4
Deck	Min. 22 gage steel deck, (min. Grade 80)
Insulation[1]	Any of the following insulations, min. 1.5 in. “Flex ISO II”, “Flex ISO III”, Atlas Roofing “ACFoam II”, “ACFoam III”, Johns Manville “ENRGY 3”, or Rmax “Multi-Max 3” is preliminary secured to the deck.
Membrane	Min. 0.045 in. thick and max. 81 in. wide Flex MFR PVC and Flex Tripolymer MF/R or Flex Deck secured to deck with OMG 2-¾ in. Super XHD Barbed Stress Plate and the OMG Super XHD Screw installed 12 in. o.c. in the 5-¾ in. wide laps sealed with a 2 in. wide heat weld.
Tested Pressure (psf)	90
Allowable Wind Uplift Pressure (psf)[4]	-45
Fire Rating in accordance with UL 790 (Roofing Systems (TGFU): Class A - Mechanically Fastened (TPA, PVC) System No. 17)	Class A at maximum 1 in. incline with Flex Tripolymer MF/R or Flex Deck or Flex MFR PVC membranes

System No.	5
Deck	Min. 22 gage steel deck, (min. Grade 33)
Insulation[1]	Any of the following insulations, min. 1.5 in. “Flex ISO II”, “Flex ISO III”, Atlas Roofing “ACFoam II”, “ACFoam III”, Johns Manville “ENRGY 3”, or Rmax “Multi-Max 3” is secured to the deck with RhinoBond Insulation Plates and OMG Super XHD Screws at a contributory rate of 1 per 4 ft^2 in a 2 ft. x 2 ft. grid pattern.
Membrane	Min. 0.045 in. thick Flex MFR PVC and Flex Tripolymer MF/R or Flex Deck membranes are heat welded to the RhinoBond Insulation Plate bonding tool at 6 seconds per plate so the tool reaches 400° F. The laps sealed with a 2 in. wide heat weld.
Tested Pressure (psf)	120
Allowable Wind Uplift Pressure (psf)[4]	-60
Fire Rating in accordance with UL 790 (Roofing Systems (TGFU): Class A - Mechanically Fastened (TPA, PVC) System No. 17)	Class A at maximum 1 in. incline with Flex Tripolymer MF/R or Flex Deck or Flex MFR PVC membranes

System No.	6
Deck	Min. 22 gage steel deck, (min. Grade 33)
Insulation[1]	Any of the following insulations, min. 1.5 in. “Flex ISO II”, “Flex ISO III”, Atlas Roofing “ACFoam II”, “ACFoam III”, Johns Manville “ENRGY 3”, or Rmax “Multi-Max 3” is secured to the deck with RhinoBond Insulation Plates and OMG Super XHD Screws at a contributory rate of 1 per 6 ft^2 in a 2 ft. x 3 ft. grid pattern.
Membrane	Min. 0.045 in. thick Flex MFR PVC or Flex Tripolymer MF/R or Flex Deck membranes are heat welded to the RhinoBond Insulation Plate bonding tool at 6 seconds per plate so the tool reaches 400° F. The laps sealed with a 2 in. wide heat weld.
Tested Pressure (psf)	90
Allowable Wind Uplift Pressure (psf)[4]	-45
Fire Rating in accordance with UL 790 (Roofing Systems (TGFU): Class A - Mechanically Fastened (TPA, PVC) System No. 17)	Class A at maximum 1 in. incline with Flex Tripolymer MF/R or Flex Deck or Flex MFR PVC membranes

System No.	7
Deck	Min. 22 gage steel deck, (min. Grade 80)
Insulation[1]	Any of the following insulations, min. 1.5 in. “Flex ISO II”, “Flex ISO III”, Atlas Roofing “ACFoam II”, “ACFoam III”, Johns Manville “ENRGY 3”, or Rmax “Multi-Max 3” is preliminary secured to the deck.
Membrane	Min. 0.050 in. thick and max. 120 in. wide Flex MFR PVC or Flex Tripolymer MF/R or Flex Deck membranes mechanically attached 6.0 in. o.c. with rows spaced 115 in. with OMG 2-⅜ in. XHD Barbed Stress Plate and the OMG XHD fastener or Dekfast 1-1/2 in. x 2-¾ in. Oval Barbed Plate with Dekfast #15 HS. The laps sealed with a 1.5 in. wide heat weld.
Tested Pressure (psf)	90
Allowable Wind Uplift Pressure (psf)[4]	-45
Fire Rating in accordance with UL 790 (Roofing Systems (TGFU): Class A - Mechanically Fastened (TPA, PVC) System No. 17)	Class A at maximum 1 in. incline with Flex Tripolymer MF/R or Flex Deck or Flex MFR PVC membranes

System No.	8
Deck	Min $^{15}/_{32}$ in. Type B-C plywood, 24 in. spans with #8 wood screws 6 in. oc.
Insulation	Any of the following insulations, min. 1.5 in. “Flex ISO II”, “Flex ISO III”, Atlas Roofing “ACFoam II”, “ACFoam III”, Johns Manville “ENRGY 3”, or Rmax “Multi-Max 3”.
Insulation (Cover Board)	Min. ¼ in. thick Georgia-Pacific Gypsum LLC "DensDeck Prime® Roofboard" or USG Co. “SECUROCK Fiber Roof Board” mechanically fastened through the insulation to the deck with #14 Deckfast fasteners and isoweld PVC Plates or Flex Heavy Duty Fasteners with RhinoBond Plates at 1 per 2.67 ft²*
Membrane	Min. 0.060 in. thick Flex Tripolymer MF/R or Flex Deck or Flex MFR PVC membranes, induction welded.
Tested Pressure (psf)	45
Allowable Wind Uplift Pressure (psf)[4]	-22.5
UL 790 External Fire Rating	Class A at maximum 2 in. incline

*Pull resistance of top insulation layer fasteners must yield minimum 120 lbf for re-roof or recover applications

System No.	9
Deck	Min $^{15}/_{32}$ in. Type B-C plywood, 24 in. spans with #8 wood screws 6 in. oc.
Insulation	Any of the following insulations, min. 0.5 in. “Flex ISO II”, “Flex ISO III”, Atlas Roofing “ACFoam II”, “ACFoam III”, Johns Manville “ENRGY 3”, or Rmax “Multi-Max 3”.
Insulation (Cover Board)	Min. ¼ in. thick Georgia-Pacific Gypsum LLC "DensDeck Prime® Roofboard" or USG Co. “SECUROCK Fiber Roof Board” mechanically fastened through the insulation to the deck with (4) #14 Deckfast screws or Flex HD 14 Fasteners and Deckfast 3” Round Plates per 4x8 ft board.
Membrane	Min. 0.060 in. thick Flex Tripolymer MF/R or Flex Deck or Flex MFR PVC membranes, mechanically fastened* with Flex HD 14 Fasteners or Dekfast #14 screws with Deckfast Galvalume Steel Round 2-⅜” Barbed Plates 6 in. oc in the 5 in. wide sidelaps spaced 76 in. oc. Laps are sealed with a 1.5 in heat weld.
Tested Pressure (psf)	45
Allowable Wind Uplift Pressure (psf)[4]	-22.5
UL 790 External Fire Rating	Class A at maximum 2 in. incline

*Fastener pull resistance must yield minimum 143 lbf for re-roof or recover applications

System No.	10
Deck	Min $^{15}/_{32}$ in. Type B-C plywood, 24 in. spans with #8 wood screws 6 in. oc.
Insulation (Barrier board – Optional)	Any approved type or thickness, loose-laid, mechanically attached, or adhered with board joints offset min. 6 in. from joints in plywood deck.
Insulation	One or more layers of Flex ISO II. Top layer to be min. 1.5 in.
Insulation (Cover Board)	Min. ¼ in. thick Georgia-Pacific Gypsum LLC "DensDeck Prime® Roofboard" or USG Co. “SECUROCK Fiber Roof Board”. Top insulation layer or coverboard to be preliminarily fastened with Flex HD 14 Fasteners and Flex 3” galvalume Plates at 8 ft^2 per fastener.
Membrane	Min. 0.050 in. thick Flex MFR PVC membrane, mechanically fastened* with Flex HD 14 Fasteners or Dekfast #15 HS screws with Deckfast Galvalume Steel Round 2-⅜” Barbed Plates max. 6 in. oc in the 5 in. wide sidelaps spaced max. 75 in. oc. Laps are sealed with a 1.5 in heat weld.
Tested Pressure (psf)	105
Allowable Wind Uplift Pressure (psf)[4]	-52.5
UL 790 External Fire Rating	Class A at maximum 2 in. incline

*Fastener pull resistance must yield minimum 328 lbf for re-roof or recover applications

System No.	11
Deck	Min $^{15}/_{32}$ in. Type B-C plywood, 24 in. spans with #8 wood screws 6 in. oc.
Insulation (Barrier board – Optional)	Any approved type or thickness, loose-laid, mechanically attached, or adhered with board joints offset min. 6 in. from joints in plywood deck.
Insulation	One or more layers of Flex ISO II. Top layer to be min. 1.5 in.
Insulation (Cover Board)	Min. ¼ in. thick Georgia-Pacific Gypsum LLC "DensDeck Prime® Roofboard" or USG Co. “SECUROCK Fiber Roof Board”. Top insulation layer or coverboard to be preliminarily fastened with Flex HD 14 Fasteners and Flex 3” galvalume Plates at 8 ft^2 per fastener.
Membrane	Min. 0.050 in. thick Flex MFR PVC membrane, mechanically fastened* with Flex HD 14 Fasteners or Dekfast #15 HS screws with Deckfast Galvalume Steel Round 2-⅜” Barbed Plates max. 6 in. oc in the 5 in. wide sidelaps spaced max. 55 in. oc. Laps are sealed with a 1.5 in heat weld.
Tested Pressure (psf)	165
Allowable Wind Uplift Pressure (psf)[4]	-82.5
UL 790 External Fire Rating	Class A at maximum 2 in. incline

System No.	12
Deck	Min. 22 gage steel deck, (min. Grade 80)
Insulation	Min. 1-½ in. thick Flex ISO II Preliminarily attached with OMG Standard RoofGrip Fastener (#12) with OMG 3” Ribbed Galvalume Plate, 5 per 4x8 board and OMG XHD Fasteners with RhinoBond Insulation Plates (PVC), 12-in. o.c. in rows 60-in. o.c
Membrane	Min. 0.050 in. thick Flex KEE XT membrane are heat welded to the RhinoBond Insulation Plate bonding tool at 6 seconds per plate so the tool reaches 400° F. The laps sealed with a 2 in. wide heat weld.
Tested Pressure (psf)	90
Allowable Wind Uplift Pressure (psf)[4]	-45
UL 790 External Fire Rating	Class A at maximum 1 in. incline

System No.	13
Deck	Min $^{15}/_{32}$ in. APA rated CDX plywood, 24 in. spans and blocked 48-inch o.c. mechanically fastened with 8d ring shank nails 6 in. oc.
Insulation	Min. ¼ in. thick Georgia-Pacific Gypsum LLC "DensDeck and OMG #14 Heavy Duty Fastener with RhinoBond Insulation Plate (PVC), 36-inch o.c. into the wood supports, 24-inch (36x24-inch)
Membrane	Min. 0.060 in. thick Flex Tripolymer MF/R membrane are heat welded to the RhinoBond Insulation Plate bonding tool at 6 seconds per plate so the tool reaches 400° F. The laps sealed with a 2 in. wide heat weld.
Tested Pressure (psf)	105
Allowable Wind Uplift Pressure (psf)[4]	-52.5
UL 790 External Fire Rating	Class A at maximum 2 in. incline

System No.	14
Deck	Min $^{15}/_{32}$ in. APA rated CDX plywood, 24 in. spans and blocked 48-inch o.c. mechanically fastened with 8d ring shank nails 6 in. oc.
Insulation	Min. ¼ in. thick Georgia-Pacific Gypsum LLC "DensDeck and OMG #14 Heavy Duty Fastener with RhinoBond Insulation Plate (PVC), 18-inch o.c. into the wood supports, 24-inch (36x24-inch)
Membrane	Min. 0.060 in. thick Flex Tripolymer MF/R membrane are heat welded to the RhinoBond Insulation Plate bonding tool at 6 seconds per plate so the tool reaches 400° F. The laps sealed with a 2 in. wide heat weld.
Tested Pressure (psf)	210
Allowable Wind Uplift Pressure (psf)[4]	-105.0
UL 790 External Fire Rating	Class A at maximum 2 in. incline

System No.	15
Deck	Min $^{15}/_{32}$ in. APA rated CDX plywood, 24 in. spans and blocked 48-inch o.c. mechanically fastened with 8d ring shank nails 6 in. oc.
Insulation	Min. ¼ in. thick Georgia-Pacific Gypsum LLC "DensDeck and OMG #14 Heavy Duty Fastener with RhinoBond Insulation Plate (PVC), 9-inch o.c. into the wood supports, 24-inch (36x24-inch)
Membrane	Min. 0.060 in. thick Flex Tripolymer MF/R membrane are heat welded to the RhinoBond Insulation Plate bonding tool at 6 seconds per plate so the tool reaches 400° F. The laps sealed with a 2 in. wide heat weld.
Tested Pressure (psf)	285
Allowable Wind Uplift Pressure (psf)[4]	-142.5
UL 790 External Fire Rating	Class A at maximum 2 in. incline

***Fastener pull resistance must yield minimum 378 lbf for re-roof or recover applications

Notes:

[1]All foam plastic insulation shall be UL Classified for Roofing Systems, and shall be limited to the maximum thickness in accordance with Section 5.2 of this report or maximum thickness in accordance with this table, whichever is less.

[2]Adhesives shall be UL Classified and fasteners FM-Approved.

[3]Fasteners row spaces shown are field of roof only. See Section 8.1 for recognized fascia system for mechanically fastened roof assemblies. Distance between the edge of the roof and the first row of fasteners shall be determined accordingly.

[4]The allowable wind uplift pressure is based the Acceptance Criteria for Membrane Roof-Covering Systems (AC75),Section 3.1.1. A safety factor of 2 was applied to the maximum test load achieved without failure.

UL Solutions Evaluation Reports

UL Solutions Headquarters
333 Pfingsten Road
Northbrook, IL 60062-2096 USA
T: 847.272.8800
UL.com/Solutions