



BUILDING CODE COMPLIANCE OFFICE (BCCO)
PRODUCT CONTROL DIVISION

MIAMI-DADE COUNTY, FLORIDA
METRO-DADE FLAGLER BUILDING
140 WEST FLAGLER STREET, SUITE 1603
MIAMI, FLORIDA 33130-1563
(305) 375-2901 FAX (305) 375-2908

NOTICE OF ACCEPTANCE (NOA)

The Garland Company, Inc.
3800 East 91st Street
Cleveland, OH 44105-2197

SCOPE:

This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed by the BCCO and accepted by the Building Code and Product Review Committee to be used in Miami Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).

This NOA shall not be valid after the expiration date stated below. The BCCO (In Miami Dade County) and/or the AHJ (in areas other than Miami Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. BCCO reserves the right to revoke this acceptance, if it is determined by BCCO that this product or material fails to meet the requirements of the applicable building code.

This product is approved as described herein, and has been designed to comply with the Florida Building Code and the High Velocity Hurricane Zone of the Florida Building Code.

DESCRIPTION: Garland Modified Bitumen Roof System Over Steel Deck

RENEWAL of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.

TERMINATION of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.

ADVERTISEMENT: The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.

INSPECTION: A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This NOA revises NOA 06-1018.02 and consists of pages 1 through 41.
The submitted documentation was reviewed by Jorge L. Acebo



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ROOFING ASSEMBLY NOTICE OF ACCEPTANCE

Category: Roofing
Sub-Category: Modified Bitumen

Material: SBS/SIS/SEBS
Deck Type: Steel
Maximum Design Pressure -150 psf
Fire Classification: See General Limitation #1

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

<u>Product</u>	<u>Dimensions</u>	<u>Test Specification</u>	<u>Product Description</u>
HPR Tri-Base Plus HPR Tri-Base Premium	36" x 72'	proprietary	Double asphalt coated, polyester/fiberglass/polyester scrim reinforced base sheet
HPR Glasbase	36" x 108'	ASTM D 4601, Type II	Type II, asphalt coated fiberglass base sheet.
HPR Premium Glasbase	36" x 72'	ASTM D 4601, Type II	Type II, asphalt coated fiberglass base sheet.
HPR Torch Base Sheet	39" x 34'8"	ASTM D 5147	SBS modified, fiberglass reinforced, torch applied base sheet.
HPR Glasfelt	36" x 180'	ASTM D 2178, Type IV	Type IV asphalt impregnated glass felt for use in conventional and modified bitumen built-up system.
HPR Premium Glasfelt	36" x 180'	ASTM D 2178, Type VI	Type VI asphalt impregnated glass felt for use in conventional and modified bitumen built-up systems.
HPR Polyscrim Plus	40" x 324'	ASTM D 5726	Polyester felt for use in conventional and modified bitumen built-up roof systems.
BK Glasfelt	36" x 180'	ASTM D 4990, Type I	Coal Tar impregnated glass felt for use in conventional and modified bitumen built-up system.
BK Premium Glasfelt	36" x 180'	ASTM D 4990, Type I	Coal Tar impregnated glass felt for use in conventional and modified bitumen built-up systems.
GarMesh	6" x 150' 12" x 150'	ASTM D 1668	SBR coated woven fiberglass reinforcing membrane.
Grip Polyester Firm	10 squares	ASTM D 1682	Polyester reinforcing fabric for use in cold applied systems.
Grip Polyester Soft	10 squares	ASTM D 1682	Polyester reinforcing fabric, for use in cold applied systems.
HPR Organic Base Sheet	36" x 72'	ASTM D 2626	Asphalt coated organic base sheet.



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<u>Product</u>	<u>Dimensions</u>	<u>Test Specification</u>	<u>Product Description</u>
StressPly	39" x 34'8"	ASTM D 6163 Grade S	Smooth surfaced , SBS modified, fiberglass scrim reinforced roofing membrane.
StressPly Mineral	39" x 26'2"	ASTM D 6163 Grade G	Mineral surfaced, SBS modified, fiberglass scrim reinforced membrane.
StressPly FR Mineral	39" x 26'2"	ASTM D 6163 Grade G	Mineral surfaced, SBS modified, fire retardant, fiberglass scrim membrane.
StressPly Plus	39" x 34'8"	ASTM D 6163, Grade S	Smooth surfaced, SBS modified, Quad-Axial fiberglass scrim membrane.
StressPly Plus FR Mineral	39" x 26'2"	ASTM D 6163, Grade G	Mineral surfaced, SBS modified, fire retardant, UV resistant, Quad-Axial fiberglass scrim membrane.
StressPly E	39" x 34'8"	ASTM D 6162, Grade S	Smooth surfaced, SBS/SIS modified, fiberglass/polyester reinforced membrane.
StressPly E Mineral	39" x 26'2"	ASTM D 6162, Grade G	Mineral surfaced, SBS/SIS modified, fiberglass/polyester reinforced membrane.
StressPly E FR Mineral	39" x 26'2"	ASTM D 6162, Grade G	Mineral surfaced, SBS/SIS modified, fire retardant, fiberglass/polyester reinforced membrane.
VersiPly 60	39" x 34'8"	ASTM D 6163, Grade S	Smooth surfaced, SBS modified, fiberglass scrim reinforced roofing membrane.
VersiPly 80	39" x 34'8"	ASTM D 6163, Grade S	Smooth surfaced, SBS modified, fiberglass scrim reinforced roofing membrane.
VersiPly Mineral	39" x 26'2"	ASTM D 6163, Grade G	Mineral surfaced, SBS modified, fiberglass scrim reinforced roofing membrane.
StressPly IV	39" x 26'2"	ASTM D 6163, Grade S	Smooth surfaced, SBS modified, fiberglass reinforced, torch applied cap sheet.
StressPly IV Mineral	39" x 26'2"	ASTM D 6163, Grade G	Mineral surfaced, SBS modified, fiberglass reinforced, torch applied cap sheet.
StressPly IV UV Mineral	39" x 26'2"	ASTM D 6163, Grade G	Mineral surfaced, SBS modified, fiberglass reinforced, torch applied cap sheet.
StressPly EUV Mineral	39" x 26'2"	ASTM D 6162, Grade G	Mineral surfaced, SBS/SIS modified, fiberglass/polyester reinforced membrane.
StressPly EUV FR Mineral	39" x 26'2"	ASTM D 6162, Grade G	Mineral surfaced, SBS/SIS modified, fiberglass/polyester reinforced membrane.
StressPly EUV	39" x 34'8"	ASTM D 6162, Grade S	Smooth surfaced, SBS/SIS modified, fiberglass/polyester reinforced membrane.
Millennium Base Sheet	39" x 51'5"	ASTM D 5147	Smooth surfaced, SBS modified coal tar, fiberglass/polyester reinforced base sheet.
Millennium	39" x 34'5"	ASTM D 5147	Smooth surfaced, SBS modified coal tar, fiberglass/polyester reinforced membrane.
Millennium Mineral	39" x 26'	ASTM D 5147	Mineral surfaced, SBS modified coal tar, fiberglass/polyester reinforced membrane.
Millennium FR Mineral	39" x 26'	ASTM D 5147	Mineral surfaced, SBS modified coal tar, fiberglass/polyester reinforced membrane.
Millennium Walkway Pads	30" x 25"		Polymer modified coal tar walking pads.



<u>Product</u>	<u>Dimensions</u>	<u>Test Specification</u>	<u>Product Description</u>
Flashing Bond, Ultra-Shield Flashing Cement, Ultra-Shield Plastic Roof Cement, Silver-Flash, Weatherking Flashing Adhesive	5 gallon	ASTM D 4586	Trowel grade, asphalt based roofing mastic for use in repair and patching against leaks in built-up asphalt roofs.
Black Knight Mastic	5 gallon		Trowel grade tar based roofing mastic for use in repair and patching.
Garla-Flex, Ultra-Shield Rubberized Cement	2, 5 gallon pail	ASTM D 4586	Elastomeric, asphaltic compound formulated from a special weather and ozone-resistant thermoplastic rubber, plasticizing oils and bitumen. Asbestos free.
Garla-Shield, Ultra-Shield Fibered Emulsion	5, 55 gallon	ASTM D 1227, Type IV	Asphalt emulsion roof coating.
Weatherking or Weatherking Plus WC	5, 55 gallon	ASTM D 3019, Type III	Cold process roof coating and adhesive.
Ultra-Shield Metal Rust Proofing	5, 55 gallon	ASTM D 3019, Type III	Asbestos-free, petroleum compound modified with polymers and corrosion inhibitors.
Ultra-Shield Built-Up Mastic FR, Weather Screen	5, 55 gallon	ASTM D 4479, Type I	Asbestos-free, heavy-bodied, fiber-reinforced, fire-rated asphalt roof coating.
Garla-Brite	5 gallon	ASTM D 2824, Type I	Aluminum roof coating.
Energizer K Plus FR or Energizer FR	5, 55 gallon	ASTM D 4479, Type I	Multipurpose, rubberized, liquid waterproofing membrane.
Garla-Prime, Garla-Prime WB, Ultra-Shield Primer	5, 55 gallon	ASTM D 41	Non-fibered, quick drying asphalt roof primer.
Black-Knight Primer			Quick drying coal tar roof primer
Silver-Shield	5, 55 gallon	ASTM D 2824, Type III	High solis, aluminized roof coating.
Pyramic	5, 55 gallon		White acrylic reflective roof coating.
White-Knight	5, 55 gallon		White urethane reflective roof coating.
Garlastic KM or Garlastic KM Plus	60 lb. keg	TAS 121	SEBS modified, hot applied asphalt.
HPR All Temp Asphalt	100 lb. keg	TAS 121	Hot asphalt adhesive for modified bitumen and BUR roof systems.
BlackKnight or Black-Knight LV Flood Coat	70 lb. keg	Proprietary	Polymer modified coal tar pitch.
Black-Knight CTP	200 lb. keg		
Black Knight Cold	5, 55 gallon		Polymer modified coal tar pitch.
Insu-lock II	3 gallon	Proprietary	Polyurethane low rise insulation adhesive



APPROVED INSULATIONS:

TABLE 2

Product Name	Product Description	Manufacturer (With Current NOA)
Apache Pyrox, Apache White Line, Apache Pyrox PSI-25, Apache White Line PSI-25	Polyisocyanurate foam insulation	Apache Products Company
Apache Millox, Apache Millox-P	Composite polyisocyanurate insulation	Apache Products Company
ACFoam II, ACFoam III	Polyisocyanurate foam insulation	Atlas Energy Products
ACFoam Composite	Composite polyisocyanurate insulation board	Atlas Energy Products
Hytherm AP	Polyisocyanurate foam insulation	Dow
Hytherm Composite	Composite polyisocyanurate insulation	Dow
ISO 95+, ISO 95+ (25psi), ISO 95+GL	Polyisocyanurate foam insulation	Firestone
ISO 95+ Composite	Composite polyisocyanurate insulation board	Firestone
Extruded or Expanded Polystyrene	Polystyrene Insulation	generic
Gypsum	Gypsum board	generic
High Density Wood Fiberboard	Wood fiber insulation board	generic
Perlite Insulation	Perlite insulation board	generic
DensDeck, DensDeck Prime, DensDeck Fireguard, DensDeck Prime Fireguard, DensDeck DuraGuard	Water resistant gypsum board	G-P Gypsum Corp.
H-Shield	Polyisocyanurate foam insulation	Hunter Panels, Inc.
H-Shield CG	Polyisocyanurate foam insulation	Hunter Panels, Inc.
H-Shield-P, H-Shield-WF	Composite Insulation board	Hunter Panels, Inc.
ENRGY-2	Polyisocyanurate foam insulation	Johns Manville
ENRGY-2 Plus, Composite, Fesco Foam	Composite Insulation board	Johns Manville
ENRGY-3	Polyisocyanurate foam insulation	Johns Manville
ENRGY-3 Plus	Composite Insulation board	Johns Manville
Multi-Max FA	Polyisocyanurate foam insulation	RMax
Thermarroof Composite	Composite Insulation board	RMax
UltraMax	Polyisocyanurate foam insulation	RMax
Multi-Max FA-3	Polyisocyanurate foam insulation	RMax
Thermarroof Composite-3	Composite insulation board	RMax
SECUROCK®	Gypsum board	US Gypsum



APPROVED FASTENERS:

TABLE 3

Fastener Number	Product Name	Product Description	Dimensions	Manufacturer (With Current NOA)
1.	Dekfast Fasteners #12, #14 & #15	Insulation fastener for wood, steel and concrete decks		Construction Fasteners Inc.
2.	Omega Fastener	Insulation fastener for wood and steel		Construction Fasteners Inc.
3.	Dekfast Hex Plate	Galvalume hex stress plate.	2 7/8" x 3 1/4"	Construction Fasteners Inc.
4.	Dekfast Lock Plate	Polypropylene locking plate.	3" x 3 1/4"	Construction Fasteners Inc.
5.	#12 Roofgrip Fasteners	Insulation fastener for wood and steel.		ITW Buildex Corp.
6.	Metal Plate	Galvalume stress plate.	3" round 3" square	ITW Buildex Corp.
7.	Gearlok Plastic Plate	Polypropylene round plate	3.2"	ITW Buildex Corp.
8.	Olympic Fastener #12 & #14	Insulation fastener		Olympic Manufacturing Group, Inc.
9.	Olympic Fastener ASAP	Pre-assembled Insulation fastener and plate		Olympic Manufacturing Group, Inc.
10.	Olympic Polypropylene	Polypropylene plastic plate	3.25" round	Olympic Manufacturing Group, Inc.
11.	Olympic G-2	3.5" round galvalume AZ55 steel plate	3.5" round	Olympic Manufacturing Group, Inc.
12.	Olympic Standard	3" round galvalume AZ50 steel plate	3" round	Olympic Manufacturing Group, Inc.
13.	Insul-Fixx Fastener	Insulation fastener for steel and wood decks		SFS Stadler, Inc.
14.	System ES-1	Pre-assembled Insulation fastener and plate		SFS Stadler, Inc.
15.	Insul-Fixx S Plate	3" round galvalume AZ50 steel plate	3" round	SFS Stadler, Inc.
16.	Insul-Fixx P Plate	3" round polyethylene stress plate	3" round	SFS Stadler, Inc.
17.	Tru-Fast Fastener	Insulation fastener for steel and wood decks		The Tru-Fast Corp.
18.	Tru-Fast Plates	3" round galvalume AZ55 steel plate	3" round	The Tru-Fast Corp.
19.	Tru-Fast Plates	Polyethylene plastic plate	3" round	The Tru-Fast Corp.
20.	Tru-Fast HD Fastener	Insulation fastener for steel and wood decks		The Tru-Fast Corp.
21.	Olympic HD Fastener	Insulation fastener for wood, steel and concrete.		OMG, Inc.



EVIDENCE SUBMITTED:

<u>Test Agency</u>	<u>Test Identifier</u>	<u>Description</u>	<u>Date</u>
Dynatech Engineering Corporation	#4530.05.95-1	Wind Uplift Classification	5/31/95
Factory Mutual Research Corporation	J.I. IVOA7.AM	FM 4470	02/21/95
	J.I. 1B4A7.AM	FM 4470	12/15/97
	J.I. 4B4A9.AM	FM 4470	12/31/97
	J.I. 0Y5A6.AM	FM 4470	09/08/97
	J.I. 3D3A5.AM	FM 4470	09/15/98
	J.I. 3004392	FM 4470	09/21/99
	3000637	FM 4470	4/26/00
	J.I. 0D9A0.AM	FM 4470	05/02/00
	J.I. 3004907	FM 4470	05/16/00
	J.I. 3009117	FM 4470	12/21/00
	3010113	FM 4470	11/18/02
	3019046	FM 4470	03/04/05
	3021718	FM 4470	04/11/05
Trinity Engineering, Inc.	#4532.12.95-1	Wind Uplift Classification (6" x 6" Adhesion Testing)	12/31/95
PRI Asphalt Technologies, Inc.	GRD-03-02-01	Physical Properties ASTM D 5147	01/07/98
	GRD-05-02-01		12/18/97
	GRD-06-02-01		01/09/98
Exterior Research & Design, LLC. TRINITY ERD	TX21G5A		04/25/06
	#4533.05.98-1	PA 114(J)	05/15/98
	4544.11.06	TAS 114	11/02/06



APPROVED ASSEMBLIES:

Deck Type 2I: Steel, Insulated

Deck Description: 18-22 ga. steel

System Type B(1): Base layer of insulation mechanically fastened, top layer adhered with approved asphalt or adhesive.

All General and System Limitations apply.

<u>Base Insulation Layer</u>	<u>Insulation Fasteners</u> <u>(Table 3)</u>	<u>Fastener</u> <u>Density/ft²</u>
Pyrox, WhiteLine, Millox, ACFoam II, Isotherm R, E'NRG'Y-2, PSI-25, UltraGard, ISO-95+GL Minimum 1.5" thick	1, 5, 8, 13, 14 & 17	1:2 ft ²
ConPerl, GAFTEMP Permalite, Fesco Board Minimum 1.5" thick	1, 5, 8, 13, 14 & 17	1:2 ft ²

Note: Base layer shall be mechanically attached with fasteners and density described. Insulation panels listed are minimum sizes and dimensions; if larger panels are used the number of fasteners per board shall be increased maintaining the same fastener density (See Roofing Application Standard RAS I17 for fastening details).

<u>Middle Insulation Layer (Optional)</u>	<u>Insulation Fasteners</u> <u>(Table 3)</u>	<u>Fastener</u> <u>Density/ft²</u>
UltraGard, Pyrox, E'NRG'Y-2, ENRGY 3, PSI-25, WhiteLine, Millox, ACFoam II, Isotherm R, UltraGard, ISO-95+GL Minimum 1.5" thick	N/A	N/A

<u>Top Insulation Layer (Optional)</u>	<u>Insulation Fasteners</u> <u>(Table 3)</u>	<u>Fastener</u> <u>Density/ft²</u>
BP High Strength, FM-90 Traffic Top/High Density, GAFTEMP High Density, Roof Insulation Board, High Density Fiberboard, Fiber Base HD1, HD6, Structodek Minimum ½" thick	N/A	N/A
DensDeck, DensDeck Prime Minimum ¼" thick	N/A	N/A

Note: Apply optional middle and/or top layer of insulation shall be adhered with approved hot asphalt within the EVT range and at a rate of 20-40 lbs/100 ft² or in Insta-Stik Roofing Adhesive applied in continuous ¾ to 1 inch wide beads spaced 12" o.c. Please refer to Roofing Application Standard RAS 117 for insulation attachment. Insulations listed as the base layer shall only be used as the base layer with a second layer of approved top layer insulation installed as the final membrane substrate. Composite insulation panels may be used as a top layer placed with the polyisocyanurate side face down.



Base/Ply Sheet: One or more plies of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base Premium, HPR Glasfelt, HPR Premium Glasfelt, HPR Polyscrim Plus, or other Approved ASTM D 2178, type IV or VI ply sheet or other approved ASTM D 4601 Type II base sheet adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs./sq. (Note: Minimum two plies of ASTM D 2178, type VI or three plies of type IV is required for VersiPly 60 applications.)

Membrane: One ply of StressPly E, StressPly E Mineral, StressPly E FR Mineral, StressPly, StressPly Mineral, StressPly FR Mineral, StressPly Plus, StressPly Plus FR Mineral, StressPly EUV, StressPly EUV Mineral, StressPly EUV FR Mineral, VersiPly 60, VersiPly 80, or VersiPly Mineral adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs./sq.

Surfacing: Optional for FR or mineral surfaced Membranes. Required for non-FR or smooth surfaced membranes. Apply one of the below or any approved coatings:

1. 400 lb./sq. gravel or 300 lb./sq. slag in a flood coat of approved mopping asphalt at an application rate of 60 lb./sq. or in BlackKnight Flood Coat or Black-Knight LV Flood Coat at 70 lb./sq. or BlackKnight Cold or BlackKnight WB at 5 gal/sq. (asphalt applied systems only, Not compatible with Weatherking and Weatherking Plus WC applied systems)
2. Minimum two coats of Garla-Brite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
3. Energizer FR applied at 3 gal./sq. or Energizer K Plus FR applied at 3.5 gal/sq with minimum two coats of Garla-Brite applied at min 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
4. WeatherScreen applied at min. 4 gal./sq. with minimum two coats of GarlaBrite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat .
5. WeatherScreen applied at min. 4 gal./sq. with #11 roofing granules at 60 lb./sq.
6. WeatherScreen applied at applied at min. 4 gal./sq. with roofing gravel applied at 400 lb./sq.

Maximum Design Pressure: -45 psf. (See General Limitation #9.)



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Deck Type 2I: Steel, Insulated

Deck Description: 18-22 ga. steel

System Type B(2): Base layer of insulation mechanically fastened, top layer adhered with approved asphalt.

Deck: 18-22 ga Grade C steel deck attached 6' o.c. (every flute) using 3/4"puddle welds to steel supports spaced maximum 5 ft. o.c.

All General and System Limitations apply.

<u>Base Insulation Layer</u>	<u>Insulation Fasteners (Table 3)</u>	<u>Fastener Density/ft²</u>
ACFoam II Minimum 1.5" thick	8	1:1.33 ft ²

Note: Base layer shall be mechanically attached with fasteners and density described. Insulation panels listed are minimum sizes and dimensions; if larger panels are used the number of fasteners per board shall be increased maintaining the same fastener density (See Roofing Application Standard RAS 117 for fastening details).

<u>Middle Insulation Layer (Optional)</u>	<u>Insulation Fasteners (Table 3)</u>	<u>Fastener Density/ft²</u>
ACFoam II Minimum 1.5" thick	N/A	N/A

<u>Top Insulation Layer (Optional)</u>	<u>Insulation Fasteners (Table 3)</u>	<u>Fastener Density/ft²</u>
High Density Fiberboard, Structodek Minimum 1/2" thick	N/A	N/A
DensDeck, DensDeck Prime Minimum 1/4" thick	N/A	N/A

Note: Apply optional middle and/or top layer of insulation shall be adhered with approved hot asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs/100 ft². Please refer to Roofing Application Standard RAS 117 for insulation attachment. Insulations listed as the base layer shall only be used as the base layer with a second layer of approved top layer insulation installed as the final membrane substrate. Composite insulation panels may be used as a top layer placed with the polyisocyanurate side face down.

Base/Ply Sheet: One or more plies of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base Premium, HPR Glasfelt, HPR Premium Glasfelt, HPR Polyscrim Plus, or other Approved ASTM D 2178, type IV or VI ply sheet or other approved ASTM D 4601 Type II base sheet adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs./sq. (Note: Minimum two plies of ASTM D 2178, type VI or three plies of type IV is required for VersiPly 60 applications.)



Membrane: One ply of StressPly E, StressPly E Mineral, StressPly E FR Mineral, StressPly, StressPly Mineral, StressPly FR Mineral, StressPly Plus, StressPly Plus FR Mineral, StressPly EUV, StressPly EUV Mineral, StressPly EUV FR Mineral, VersiPly 60, VersiPly 80, or VersiPly Mineral adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs./sq.

Surfacing: Optional for FR or mineral surfaced Membranes. Required for non-FR or smooth surfaced membranes. Apply one of the below or any approved coatings:

1. 400 lb./sq. gravel or 300 lb./sq. slag in a flood coat of approved mopping asphalt at an application rate of 60 lb./sq. or in BlackKnight Flood Coat or Black-Knight LV Flood Coat at 70 lb./sq. or BlackKnight Cold or BlackKnight WB at 5 gal/sq. (asphalt applied systems only, Not compatible with Weatherking and Weatherking Plus WC applied systems)
2. Minimum two coats of Garla-Brite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
3. Energizer FR applied at 3 gal./sq. or Energizer K Plus FR applied at 3.5 gal/sq with minimum two coats of Garla-Brite applied at min 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
4. WeatherScreen applied at min. 4 gal./sq. with minimum two coats of GarlaBrite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat .
5. WeatherScreen applied at min. 4 gal./sq. with #11 roofing granules at 60 lb./sq.
6. WeatherScreen applied at applied at min. 4 gal./sq. with roofing gravel applied at 400 lb./sq.

Maximum Design Pressure: -82.5 psf. (See General Limitation #7.)



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Deck Type 2I: Steel, Insulated

Deck Description: 18-22 ga. steel

System Type B(3): Base layer of insulation mechanically fastened, top layer adhered with approved asphalt.

Deck: 18-22 ga Grade C steel deck attached 6' o.c. (every flute) using ¼" puddle welds to steel supports spaced maximum 5 ft. o.c.

All General and System Limitations apply.

<u>Base Insulation Layer</u>	<u>Insulation Fasteners (Table 3)</u>	<u>Fastener Density/ft²</u>
ACFoam II Minimum 1.5" thick	8	1:1.33 ft ²

Note: Base layer shall be mechanically attached with fasteners and density described. Insulation panels listed are minimum sizes and dimensions; if larger panels are used the number of fasteners per board shall be increased maintaining the same fastener density (See Roofing Application Standard RAS 117 for fastening details).

<u>Middle Insulation Layer (Optional)</u>	<u>Insulation Fasteners (Table 3)</u>	<u>Fastener Density/ft²</u>
ACFoam II Minimum 1.5" thick	N/A	N/A

<u>Top Insulation Layer (Optional)</u>	<u>Insulation Fasteners (Table 3)</u>	<u>Fastener Density/ft²</u>
High Density Fiberboard, Structodek Minimum ½" thick	N/A	N/A
DensDeck, DensDeck Prime Minimum ¼" thick	N/A	N/A

Note: Apply optional middle and/or top layer of insulation shall be adhered with approved hot asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs/100 ft² or in Insta-Stik Roofing Adhesive applied in continuous ¾ to 1 inch wide beads spaced 12" o.c. Please refer to Roofing Application Standard RAS 117 for insulation attachment. Insulations listed as the base layer shall only be used as the base layer with a second layer of approved top layer insulation installed as the final membrane substrate. Composite insulation panels may be used as a top layer placed with the polyisocyanurate side face down.

Base/Ply Sheet: One more plies of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base Premium, HPR Glasfelt, HPR Premium Glasfelt or other Approved ASTM D 2178, type IV or VI ply sheet or other approved ASTM D 4601 Type II base sheet adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs./sq.
Or
One ply of HPR Torch Base Sheet, torch applied to coverboard.



Membrane: One ply of StressPly IV, StressPly IV UV Mineral or StressPly IV Mineral, torch applied.

Surfacing: Optional for Stress Ply IV Mineral or StressPly IV UV Mineral. Required for StressPly IV. Apply one of the below or any approved coating.

1. Minimum two coats of Garla-Brite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
2. 400 lb./sq. gravel or 300 lb./sq. slag in a flood coat of approved mopping asphalt at an application rate of 60 lb./sq. or in BlackKnight Flood Coat or BlackKnight LV Flood Coat at 70 lb./sq. or BlackKnight Cold or BlackKnight WB at 5 gal/sq.

Maximum Design Pressure: -82.5 psf. (See General Limitation #7.)



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Deck Type 2I: Steel, Insulated

Deck Description: Min. 18-22 ga. steel

System Type B(4): Base layer of insulation mechanically fastened, top layer adhered with approved adhesive.

All General and System Limitations apply.

Base Insulation Layer

Any approved non-foil faced polyisocyanurate insulation
Minimum 1.5" thick

Insulation Fasteners
(Table 2)

Fastener
Density/ft²

Any fastener from Table 2 1:2.67 ft²

Note: Base layer shall be mechanically attached with fasteners and density described. Insulation panels listed are minimum sizes and dimensions; if larger panels are used the number of fasteners per board shall be increased maintaining the same fastener density (See Roofing Application Standard RAS 117 for fastening details).

Middle Insulation Layer

(Optional) Any approved non-foil faced polyisocyanurate insulation
Minimum 1.5" thick

Insulation Fasteners
(Table 2)

Fastener
Density/ft²

N/A N/A

Top Insulation Layer

High Density Wood Fiber
Minimum ½" thick

Insulation Fasteners
(Table 2)

Fastener
Density/ft²

N/A N/A

Perlite
Minimum ½" thick

N/A N/A

DensDeck, DensDeck Prime
Minimum ½" thick

N/A N/A

Note: Apply optional middle and/or top layer of insulation shall be adhered with Insul-Lock II applied in ¾"- 1" wide ribbons spaced 12" o.c. Please refer to Roofing Application Standard RAS 117 for insulation attachment. Insulations listed as the base layer shall only be used as the base layer with a second layer of approved top layer insulation installed as the final membrane substrate. Composite insulation panels may be used as a top layer placed with the polyisocyanurate side face down.

Base/Ply Sheet: One or more plies of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base Premium, HPR Glasfelt, HPR Premium Glasfelt, HPR Polyscrim Plus, or other Approved ASTM D 2178, type IV or VI ply sheet or other approved ASTM D 4601 Type II base sheet adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs./sq. (Note: Minimum two plies of ASTM D 2178, type VI or three plies of type IV is required for VersiPly 60 applications.)



Membrane:

One ply of StressPly E, StressPly E Mineral, StressPly E FR Mineral, StressPly, StressPly Mineral, StressPly FR Mineral, StressPly Plus, StressPly Plus FR Mineral, VersiPly 60, VersiPly 80 or VersiPly Mineral, StressPly EUV, StressPly EUV Mineral, StressPly EUV FR Mineral adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs./sq.

Surfacing:

Optional for FR or mineral surfaced Membranes. Required for non-FR or smooth surfaced membranes. Apply one of the below or any approved coatings:

1. 400 lb./sq. gravel or 300 lb./sq. slag in a flood coat of approved mopping asphalt at an application rate of 60 lb./sq. or in BlackKnight Flood Coat or Black-Knight LV Flood Coat at 70 lb/sq. or BlackKnight Cold or BlackKnight WB at 5 gal/sq. (asphalt applied systems only, Not compatible with Weatherking and Weatherking Plus WC applied systems)
2. Minimum two coats of Garla-Brite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
3. Energizer FR applied at 3 gal./sq. or Energizer K Plus FR applied at 3.5 gal/sq with minimum two coats of Garla-Brite applied at min 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
4. WeatherScreen applied at min. 4 gal./sq. with minimum two coats of GarlaBrite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat .
5. WeatherScreen applied at min. 4 gal./sq. with #11 roofing granules at 60 lb./sq.
6. WeatherScreen applied at applied at min. 4 gal./sq. with roofing gravel applied at 400 lb./sq.

Maximum Design Pressure:

-45.0 psf. (See General Limitation #9.)



Deck Type 2I: Steel, Insulated
Deck Description: Min. 18-22 ga. steel
System Type B(5): Base layer of insulation mechanically fastened, top layer adhered with approved asphalt.

All General and System Limitations apply.

<u>Base Insulation Layer</u>	<u>Insulation Fasteners</u> (Table 3)	<u>Fastener</u> <u>Density/ft²</u>
ACFoam II, ACFoam III, Isotherm R, E'NRG'Y 2, ENRGY 3, PSI 25, HyTherm AP, HyTherm SP, UltraGard, ISO 95+GL, HyTherm Composite Minimum 1.8" thick	Any fastener from Table 3	1:3 ft ²

Note: Base layer shall be mechanically attached with fasteners and density described. Insulation panels listed are minimum sizes and dimensions; if larger panels are used the number of fasteners per board shall be increased maintaining the same fastener density (See Roofing Application Standard RAS 117 for fastening details).

<u>Top Insulation Layer</u>	<u>Insulation Fasteners</u> (Table 3)	<u>Fastener</u> <u>Density/ft²</u>
High Density Wood Fiber Minimum ½" thick	N/A	N/A
Perlite Minimum ¾" thick	N/A	N/A
DensDeck, DensDeck Prime Minimum ¼" thick	N/A	N/A

Note: Top layer of insulation shall be adhered with approved hot asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs/100 ft². Please refer to Roofing Application Standard RAS 117 for insulation attachment. Insulations listed as the base layer shall only be used as the base layer with a second layer of approved top layer insulation installed as the final membrane substrate. Composite insulation panels may be used as a top layer placed with the polyisocyanurate side face down.

Base/Ply Sheet: Minimum Two plies of HPR Polyscrim Plus
 Or
 Minimum Two plies of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base Premium or other approved ASTM D 4601 Type II base sheet adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs./sq.

Membrane: One ply of HPR Polyscrim Plus adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs./sq.

Surfacing: 1. 400 lb./sq. gravel or 300 lb./sq. slag in a flood coat of approved mopping asphalt at an application rate of 40 lb./sq. or in BlackKnight Flood Coat or BlackKnight LV Flood Coat at 70 lb/sq.

Maximum Design Pressure: -45.0 psf. (See General Limitation #9.)



Deck Type 2I: Steel, Insulated
Deck Description: 18-22 ga. steel Type B Grade 33 steel deck attached with Traxx/5 fasteners 6" o.c. (every flute) to steel supports spaced 6' o.c.
System Type B(6): Base layer of insulation mechanically fastened, top layer adhered with approved asphalt or adhesive.

All General and System Limitations apply.

<u>Base Insulation Layer</u>	<u>Insulation Fasteners</u> (Table 3)	<u>Fastener Density/ft²</u>
ACFoam II, ENRGY 3, H-Shield Minimum 2.0" thick	1 & 3 or 6, 12 & 21, 18 & 20	1:1 ft ²

Note: Base layer shall be mechanically attached with fasteners and density described. Insulation panels listed are minimum sizes and dimensions; if larger panels are used the number of fasteners per board shall be increased maintaining the same fastener density (See Roofing Application Standard RAS 117 for fastening details).

<u>Top Insulation Layer</u>	<u>Insulation Fasteners</u> (Table 3)	<u>Fastener Density/ft²</u>
DensDeck Prime Minimum ½" thick	N/A	N/A

Note: Top layer of insulation shall be adhered in full mopping of approved hot asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 25 lbs/100 ft² or with Insul-Lock II or Weathertite Pourable Foam Insulation Adhesive applied in ¾"- 1" wide ribbons spaced 6" o.c. Please refer to Roofing Application Standard RAS 117 for insulation attachment. Insulations listed as the base layer shall only be used as the base layer with a second layer of approved top layer insulation installed as the final membrane substrate. Composite insulation panels may be used as a top layer placed with the polyisocyanurate side face down.

Base/Ply Sheet: One or more plies of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base Premium, HPR Glasfelt, HPR Premium Glasfelt or other approved ASTM D 2178 Type IV or VI ply sheet or other approved ASTM D 4601 Type II base sheet adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 25 lbs./sq. (Note: Minimum two plies of ASTM D 2178, type VI or three plies of type IV is required for VersiPly 60 applications.)

Or

One ply of HPR Torch Base Sheet, torch applied to coverboard



Membrane:

One ply of StressPly E, StressPly E Mineral, StressPly E FR Mineral, StressPly, StressPly Mineral, StressPly FR Mineral, StressPly Plus, StressPly Plus FR Mineral, StressPly EUV, StressPly EUV Mineral, StressPly EUV FR Mineral, VersiPly 60, VersiPly 80, VersiPly Mineral, StressPly EUV, StressPly EUV Mineral, StressPly EUV FR Mineral adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 25 lbs./sq.

Or

One ply of StressPly IV, StressPly IV UV Mineral or StressPly IV Mineral, torch applied.

Surfacing:

Optional for FR or mineral surfaced Membranes. Required for non-FR or smooth surfaced membranes. Apply one of the below or any approved coatings:

1. 400 lb./sq. gravel or 300 lb./sq. slag in a flood coat of approved mopping asphalt at an application rate of 60 lb./sq. or in BlackKnight Flood Coat or Black-Knight LV Flood Coat at 70 lb/sq. or BlackKnight Cold or BlackKnight WB at 5 gal/sq. (asphalt applied systems only, Not compatible with Weatherking and Weatherking Plus WC applied systems)
2. Minimum two coats of Garla-Brite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
3. Energizer FR applied at 3 gal./sq. or Energizer K Plus FR applied at 3.5 gal/sq with minimum two coats of Garla-Brite applied at min 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
4. WeatherScreen applied at min. 4 gal./sq. with minimum two coats of GarlaBrite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat .
5. WeatherScreen applied at min. 4 gal./sq. with #11 roofing granules at 60 lb./sq.
6. WeatherScreen applied at applied at min. 4 gal./sq. with roofing gravel, applied at 400 lb./sq.

Maximum Design Pressure:

-112.5 psf (See General Limitation #7)



- Deck Type 2I:** Steel, Insulated
- Deck Description:** 18-22 ga. steel Type B Grade 33 steel deck attached with Traxx/5 fasteners 6" o.c. (every flute) to steel supports spaced 6' o.c.
- System Type B(7):** Base layer of insulation mechanically fastened, top layer adhered with approved asphalt.

All General and System Limitations apply.

<u>Base Insulation Layer</u>	<u>Insulation Fasteners</u> <u>(Table 3)</u>	<u>Fastener</u> <u>Density/ft²</u>
ACFoam II, ENRGY 3, H-Shield Minimum 2.0" thick	1 & 3 or 6, 12 & 21, 18 & 20	1:1 ft ²

Note: Base layer shall be mechanically attached with fasteners and density described. Insulation panels listed are minimum sizes and dimensions; if larger panels are used the number of fasteners per board shall be increased maintaining the same fastener density (See Roofing Application Standard RAS 117 for fastening details).

<u>Top Insulation Layer</u>	<u>Insulation Fasteners</u> <u>(Table 3)</u>	<u>Fastener</u> <u>Density/ft²</u>
DensDeck Prime Minimum ½" thick	N/A	N/A

Note: Top layer of insulation shall be adhered in full mopping of approved hot asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 25 lbs/100 ft². Please refer to Roofing Application Standard RAS 117 for insulation attachment. Insulations listed as the base layer shall only be used as the base layer with a second layer of approved top layer insulation installed as the final membrane substrate. Composite insulation panels may be used as a top layer placed with the polyisocyanurate side face down.

Base/Ply Sheet: One or more plies of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base Premium, HPR Glasfelt, HPR Premium Glasfelt or other approved ASTM D 2178 Type IV or VI ply sheet or other approved ASTM D 4601 Type II base sheet adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 25 lbs./sq. (Note: Minimum two plies of ASTM D 2178, type VI or three plies of type IV is required for VersiPly 60 applications.)

Membrane: One ply of StressPly E, StressPly E Mineral, StressPly E FR Mineral, StressPly, StressPly Mineral, StressPly FR Mineral, StressPly Plus, StressPly Plus FR Mineral, StressPly EUV, StressPly EUV Mineral, StressPly EUV FR Mineral, VersiPly 60, VersiPly 80, or VersiPly Mineral adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 25 lbs./sq.



Surfacing:

Optional for FR or mineral surfaced Membranes. Required for non-FR or smooth surfaced membranes. Apply one of the below or any approved coatings:

1. 400 lb./sq. gravel or 300 lb./sq. slag in a flood coat of approved mopping asphalt at an application rate of 60 lb./sq. or in BlackKnight Flood Coat or Black-Knight LV Flood Coat at 70 lb./sq. or BlackKnight Cold or BlackKnight WB at 5 gal./sq. (asphalt applied systems only, Not compatible with Weatherking and Weatherking Plus WC applied systems)
2. Minimum two coats of Garla-Brite applied at min. 0.5 gal./sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal./sq/coat.
3. Energizer FR applied at 3 gal./sq. or Energizer K Plus FR applied at 3.5 gal./sq with minimum two coats of Garla-Brite applied at min 0.5 gal./sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal./sq/coat.
4. WeatherScreen applied at min. 4 gal./sq. with minimum two coats of GarlaBrite applied at min. 0.5 gal./sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal./sq/coat .
5. WeatherScreen applied at min. 4 gal./sq. with #11 roofing granules at 60 lb./sq.
6. WeatherScreen applied at applied at min. 4 gal./sq. with roofing gravel applied at 400 lb./sq.

Maximum Design Pressure:

-142.5 psf (See General Limitation #7)



Deck Type 2I: Steel, Insulated
Deck Description: 18-22 ga. steel
System Type B(8): Base layer of insulation mechanically fastened, optional top layer adhered with approved asphalt.

All General and System Limitations apply.

<u>Base Insulation Layer</u>	<u>Insulation Fasteners (Table 2)</u>	<u>Fastener Density/ft²</u>
DensDeck, DensDeck Prime, DensDeck Duragard Minimum 5/8" thick	10	1:4 ft ²

Note: Base layer shall be mechanically attached with fasteners and density described. Insulation panels listed are minimum sizes and dimensions; if larger panels are used the number of fasteners per board shall be increased maintaining the same fastener density (See Roofing Application Standard RAS 117 for fastening details).

Vapor Barrier: Two ply ASTM D2178 Type IV or Type VI ply sheet, adhered in full mopping of approved asphalt at 25 lb/sq.

<u>Top Insulation Layer</u>	<u>Insulation Fasteners (Table 2)</u>	<u>Fastener Density/ft²</u>
ACFoam II, Hy-Therm AP, ENRGY 3, H-Sheild, Multi-Max FA Minimum 1.5" thick	N/A	N/A
High Density Wood Fiberboard Maximum 1" thick	N/A	N/A

Note: Apply top layer of insulation shall be adhered with approved hot asphalt within the EVT range and at a rate of 20-40 lbs/100 ft² or in 1/2" – 3/4" wide beads of Insta-Stik spaced 12" o.c. Please refer to Roofing Application Standard RAS 117 for insulation attachment. Insulations listed as the base layer shall only be used as the base layer with a second layer of approved top layer insulation installed as the final membrane substrate.

System 1: **Base/Ply Sheet:** Two to four plies BK Glasfelt, BK Premium Glasfelt or HPR Polyscrim Plus, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq.
Cap Sheet: One ply of Millennium, Millennium Mineral or Millennium FR Mineral, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq.

System 2: **Base Sheet:** One ply HPR Organic Base, HPR Glasbase, HPR Premium Glasbase, adhered in full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus at a rate of 25 lbs/sq.
 Or
 One ply Millennium Base, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq.
Ply Sheet: Two to three plies BK Glasfelt, BK Premium Glasfelt, HPR Polyscrim, or HPR Polyscrim Plus, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq.
Cap Sheet: One ply of Millennium, Millennium Mineral or Millennium FR Mineral, adhered in full mopping of Black Knight or approved Type I or Type III Coal



- Tar Pitch at a rate of 30 lbs/sq.
- System 3: Base Sheet:** One ply HPR Organic Base, HPR Glasbase, HPR Premium Glasbase, adhered in full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus at a rate of 25 lbs/sq.
- Or
- One ply Millennium Base, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq. or adhered in Black Knight Cold applied at 1.5-2 gal/sq.
- Ply Sheet:** One ply Millennium Base, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq.
- Or
- One ply Millennium Base adhered in Black Knight Cold applied at 1.5-2 gal/sq. (to base layer of Millennium Base only)
- Cap Sheet:** One ply of Millennium, Millennium Mineral or Millennium FR Mineral, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq.
- Or
- One ply of Millennium, Millennium Mineral or Millennium FR Mineral adhered in Black Knight Cold applied at 1.5-2 gal/sq. (to Millennium Base only)
- System 4: Base Sheet:** One ply Millennium Base, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq. or adhered in Black Knight Cold applied at 1.5-2 gal/sq.
- Ply Sheet:** One ply Millennium, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq. or adhered in Black Knight Cold applied at 1.5-2 gal/sq.
- Cap Sheet:** One ply of Millennium, Millennium Mineral or Millennium FR Mineral, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq. or adhered in Black Knight Cold applied at 1.5-2 gal/sq.
- System 5: Base/Ply Sheet:** Three to five plies BK Glasfelt, BK Premium Glasfelt or HPR Polyscrim Plus, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq.
- System 6: Base/Ply Sheet:** One ply HPR Organic Base, HPR Glasbase, HPR Premium Glasbase, adhered in full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus at a rate of 25 lbs/sq.
- Or
- One ply Millennium Base, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq. or adhered in Black Knight Cold applied at 1.5-2 gal/sq.
- Cap Sheet:** Two to four plies BK Glasfelt, BK Premium Glasfelt or HPR Polyscrim Plus, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq.



Surfacing:

(Required if no mineral cap sheet is used) Install one of the following:

1. 400 lb./sq. gravel or 300 lb./sq. slag in a flood coat of approved mopping asphalt at an application rate of 60 lb./sq. or in Black Knight Flood Coat or Black Knight LV Flood Coat at 70 lb./sq. or Black Knight Cold or Black Knight WB at 5 gal/sq.
2. Minimum two coats of GarlaBrite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.

Maximum Design Pressure: -45.0 psf (See General Limitation # 9)



Deck Type 2I: Steel, Insulated

Deck Description: 18-22 ga. steel

System Type B(9): Base layer of insulation mechanically fastened, optional top layer adhered with approved asphalt.

All General and System Limitations apply.

<u>Base Insulation Layer</u>	<u>Insulation Fasteners (Table 2)</u>	<u>Fastener Density/ft²</u>
Hy-Therma AP, ENRGY 3, PSI-25, H-Shield Minimum 1.5" thick	1, 4, 10, 11, 17, 20	1:4 ft ²
ENRGY 3, PSI-25 Minimum 1.5" thick	1, 4, 10, 11, 17, 20	1:2 ft ²
ACFoam Composite/PB, GAFTEMP Permalite Minimum 1.5" thick	1, 4, 10, 11, 17, 20	1:4 ft ²
Structodek Minimum 0.5" thick	1, 4, 10, 11, 17, 20	1:4 ft ²
Fesco Minimum 0.75" thick	1, 4, 10, 11, 17, 20	1:2 ft ²
Fiberglas Standard, Fiberglas Wide Flute Minimum 0.5" thick	1, 4, 10, 11, 17, 20	1:2 ft ²

Note: Base layer shall be mechanically attached with fasteners and density described. Insulation panels listed are minimum sizes and dimensions; if larger panels are used the number of fasteners per board shall be increased maintaining the same fastener density (See Roofing Application Standard RAS 117 for fastening details).

<u>Top Insulation Layer</u>	<u>Insulation Fasteners (Table 2)</u>	<u>Fastener Density/ft²</u>
Armor Board High Density Fiberboard, GAFTEMP High Density Fiberboard, Roof Insulating Board, Fiber Base HD1, HD6 Minimum 0.5" thick	N/A	N/A
Structodek, Armor Board Fiberboard Minimum 1.0" thick	N/A	N/A
GAFTEMP Premalite Recover Board, Insul-Roof, Permagrip, Retro-Fit Minimum 0.5" thick	N/A	N/A
Armor Lite, GAFTEMP Permalite, Fesco Minimum 0.75" thick	N/A	N/A
DensDeck, DensDeck Prime Minimum 0.25" thick	N/A	N/A



Note: Apply top layer of insulation shall be adhered with approved hot asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs/100 ft² or Type I or Type III Coal Tar at a rate of 30 lbs/100 ft². Please refer to Roofing Application Standard RAS 117 for insulation attachment. Insulations listed as the base layer shall only be used as the base layer with a second layer of approved top layer insulation installed as the final membrane substrate.

- System 1:** **Base/Ply Sheet:** Two to four plies BK Glasfelt, BK Premium Glasfelt or HPR Polyscrim Plus, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq.
- Cap Sheet:** One ply of Millennium, Millennium Mineral or Millennium FR Mineral, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq.
- System 2:** **Base Sheet:** One ply HPR Organic Base, HPR Glasbase, HPR Premium Glasbase, adhered in full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus at a rate of 25 lbs/sq.
- Or
- One ply Millennium Base, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq.
- Ply Sheet:** Two to three plies BK Glasfelt, BK Premium Glasfelt or HPR Polyscrim Plus, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq.
- Cap Sheet:** One ply of Millennium, Millennium Mineral or Millennium FR Mineral, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq.
- System 3:** **Base Sheet:** One ply HPR Organic Base, HPR Glasbase, HPR Premium Glasbase, adhered in full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus at a rate of 25 lbs/sq.
- Or
- One ply Millennium Base, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq. or adhered in Black Knight Cold applied at 1.5-2 gal/sq.
- Ply Sheet:** One ply Millennium Base, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq.
- or
- One ply Millennium Base adhered in Black Knight Cold applied at 1.5-2 gal/sq. (to base layer of Millennium Base only)
- Cap Sheet:** One ply of Millennium, Millennium Mineral or Millennium FR Mineral, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq.
- or
- One ply of Millennium, Millennium Mineral or Millennium FR Mineral adhered in Black Knight Cold applied at 1.5-2 gal/sq. (to Millennium Base only)
- System 4:** **Base Sheet:** One ply Millennium Base, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq. or adhered in Black Knight Cold applied at 1.5-2 gal/sq.
- Ply Sheet:** One ply Millennium, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq. or adhered in Black Knight



Cold applied at 1.5-2 gal/sq.

Cap Sheet: One ply of Millennium, Millennium Mineral or Millennium FR Mineral, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq. or adhered in Black Knight Cold applied at 1.5-2 gal/sq.

System 5: Base/Ply Sheet: Three to five plies BK Glasfelt, BK Premium Glasfelt or HPR Polyscrim Plus, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq.

System 6: Base/Ply Sheet: One ply HPR Organic Base, HPR Glasbase, HPR Premium Glasbase, adhered in full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus at a rate of 25 lbs/sq.

Or

One ply Millennium Base, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq. or adhered in Black Knight Cold applied at 1.5-2 gal/sq.

Cap Sheet: Two to four plies BK Glasfelt, BK Premium Glasfelt or HPR Polyscrim Plus, adhered in full mopping of Black Knight or approved Type I or Type III Coal Tar Pitch at a rate of 30 lbs/sq.

Surfacing: (Required if no mineral cap sheet is used) Install one of the following:

1. 400 lb./sq. gravel or 300 lb./sq. slag in a flood coat of approved mopping asphalt at an application rate of 60 lb./sq. or in Black Knight Flood Coat or Black Knight LV Flood Coat at 70 lb/sq. or Black Knight Cold or Black Knight WB at 5 gal/sq.
2. Minimum two coats of GarlaBrite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat

Maximum Design Pressure: -45.0 psf (See General Limitation # 9)



Deck Type 2I: Steel, Insulated

Deck Description: 18-22 ga. steel

System Type C(1): All layers of insulation simultaneously attached.

Deck: 18-22 ga Grade C steel deck attached 6' o.c. (every flute) using ¾"puddle welds to steel supports spaced 5 ft. o.c.

All General and System Limitations apply.

<u>Base Insulation Layer</u>	<u>Insulation Fasteners</u> (Table 3)	<u>Fastener</u> <u>Density/ft²</u>
Pyrox, WhiteLine, Millox, ACFoam II, Isotherm R, E'NRG'Y-2, PSI-25, UltraGard, ISO-95+GL Minimum 1" thick	N/A	N/A

Note: All layers shall be simultaneously fastened; see top layer below for fasteners and density.

<u>Top Insulation Layer</u>	<u>Insulation Fasteners</u> (Table 3)	<u>Fastener</u> <u>Density/ft²</u>
BP High Strength, FM-90 Traffic Top/High Density, GAFTEMP Fiberboard, GAFTEMP High Density, Roof Insulation Board, High Density Fiberboard, Fiber Base HD1, HD6, Structodek, Armor Board Regular, Esgard, Celotex Fiberboard, Huebert Fiberboard, Kop-R Wood Fiber, ConPerl, GAFTEMP Permalite, Fesco Board, GAFTEMP Recover Board, Retrofit Board Minimum ½" thick	1, 5, 8, 13, 14 & 17	1:3 ft ²
DensDeck, DensDeck Prime Minimum ½" thick	1, 5, 8, 13, 14 & 17	1:3 ft ²
Standard or Wide Flute Fiberglass Roof Insulation, Standard or Wide Flute Fiber Glass Roof Insulation, Fiber Glass Roof Insulation (Standard or Wide Flute) Minimum 1 ⁵ / ₁₆ " thick	1, 5, 8, 13, 14 & 17	1:3 ft ²

Note: All layers of insulation shall be mechanically attached using the fastener density listed above. The insulation panels listed are minimum sizes and dimensions; if larger panels are used, the number of fasteners shall be increased maintaining the same fastener density. Insulation fasteners shall be tested for withdrawal resistance in compliance with Testing Application Standard TAS 105 to confirm compliance with the wind load requirements. Please refer to Roofing Application Standard RAS 117 for insulation attachment.

Base/Ply Sheet: One or more plies of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base, HPR Glasfelt, HPR Premium Glasfelt, HPR Polyscrim Plus, or other Approved ASTM D 2178, type IV or VI ply sheet or other approved ASTM D 4601 Type II base sheet adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs./sq. (Note: Minimum two plies of ASTM D 2178, type VI or three plies of type IV is required for VersiPly 60 applications.)

Or

Two or more plies of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base Premium or approved ASTM D 4601, Type II ply sheet adhered with Weatherking or Weatherking Plus WC applied at 2½ gal./sq.



Membrane: One ply of StressPly E, StressPly E Mineral, StressPly E FR Mineral, StressPly, StressPly Mineral, StressPly FR Mineral, StressPly Plus, StressPly Plus FR Mineral, StressPly EUV, StressPly EUV Mineral, StressPly EUV FR Mineral, VersiPly 60, VersiPly 80, or VersiPly Mineral adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs./sq. or with Weatherking or Weatherking Plus WC applied at 2½ gal./sq. (Note: VersiPly 60 is not compatible with Weatherking/Weatherking Plus WC.)

Surfacing: Optional for FR or mineral surfaced Membranes. Required for non-FR or smooth surfaced membranes. Apply one of the below or any approved coatings:

1. 400 lb./sq. gravel or 300 lb./sq. slag in a flood coat of approved mopping asphalt at an application rate of 60 lb./sq. or in BlackKnight Flood Coat or Black-Knight LV Flood Coat at 70 lb/sq. or BlackKnight Cold or BlackKnight WB at 5 gal/sq. (asphalt applied systems only, Not compatible with Weatherking and Weatherking Plus WC applied systems)
2. Minimum two coats of Garla-Brite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
3. Energizer FR applied at 3 gal./sq. or Energizer K Plus FR applied at 3.5 gal/sq with minimum two coats of Garla-Brite applied at min 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
4. WeatherScreen applied at min. 4 gal./sq. with minimum two coats of GarlaBrite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat .
5. WeatherScreen applied at min. 4 gal./sq. with #11 roofing granules at 60 lb./sq.
6. WeatherScreen applied at applied at min. 4 gal./sq. with roofing gravel applied at 400 lb./sq.

Maximum Design Pressure:

-60 psf (for coverboard of 1" thick High Density Wood Fiberboard mechanically attached at 1 per 2 ft² with asphalt applied membranes.) (See General Limitation #7.)

-45 psf (for all other applications) (See General Limitation #9.)



Deck Type 2I: Steel, Insulated

Deck Description: 18-22 ga. steel

System Type C(2): All layers of insulation simultaneously attached.

All General and System Limitations apply.

<u>Base Insulation Layer</u>	<u>Insulation Fasteners</u> <u>(Table 3)</u>	<u>Fastener</u> <u>Density/ft²</u>
Pyrox, WhiteLine, Millox, ACFoam II, Isotherm R, E'NRG'Y-2, PSI-25, UltraGard, ISO-95+GL Minimum 1.5" thick	N/A	N/A
JM Fiber Glass Roof Insulation (Standard or Wide Flute), Owens Corning Standard or Wide Flute Fiberglas Roof Insulation Minimum 1 ⁵ / ₁₆ " thick	N/A	N/A

Note: All layers shall be simultaneously fastened; see top layer below for fasteners and density.

<u>Top Insulation Layer</u>	<u>Insulation Fasteners</u> <u>(Table 3)</u>	<u>Fastener</u> <u>Density/ft²</u>
BP High Strength, FM-90 Traffic Top/High Density, GAFTEMP High Density, Roof Insulaiton Board, High Density Fiberboard, Sturdi-Top, Fiber Base HD1, HD6, Structodek FS Minimum 1/2" thick	1, 2, 5, 8, 13, 14 & 17	1:2.67 ft ²
DensDeck, DensDeck Prime Minimum 1/2" thick	1, 2, 5, 8, 13, 14 & 17	1:2.67 ft ²
JM Fiber Glass Roof Insulation (Standard or Wide Flute), Owens Corning Standard or Wide Flute Fiberglas Roof Insulation Minimum 1 ⁵ / ₁₆ " thick	1	1:2 ft ²

Note: All layers of insulation shall be mechanically attached using the fastener density listed above. The insulation panels listed are minimum sizes and dimensions; if larger panels are used, the number of fasteners shall be increased maintaining the same fastener density. Insulation fasteners shall be tested for withdrawal resistance in compliance with Testing Application Standard TAS 105 to confirm compliance with the wind load requirements. Please refer to Roofing Application Standard RAS 117 for insulation attachment.

Base/Ply Sheet: One or more plies of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base Premium, HPR Glasfelt, HPR Premium Glasfelt or other Approved ASTM D 2178, type IV or VI ply sheet or other approved ASTM D 4601 Type II base sheet adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs./sq.
Or
One ply of HPR Torch Base Sheet, torch applied to coverboard.

Membrane: One ply of StressPly IV, StressPly IV UV Mineral or StressPly IV Mineral, torch applied.



Surfacing:

Optional for StressPly IV Mineral, or StressPly IV UV Mineral. Required for StressPly IV. Apply one of the below or any approved coating.

1. Minimum two coats of Garla-Brite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
2. 400 lb./sq. gravel or 300 lb./sq. slag in a flood coat of approved mopping asphalt at an application rate of 60 lb./sq. or in BlackKnight Flood Coat or BlackKnight LV Flood Coat at 70 lb./sq. or BlackKnight Cold or BlackKnight WB at 5 gal/sq.

**Maximum Design
Pressure:**

-45 psf (See General Limitation #9.)



Deck Type 2I: Steel, Insulated

Deck Description: 18-22 ga. steel Type B Grade 33 steel deck attached with Traxx/5 fasteners 6" o.c. (every flute) to steel supports spaced 6' o.c.

System Type C(3): All layers of insulation simultaneously attached.

All General and System Limitations apply.

<u>Insulation Base Layer</u> <u>(Optional)</u>	<u>Insulation Fasteners</u> <u>(Table 3)</u>	<u>Fastener</u> <u>Density/ft²</u>
ACFoam II, ENRGY 3, H-Shield, Multi-Max FA3 Minimum 1.5" thick	N/A	N/A

Note: All layers shall be simultaneously fastened; see top layer below for fasteners and density.

<u>Top Insulation Layer</u>	<u>Insulation Fasteners</u> <u>(Table 3)</u>	<u>Fastener</u> <u>Density/ft²</u>
DensDeck Prime Minimum 1/2" thick	1 & 3 or 6, 12 & 21, 18 & 20	1:1 ft ²

Note: All layers of insulation shall be mechanically attached using the fastener density listed above. The insulation panels listed are minimum sizes and dimensions; if larger panels are used, the number of fasteners shall be increased maintaining the same fastener density. Insulation fasteners shall be tested for withdrawal resistance in compliance with Testing Application Standard TAS 105 to confirm compliance with the wind load requirements. Please refer to Roofing Application Standard RAS 117 for insulation attachment.

Base/Ply Sheet: One or more plies of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base Premium, HPR Glasfelt, HPR Premium Glasfelt or other approved ASTM D 2178 Type IV or VI ply sheet or other approved ASTM D 4601 Type II base sheet adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 25 lbs./sq. (Note: Minimum two plies of ASTM D 2178, type VI or three plies of type IV is required for VersiPly 60 applications.)

Or

One ply of HPR Torch Base Sheet, torch applied to coverboard

Membrane: One ply of StressPly E, StressPly E Mineral, StressPly E FR Mineral, StressPly, StressPly Mineral, StressPly FR Mineral, StressPly Plus, StressPly Plus FR Mineral, StressPly EUV, StressPly EUV Mineral, StressPly EUV FR Mineral, VersiPly 60, VersiPly 80, or VersiPly Mineral adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 25 lbs./sq.

Or

One ply of StressPly IV, StressPly IV UV Mineral or StressPly IV Mineral, torch applied.nnn



Surfacing:

Optional for FR or mineral surfaced Membranes. Required for non-FR or smooth surfaced membranes. Apply one of the below or any approved coatings:

1. 400 lb./sq. gravel or 300 lb./sq. slag in a flood coat of approved mopping asphalt at an application rate of 60 lb./sq. or in BlackKnight Flood Coat or Black-Knight LV Flood Coat at 70 lb/sq. or BlackKnight Cold or BlackKnight WB at 5 gal/sq. (asphalt applied systems only, Not compatible with Weatherking and Weatherking Plus WC applied systems)
2. Minimum two coats of Garla-Brite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
3. Energizer FR applied at 3 gal./sq. or Energizer K Plus FR applied at 3.5 gal/sq with minimum two coats of Garla-Brite applied at min 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
4. WeatherScreen applied at min. 4 gal./sq. with minimum two coats of GarlaBrite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat .
5. WeatherScreen applied at min. 4 gal./sq. with #11 roofing granules at 60 lb./sq.
6. WeatherScreen applied at applied at min. 4 gal./sq. with roofing gravel applied at 400 lb./sq.

Maximum Design Pressure:

-150.0 psf (See General Limitation #7)



Deck Type 2I: Steel, Insulated
Deck Description: 18-22 ga. steel
System Type D(1): All layers of insulation and base sheet simultaneously attached.
Deck: 18-22 ga Grade C steel deck attached 6' o.c. (every flute) using 3/4"puddle welds to steel supports spaced 5 ft. o.c.

All General and System Limitations apply.

<u>Base Insulation Layer</u>	<u>Insulation Fasteners</u> (Table 3)	<u>Fastener</u> <u>Density/ft²</u>
Pyrox, WhiteLine, Millox, ACfoam II, Isotherm R, E'NRG'Y-2, ENRGY 3, PSI-25, UltraGard, ISO-95+GL Minimum 1" thick	N/A	N/A
<u>Top Insulation Layer (Optional)</u>	<u>Insulation Fasteners</u> (Table 3)	<u>Fastener</u> <u>Density/ft²</u>
BP High Strength, FM-90 Traffic Top/High Density, GAFTEMP High Density, Roof Insulation Board, High Density Fiberboard, Fiber Base HD1, HD6, Structodek Minimum 1/2" thick	N/A	N/A
DensDeck, DensDeck Prime Minimum 1/4" thick	N/A	N/A

Note: All layers of insulation and base sheet shall be simultaneously attached. See base sheet below for fasteners and density. Refer to Roofing Application Standard RAS 117 for insulation attachment requirements. Insulation shall have preliminary attachment, prior to the installation of the roofing membrane. At an application rate of two fasteners per board for insulation boards having no dimension greater than 4 ft., and four fasteners for any insulation board having no dimension greater than 8 ft.

Base Sheet: *(Option #1)* One ply of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base Premium, GAFGLAS Stratavent, JM PermaPly R, JM Dynabase, JM Ventsulation, Tamko Vapor-Chan, Intec Permavent or Intec FlexBase 60 fastened to the deck using Buildex Accutrak Fasteners and Plates spaced 12" o.c. in a 4" lap and 12" o.c. in two staggered rows in the center of the sheet.

(Option #2) One ply of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base Premium, GAFGLAS Stratavent, GS Flex-I-Glas Base, Malarkey #501, Tamko Glass-Base, Vapor-Chan or Base-N-Ply fastened to the deck using SFS #12 or HD Insulfixx S, Olympic #12 or HD with Olympic Standard Plates, or Buildex Accutrak Fasteners and Plates spaced 9" o.c. in a 4" lap and 9" o.c. in two staggered rows in the center of the sheet.

Intermediate Coverboard: (Optional) 1/2" thick High Density Wood Fiberboard adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs./sq.



Ply Sheet: One or more plies of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base Premium, HPR Glasfelt, HPR Premium Glasfelt, , HPR Polyscrim Plus, or other Approved ASTM D.2178, type IV or VI ply sheet or other approved ASTM D 4601 Type II base sheet adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs./sq. (Note: Minimum two plies of ASTM D 2178, type VI or three plies of type IV is required for VersiPly 60 applications.)

Membrane: One ply of StressPly E, StressPly E Mineral, StressPly E FR Mineral, StressPly, StressPly Mineral, StressPly FR Mineral, StressPly Plus, StressPly Plus FR Mineral, StressPly EUV, StressPly EUV Mineral, StressPly EUV FR Mineral, VersiPly 60, VersiPly 80, or VersiPly Mineral adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs./sq.

Surfacing: Optional for FR or mineral surfaced Membranes. Required for non-FR or smooth surfaced membranes. Apply one of the below or any approved coatings:

1. 400 lb./sq. gravel or 300 lb./sq. slag in a flood coat of approved mopping asphalt at an application rate of 60 lb./sq. or in BlackKnight Flood Coat or Black-Knight LV Flood Coat at 70 lb/sq. or BlackKnight Cold or BlackKnight WB at 5 gal/sq. (asphalt applied systems only, Not compatible with Weatherking and Weatherking Plus WC applied systems)
2. Minimum two coats of Garla-Brite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
3. Energizer FR applied at 3 gal./sq. or Energizer K Plus FR applied at 3.5 gal/sq with minimum two coats of Garla-Brite applied at min 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
4. WeatherScreen applied at min. 4 gal./sq. with minimum two coats of GarlaBrite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat .
5. WeatherScreen applied at min. 4 gal./sq. with #11 roofing granules at 60 lb./sq.
6. WeatherScreen applied at applied at min. 4 gal./sq. with roofing gravel applied at 400 lb./sq.

Maximum Design Pressure: -60 psf (See General Limitation #7.)



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Expiration Date: 12/02/11
Approval Date: 05/17/07
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Deck Type 2I: Steel, Insulated

Deck Description: 18-22 ga. steel

System Type D(2): All layers of insulation and base sheet simultaneously attached.

Deck: 18-22 ga Grade C steel deck attached 6' o.c. (every flute) using 3/4"puddle welds to steel supports spaced 5 ft. o.c.

All General and System Limitations apply.

<u>Base Insulation Layer</u>	<u>Insulation Fasteners</u> (Table 3)	<u>Fastener</u> <u>Density/ft²</u>
Pyrox, WhiteLine, Millox, ACFoam II, Isotherm R, E'NRG'Y-2, ENRGY 3, PSI-25, UltraGard, ISO-95+GL Minimum 1" thick	N/A	N/A
<u>Top Insulation Layer (Optional)</u>	<u>Insulation Fasteners</u> (Table 3)	<u>Fastener</u> <u>Density/ft²</u>
BP High Strength, FM-90 Traffic Top/High Density, GAFTEMP High Density, Roof Insulation Board, High Density Fiberboard, Fiber Base HD1, HD6, Structodek Minimum 1/2" thick	N/A	N/A
DensDeck, DensDeck Prime Minimum 1/4" thick	N/A	N/A

Note: All layers of insulation and base sheet shall be simultaneously attached. See base sheet below for fasteners and density. Refer to Roofing Application Standard RAS 117 for insulation attachment requirements. Insulation shall have preliminary attachment, prior to the installation of the roofing membrane. At an application rate of two fasteners per board for insulation boards having no dimension greater than 4 ft., and four fasteners for any insulation board having no dimension greater than 8 ft.

Base Sheet: *(Option #1)* One ply of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base Premium, Celotex Vaporbar GB, GAFGLAS Stratavent, JM PermaPly R, JM Dynabase, JM Ventsulation, Tamko Vapor-Chan, Intec Permavent or Intec FlexBase 60 fastened to the deck using Buildex Accutrac Fasteners and Plates spaced 12" o.c. in a 4" lap and 12" o.c. in two staggered rows in the center of the sheet.

(Option #2) One ply of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base Premium, GAFGLAS Stratavent, GS Flex-I-Glas Base, Malarkey #501, Tamko Glass-Base, Vapor-Chan or Base-N-Ply fastened to the deck using SFS #12 or HD Insulfixx S, Olympic #12 or HD with Olympic Standard Plates, or Buildex Accutrac Fasteners and Plates spaced 9" o.c. in a 4" lap and 9" o.c. in two staggered rows in the center of the sheet.

Intermediate Coverboard: (Optional) 1/2" thick High Density Wood Fiberboard adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs./sq.



- Ply Sheet:** One or more plies of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base Premium, HPR Glasfelt, HPR Premium Glasfelt or other Approved ASTM D 2178, type IV or VI ply sheet or other approved ASTM D 4601 Type II base sheet adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 20-40 lbs./sq.
Or
One ply of HPR Torch Base, torch applied to base sheet (no intermediate coverboard)
- Membrane:** One ply of StressPly IV, StressPly IV UV Mineral or StressPly IV Mineral, torch applied.
- Surfacing:** Optional for Stress Ply IV Mineral or StressPly IV UV Mineral. Required for StressPly IV. Apply one of the below or any approved coating.
1. Minimum two coats of Garla-Brite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
 2. 400 lb./sq. gravel or 300 lb./sq. slag in a flood coat of approved mopping asphalt at an application rate of 60 lb./sq. or in BlackKnight Flood Coat or BlackKnight LV Flood Coat at 70 lb/sq. or BlackKnight Cold or Black-Knight WB at 5 gal/sq.
- Maximum Design Pressure:** -60 psf (See General Limitation #7.)



Deck Type 2I: Steel, Insulated

Deck Description: 18-22 ga. steel Type B Grade 33 steel deck attached with Traxx/5 fasteners 6" o.c. (every flute) to steel supports spaced 6' o.c.

System Type D(3): All layers of insulation and base sheet simultaneously attached.

All General and System Limitations apply.

<u>Insulation Layer</u>	<u>Insulation Fasteners (Table 3)</u>	<u>Fastener Density/ft²</u>
ACFoam II, ENRGY 3, H-Shield, Multi-Max FA3 Minimum 1.5" thick	N/A	N/A
DensDeck, DensDeck Prime Minimum 1/4" thick	N/A	N/A
High Density Wood Fiberboard Minimum 1/2" thick	N/A	N/A

Note: All layers of insulation and base sheet shall be simultaneously attached. See base sheet below for fasteners and density. Refer to Roofing Application Standard RAS 117 for insulation attachment requirements. Insulation shall have preliminary attachment, prior to the installation of the roofing membrane. At an application rate of two fasteners per board for insulation boards having no dimension greater than 4 ft., and four fasteners for any insulation board having no dimension greater than 8 ft.

Base Sheet: One ply of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus or HPR Tri-Base Premium fastened to the deck as described below:

Fastening: Tru-Fast MP3 plates with Tru-Fast HD fasteners, OMG Standard Metal Plates with OMG Heavy Duty fasteners, ITW Buildex Flat Bottom Plates with #14 Rofgrip fasteners or SFS Intec Dekfast Hex plates with Dekfast #14 fasteners spaced 6" o.c. within 4" wide lap and 6" o.c. within three equally spaced staggered rows in the field.

Ply Sheet: One or more plies of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base Premium, HPR Glasfelt, HPR Premium Glasfelt or other approved ASTM D 2178 Type IV or VI ply sheet or other approved ASTM D 4601 Type II base sheet adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 25 lbs./sq. (Note: Minimum two plies of ASTM D 2178, type VI or three plies of type IV is required for VersiPly 60 applications.)

Membrane: One ply of StressPly E, StressPly E Mineral, StressPly E FR Mineral, StressPly, StressPly Mineral, StressPly FR Mineral, StressPly Plus, StressPly Plus FR Mineral, StressPly EUV, StressPly EUV Mineral, StressPly EUV FR Mineral, VersiPly 60, VersiPly 80, or VersiPly Mineral adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 25 lbs./sq.



Surfacing:

Optional for FR or mineral surfaced Membranes. Required for non-FR or smooth surfaced membranes. Apply one of the below or any approved coatings:

1. 400 lb./sq. gravel or 300 lb./sq. slag in a flood coat of approved mopping asphalt at an application rate of 60 lb./sq. or in BlackKnight Flood Coat or Black-Knight LV Flood Coat at 70 lb./sq. or BlackKnight Cold or BlackKnight WB at 5 gal./sq. (asphalt applied systems only, Not compatible with Weatherking and Weatherking Plus WC applied systems)
2. Minimum two coats of Garla-Brite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
3. Energizer FR applied at 3 gal./sq. or Energizer K Plus FR applied at 3.5 gal/sq with minimum two coats of Garla-Brite applied at min 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat.
4. WeatherScreen applied at min. 4 gal./sq. with minimum two coats of GarlaBrite applied at min. 0.5 gal/sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal/sq/coat .
5. WeatherScreen applied at min. 4 gal./sq. with #11 roofing granules at 60 lb./sq.
6. WeatherScreen applied at applied at min. 4 gal./sq. with roofing gravel applied at 400 lb./sq.

Maximum Design Pressure:

-135.0 psf (See General Limitation #7)



Deck Type 2I: Steel, Insulated

Deck Description: 18-22 ga. steel Type B Grade 33 steel deck attached with Traxx/5 fasteners 6" o.c. (every flute) to steel supports spaced 6' o.c.

System Type D(4): All layers of insulation and base sheet simultaneously attached.

All General and System Limitations apply.

<u>Insulation Layer</u>	<u>Insulation Fasteners (Table 3)</u>	<u>Fastener Density/ft²</u>
ACFoam II, ENRGY 3, H-Shield, Multi-Max FA3 Minimum 1.5" thick	N/A	N/A
DensDeck, DensDeck Prime Minimum ¼" thick	N/A	N/A
High Density Wood Fiberboard Minimum ½" thick	N/A	N/A

Note: All layers of insulation and base sheet shall be simultaneously attached. See base sheet below for fasteners and density. Refer to Roofing Application Standard RAS 117 for insulation attachment requirements. Insulation shall have preliminary attachment, prior to the installation of the roofing membrane. At an application rate of two fasteners per board for insulation boards having no dimension greater than 4 ft., and four fasteners for any insulation board having no dimension greater than 8 ft.

Base Sheet: One ply HPR Tri-Base Plus or HPR Tri-Base Premium

Fastening: ITW Buildex Flat Bottom Plates and #15 Roofgrip fasteners spaced 12" o.c. within 4" wide lap and 18" o.c. in two equally spaced staggered rows in the field.

Ply Sheet: One or more plies of HPR Glasbase, HPR Premium Glasbase, HPR Tri-Base Plus, HPR Tri-Base Premium, HPR Glasfelt, HPR Premium Glasfelt or other approved ASTM D 2178 Type IV or VI ply sheet or other approved ASTM D 4601 Type II base sheet adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 25 lbs./sq. (Note: Minimum two plies of ASTM D 2178, type VI or three plies of type IV is required for VersiPly 60 applications.)

Or

One or more plies of HPR Torch Base Sheet, torch applied

Membrane: One ply of StressPly E, StressPly E Mineral, StressPly E FR Mineral, StressPly, StressPly Mineral, StressPly FR Mineral, StressPly Plus, StressPly Plus FR Mineral, StressPly EUV, StressPly EUV Mineral, StressPly EUV FR Mineral, VersiPly 60, VersiPly 80, or VersiPly Mineral adhered with a full mopping of approved asphalt, HPR All Temp, Garlastic KM, or Garlastic KM Plus within the EVT range and at a rate of 25 lbs./sq.

Or

One ply of StressPly IV, StressPly IV UV Mineral or StressPly IV Mineral, torch applied.



Surfacing:

Optional for FR or mineral surfaced Membranes. Required for non-FR or smooth surfaced membranes. Apply one of the below or any approved coatings:

1. 400 lb./sq. gravel or 300 lb./sq. slag in a flood coat of approved mopping asphalt at an application rate of 60 lb./sq. or in BlackKnight Flood Coat or Black-Knight LV Flood Coat at 70 lb./sq. or BlackKnight Cold or BlackKnight WB at 5 gal./sq. (asphalt applied systems only, Not compatible with Weatherking and Weatherking Plus WC applied systems)
2. Minimum two coats of Garla-Brite applied at min. 0.5 gal./sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal./sq/coat.
3. Energizer FR applied at 3 gal./sq. or Energizer K Plus FR applied at 3.5 gal./sq with minimum two coats of Garla-Brite applied at min 0.5 gal./sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal./sq/coat.
4. WeatherScreen applied at min. 4 gal./sq. with minimum two coats of GarlaBrite applied at min. 0.5 gal./sq/coat or minimum two coats of Pyramic applied at min. 1.0 gal./sq/coat .
5. WeatherScreen applied at min. 4 gal./sq. with #11 roofing granules at 60 lb./sq.
6. WeatherScreen applied at applied at min. 4 gal./sq. with roofing gravel applied at 400 lb./sq.

**Maximum Design
Pressure:**

-112.5 psf (See General Limitation #7)



STEEL DECK SYSTEM LIMITATIONS:

1. If mechanical attachment to the structural deck through the lightweight insulating concrete is proposed, a field withdrawal resistance testing shall be performed to determine equivalent or enhanced fastener patterns and density. All testing and fastening design shall be in compliance with Testing Application Standard TAS 105 and Roofing Application Standard RAS 117, calculations shall be signed and sealed by a Florida Registered Engineer, Architect, or Registered Roof Consultant.
2. For steel deck application where specific deck construction is not referenced: The deck shall be a minimum 22 gage attached with 5/8" puddle welds with weld washers at every flute with maximum deck spans of 5 ft. o.c.

GENERAL LIMITATIONS:

1. Fire classification is not part of this acceptance, refer to a current Approved Roofing Materials Directory for fire ratings of this product.
2. Insulation may be installed in multiple layers. The first layer shall be attached in compliance with Product Control Approval guidelines. All other layers shall be adhered in a full mopping of approved asphalt applied within the EVT range and at a rate of 20-40 lbs./sq., or mechanically attached using the fastening pattern of the top layer
3. All standard panel sizes are acceptable for mechanical attachment. When applied in approved asphalt, panel size shall be 4' x 4' maximum.
4. An overlay and/or recovery board insulation panel is required on all applications over closed cell foam insulations when the base sheet is fully mopped. If no recovery board is used the base sheet shall be applied using spot mopping with approved asphalt, 12" diameter circles, 24" o.c.; or strip mopped 8" ribbons in three rows, one at each sidelap and one down the center of the sheet allowing a continuous area of ventilation. Encircling of the strips is not acceptable. A 6" break shall be placed every 12' in each ribbon to allow cross ventilation. Asphalt application of either system shall be at a minimum rate of 12 lbs./sq. **Note: Spot attached systems shall be limited to a maximum design pressure of -45 psf.**
5. Fastener spacing for insulation attachment is based on a Minimum Characteristic Force (F') value of 275 lbf., as tested in compliance with Testing Application Standard TAS 105. If the fastener value, as field-tested, are below 275 lbf. insulation attachment shall not be acceptable.
6. Fastener spacing for mechanical attachment of anchor/base sheet or membrane attachment is based on a minimum fastener resistance value in conjunction with the maximum design value listed within a specific system. Should the fastener resistance be less than that required, as determined by the Building Official, a revised fastener spacing, prepared, signed and sealed by a Florida registered Professional Engineer, Registered Architect, or Registered Roof Consultant may be submitted. Said revised fastener spacing shall utilize the withdrawal resistance value taken from Testing Application Standards TAS 105 and calculations in compliance with Roofing Application Standard RAS 117.
7. Perimeter and corner areas shall comply with the enhanced uplift pressure requirements of these areas. Fastener densities shall be increased for both insulation and base sheet as calculated in compliance with Roofing Application Standard RAS 117. Calculations prepared, signed and sealed by a Florida registered Professional Engineer, Registered Architect, or Registered Roof Consultant **(When this limitation is specifically referred within this NOA, General Limitation #9 will not be applicable.)**
8. All attachment and sizing of perimeter nailers, metal profile, and/or flashing termination designs shall conform with Roofing Application Standard RAS 111 and applicable wind load requirements.
9. The maximum designed pressure limitation listed shall be applicable to all roof pressure zones (i.e. field, perimeters, and corners). Neither rational analysis, nor extrapolation shall be permitted for enhanced fastening at enhanced pressure zones (i.e. perimeters, extended corners and corners). **(When this limitation is specifically referred within this NOA, General Limitation #7 will not be applicable.)**

END OF THIS ACCEPTANCE



NOA No.: 06-1120.02
Expiration Date: 12/02/11
Approval Date: 05/17/07
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