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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
SECTION: 07 54 00—THERMOPLASTIC MEMBRANE ROOFING
SECTION: 07 54 19—POLYVINYL-CHLORIDE ROOFING

REPORT HOLDER:

SIKA SARNAFIL, INC.

100 DAN ROAD
CANTON, MASSACHUSETTS 02021

EVALUATION SUBJECT:

S327, G410, SIKAPLAN AND SIKAPLAN ADHERED SINGLE-PLY ROOFING SYSTEMS

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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 54 00—Thermoplastic Membrane Roofing
Section: 07 54 19—Polyvinyl-Chloride Roofing

REPORT HOLDER:

SIKA SARNAFIL, INC.
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(781) 332-3224
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EVALUATION SUBJECT:

S327, G410, SIKAPLAN AND SIKAPLAN ADHERED SINGLE-PLY ROOFING SYSTEMS

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2015, 2012, 2009 and 2006 *International Building Code®* (IBC)
- 2015, 2012, 2009 and 2006 *International Residential Code®* (IRC)

Properties evaluated:

- Weather resistance
- Wind uplift resistance
- Roof covering fire classification
- Impact resistance

2.0 USES

The Sarnafil S327, G410, Sikaplan and Sikaplan Adhered Single-Ply Roofing Systems are used as classified roof covering assemblies.

3.0 DESCRIPTION

3.1 General:

The Sarnafil Single-Ply Roofing Systems consist of single-ply reinforced thermoplastic membranes constructed with reinforced poly (vinyl chloride) (PVC). The systems can be installed over various types of roof decking, including wood, steel and concrete surfaces. The systems are either adhered, mechanically fastened or a combination of mechanically fastened and adhered to resist wind uplift. Sarnafil membranes are manufactured in rolls 3.25, 5, 6.5 and 10 feet wide (914, 1520, 1980 and 3050 mm) with lengths from 65.6 to 100 feet (20 to 30.5 m). The membranes are typically manufactured with a white weathering surface and a grey underside. However, custom pigments are available upon request.

3.2 Materials:

3.2.1 Sarnafil S327 Single-Ply Membrane: The Sarnafil S327 membrane is a polyester reinforced PVC membrane complying with ASTM D4434 as Type III, and available with or without a factory-applied felt backing. The Sarnafil S327 is manufactured in four thicknesses. See Table 4 for thicknesses and weights of the membranes with and without the felt backing. The membrane is reinforced with a polyester scrim. Sarnafil S327 is intended for installation over foam plastic insulation when attached with mechanical fasteners described in Section 3.2.6 and Table 2.

3.2.2 Sarnafil G410 Single-Ply Membrane: The Sarnafil G410 membrane, typically used in adhered systems, is a glass fiber–reinforced PVC membrane complying with ASTM D4434 as Type II, and is available with or without factory-applied felt backing. The Sarnafil G410 is manufactured in four thicknesses. See Table 4 for thicknesses and weights of the membranes with and without the felt backing. The fiberglass reinforcement is arranged in a woven mat. Sarnafil G410 is intended for installation over insulation when fully adhered to the substrate using proprietary adhesives as described in Section 3.2.7 and Table 3.

3.2.3 Sarnafil Sikaplan Single-Ply Membrane: The Sikaplan membrane is a polyester reinforced PVC membrane complying with ASTM D4434 as Type III, and available with or without a factory-applied felt backing. The Sarnafil Sikaplan is manufactured in two thicknesses. See Table 4 for thicknesses and weights of the membranes with and without the felt backing. The membrane is reinforced with a polyester scrim. Sikaplan is intended for installation over foam plastic insulation as indicated in Table 1 when attached with mechanical fasteners described in Section 3.2.6 and Table 2.

3.2.4 Sarnafil Sikaplan Adhered Membrane: The Sikaplan Adhered membrane, used in adhered systems, is a glass fiber–reinforced PVC membrane complying with ASTM D4434 as Type II, and is available with or without factory-applied felt backing. The Sarnafil Sikaplan Adhered membranes are manufactured in two thicknesses. See Table 4 for thicknesses and weights of the membranes with and without the felt backing. The fiberglass reinforcement is arranged in a woven mat.

Sarnafil Sikaplan Adhered is intended for installation over insulation that is attached to roof decks as indicated in Table 1 when fully adhered to the substrate using proprietary adhesives as described in Section 3.2.7 and Table 3.

3.2.5 Foam Plastic Insulation: Foam plastic insulation, where used, must have a flame-spread index of not greater than 75 when tested, at the maximum thickness intended for use, in accordance with ASTM E84 or UL 723. See Tables 1, 2 and 3 for insulations recognized for use with the respective roofing systems.

3.2.6 Mechanical Fasteners: Substrate, fastener and plate combinations must be as outlined in the manufacturer's published installation instructions and Table 2 of this report.

3.2.6.1 Sarnafastener #12: The Sarnafastener #12 is used with the Sarnaplate, described in Section 3.2.6.4, to attach insulation boards to steel or combustible roof decks. Sarnafastener #12 has a modified buttress thread, a shank diameter of 0.168 inch (4.3 mm) and a thread diameter of 0.214 inch (5.4 mm).

3.2.6.2 Sarnafastener XP: The Sarnafastener XP is used with the Sarnadisc, described in Section 3.2.6.5, to attach insulation, and with the Sarnadisc XPN, described in Section 3.2.6.7, or the Sarnarail Polymer Batten, described in Section 3.2.6.10, to attach the membrane (through the insulation) to combustible or noncombustible roof decks. The Sarnafastener XP has a shank diameter of 0.21 inch (5.3 mm) and thread diameter of 0.26 inch (6.6 mm).

3.2.6.3 Sarnafastener MAXLoad: The Sarnafastener MAXLoad is used to attach the Sarnafil membrane with the Sarnadisc MAXLoad, described in Section 3.2.6.8, or Sarnarail Polymer Batten, described in Section 3.2.6.10, to steel or combustible decks. The Sarnafastener MAXLoad has a shank diameter of 0.26 inch (6.6 mm) and a thread diameter of 0.33 inch (8.4 mm).

3.2.6.4 Sarnaplate: The Sarnaplate is a 3-by-3-inch (76 mm by 76 mm), No. 26 gage [0.018 to 0.021 inch (0.45 to 0.53 mm) base-metal thickness], AZ 55 Galvalume-coated plate.

3.2.6.5 Sarnadisc: The Sarnadisc is a 3-inch-diameter (76 mm), No. 26 gage [0.018 to 0.021 inch (0.45 to 0.53 mm) base-metal thickness], AZ 55 Galvalume-coated plate.

3.2.6.6 Sarnadisc $2^3/_8$: Sarnadisc $2^3/_8$ is $2^3/_8$-inch (60 mm) diameter, 0.037-inch (0.94 mm) thick plate stamped from Galvalume AZ 50 or AZ 55 steel. It has six equally spaced "v" protrusions punched through concentrically at $^{19}/_{32}$-inch (15 mm) from the center of the plate.

3.2.6.7 Sarnadisc XPN: The Sarnadisc XPN is a $1^1/_2$-by-$3^3/_4$-inch (38 by 95 mm), No. 18 gage [0.040 to 0.042 inch (1.00 to1.05 mm) base-metal thickness], AZ 55 Galvalume-coated plate.

3.2.6.8 Sarnadisc MAXLoad: The Sarnadisc MAXLoad is a 3.5-inch-diameter (89 mm), No. 20 gage [0.031 to 0.041 inch (0.78 to 1.02 mm) base-metal thickness], AZ 55 Galvalume-coated plate.

3.2.6.9 Sarnadisc RhinoBond: Sarnadisc RhinoBond is a 3-inch (75 mm) diameter, 0.028-inch (0.7 mm) thick metal plate coated with a polymer coating used in conjunction with the RhinoBond induction welder to attach the membrane.

3.2.6.10 Sarnarail Polymer Batten: The Sarnarail Polymer Batten is a 1-inch-wide-by-250-foot-long-by-$^1/_{20}$-inch-thick (25 mm by 762 m by 1.27 mm) modified polymer batten. The batten, manufactured in coils, has holes spaced 6 inches (152 mm) on center and is used with either the Sarnafastener XP or the MAXLoad fasteners, described in Sections 3.2.6.2 or 3.2.6.3, respectively, for securing the roof membrane.

3.2.7 Adhesives:

3.2.7.1 Sarnacol 2170: Sarnacol 2170 is a solvent-based adhesive for bonding Sarnafil membranes to foam plastic substrates or Georgia-Pacific LLC DensDeck Roofboard with application rates as specified in Table 3. Sarnacol 2170 is supplied in 5-gallon (18.9 L) steel containers. The shelf life is one year when the adhesive is stored in the original unopened container at temperatures between 40°F and 80°F (4.4°C and 26.7°C).

3.2.7.2 Sarnacol 2170 VC: Sarnacol 2170 VC is a solvent-based adhesive used for bonding Sarnafil membranes to foam plastic substrates or Georgia-Pacific LLC DensDeck® Roof Board with application rates as specified in Table 3. Sarnocol 2170 VC is supplied in 5-gallon (18.9 L) steel containers. The shelf life is one year when the adhesive is stored in the original unopened container at temperatures between 40°F and 80°F (4.4°C and 26.7°C).

3.2.7.3 Sarnacol 2121: Sarnacol 2121 is a water-based adhesive for bonding Sarnafil membranes to foam plastic substrates or Georgia-Pacific LLC DensDeck® Roof Board with application rates as specified in Table 3. Sarnacol 2121 is supplied in 5-gallon (18.9 L) steel containers. The shelf life is one year when the adhesive is stored in the original unopened container at temperatures between 40°F and 80°F (4.4°C and 26.7°C).

3.2.7.4 Sarnacol AD Feltback Membrane Adhesive: Sarnacol AD Adhesive is a two-part liquid applied non-asphaltic urethane adhesive that transforms into a low rise foam during the curing process. The adhesive is packaged in 0.16-gallon (600 mL) cartridges, four to a box or 10-gallon (37.8 L) box sets consisting of two parts: (Part 1 – 5-gallon (18.9 L) and Part 2 – 5-gallon (18.9 L)). The shelf life is 18 months when the adhesive is stored in the original unopened container at temperatures between 45°F and 95°F (7°C and 35°C).

3.2.7.5 Sarnacol OM Feltback Membrane Adhesive: Sarnacol OM Adhesive is a two-part low rise polyurethane adhesive that is applied in one step, dispensed at a 1:1 ratio. The adhesive is packaged in 0.16-gallon (600 mL) cartridges, four to a box or 10-gallon (37.8 L) box sets consisting of two parts: (Part 1 – 5-gallon (18.9 L) and Part 2 – 5-gallon (18.9 L)). The shelf life is 18 months when the adhesive is stored in the original unopened container at temperatures between 55°F and 85°F (12.8°C and 29.5°C).

3.2.8 Barrier Board: Barrier board, where used, must be a minimum of $^1/_4$-inch (6.4 mm) DensDeck® Roof Board manufactured by Georgia-Pacific LLC

3.3 Impact Resistance:

The Sarnafil S327 and G410 Single-Ply Roofing Systems described in this report comply with the requirements for impact resistance in accordance with Section 4.6 of FM 4470.

4.0 INSTALLATION

4.1 General:

Installation of the Sarnafil S327, G410, Sikaplan and Sikaplan Adhered Single-Ply Roofing Systems must comply with the applicable code, this report and the manufacturer's published installation instructions. The

manufacturer's published installation instructions must be available at the jobsite at all times during installation. The substrate must be smooth, dry, clean and free of sharp projections, loose fasteners, protrusions, depressions or contaminants that might interfere with the adhesion or attachment of the membrane. Any surface defects must be corrected prior to the membrane installation. All materials must be protected against contact with incompatible materials. The roof systems must not be installed on roofs having slopes less than $^1/_4$:12 (2 percent slope) or more than that specified for the particular assembly as listed in Table 1 for the corresponding assembly and roof classification.

4.2 Roof Covering Classification:

See Table 1 for a full description of components and the roof covering classification for each of the evaluated systems. The systems must be installed at the maximum slope specified in Table 1.

4.3 Wind Resistance:

See Tables 2 and 3 for a full description of components, fastener spacing, adhesive application and allowable design wind uplift pressures for each of the evaluated systems.

4.3.1 Metal Edge Securement Systems: Metal edge securement systems must be listed in accordance with the 2011 edition of ANSI/SPRI/FM 4435 ES-1, and designed and installed for wind loads in accordance with 2015 IBC Section 1504.5 and 2015 IBC Chapter 16 [2003 edition of ANSI/SPRI/FM 4435 ES-1, and designed and installed for wind loads in accordance with 2012, 2009 and 2006 IBC Section 1504.5 and 2012, 2009 and 2006 IBC Chapter 16].

4.4 Flashing:

Flashing must be provided as required by IBC Section 1503.2.1 or IRC Section R903.2.1, as applicable. Where flashing is of metal, the metal must be corrosion-resistant with a thickness of not less than No. 26 gage [base-metal thickness of 0.019 inch (0.5 mm)].

4.5 Reroofing:

The existing deck must 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 written approval from, the code official having jurisdiction are required in accordance with 2015 IBC Section 1511 [2012, 2009 and 2006 IBC Section 1510]. The roof covering systems described in this report, installed over an existing roof covering system, must be shown to satisfy classification requirements by testing of the composite system in accordance with ASTM E108 or UL 790. As an alternative, Class A, B or C roof covering systems are permitted to be installed over existing classified roof covering systems under the following conditions without additional roof classification tests, provided the resulting classification is the lower of the classification for the new and existing roofing:

- New uninsulated systems installed only over existing uninsulated assemblies.
- New insulated systems installed only over existing uninsulated system

5.0 CONDITIONS OF USE

The Sarnafil S327, G410, Sikaplan and Sikaplan Adhered Single-Ply Roofing Systems described in this report comply with, or are suitable alternatives to what is specified in, the codes indicated in Section 1.0 of this report, subject to the following conditions:

5.1 Installation must comply with this report, the manufacturer's published instructions and the applicable code. If there is a conflict between the manufacturer's published installation instructions and this report, this report governs.

5.2 The Sarnafil S327, G410, Sikaplan and Sikaplan Adhered Single-Ply Roofing Systems must be installed by a Sarnafil, Inc., trained and approved contractor. Evidence of this approval must be made available to the code official upon request.

5.3 Design wind uplift pressures on any roof area, including edge and corner zones, must not exceed the allowable wind uplift pressure for the system installed in that particular area.

5.4 The foam plastic board, utilized in the systems described in this report, must bear the label of an approved agency indicating that the foam plastic has a flame-spread index of no greater than 75 at the maximum thickness intended for use in accordance with ASTM E84 or UL 723.

5.5 Foam plastic must be separated from the interior of the building by an approved thermal barrier in accordance with IBC Section 2603.4, 2015, 2012 and 2009 IRC Section R316.4, or 2006 IRC Section R314.4, as applicable.

5.6 The allowable wind uplift pressures listed in Tables 2 and 3 are for the roof covering systems only. The deck and framing to which the system is attached must be designed for the applicable components and cladding wind loads in accordance with the applicable code.

5.7 Sikaplan and Sikaplan Adhered roofing systems are limited to installation on roof slopes of 2:12 or greater.

5.8 Wind uplift resistance of roof coverings placed over existing roof coverings is outside the scope of this report.

5.9 The Sarnafil S327, G410, Sikaplan and Sikaplan Adhered PVC membranes are produced in Canton, Massachusetts, under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Membrane Roof-covering Systems (AC75), dated July 2010 (editorially revised September 2016).

7.0 IDENTIFICATION

The Sarnafil S327, G410, Sikaplan and Sikaplan Adhered single-ply membranes described in this report must be identified with the manufacturer's name (Sika Sarnafil, Inc.), the product type, the manufacturing date and the evaluation report number (ESR-1157).

TABLE 1—ROOF CLASSIFICATIONS OF SARNAFIL AND SIKAPLAN ROOFING SYSTEMS

SYSTEM NO.	RATING	SUBSTRATE[2]	MAXIMUM ROOF SLOPE	INSULATION, SLIP SHEET, BARRIER BOARD OR COVER BOARD[3]			MEMBRANE[3]	
				Insulation[4,5]	Barrier or Cover Board or Slip Sheet	Attachment	Type	Attachment[1]
1	A	Combustible	Unlimited	(Optional) one or more layers of polyisocyanurate or polystyrene or combination	Minimum 1/4-inch DensDeck® Roof Board	Mechanically fastened	Sarnafil G410	Adhered with Sarnacol 2170 adhesive, 2 gal/sq
2	A	Combustible	Unlimited	(Optional) one or more layers of polyisocyanurate or polystyrene or combination	Minimum 1/4-inch DensDeck® Roof Board	Mechanically fastened	Sarnafil S327, S327 Feltback	Mechanically attached
3	B	Combustible	Unlimited	(Optional) one or more layers of polyisocyanurate or polystyrene or combination	Minimum 1/4-inch DensDeck® Roof Board	Mechanically fastened	Sarnafil G410 Feltback	Adhered with Sarnacol 2121 adhesive, 1.75 gal/sq
4	A	Noncombustible	2:12	RMax Multi-Max-3, and RMax Thermaroof Plus-3	(Optional) Minimum 1/4-inch DensDeck® Roof Board	Mechanically fastened	Sarnafil S327, S327 Feltback	Mechanically attached
5	A	Noncombustible	2:12	RMax Multi-Max-3, and RMax Thermaroof Plus-3	(Optional) Minimum 1/4-inch DensDeck® Roof Board	Mechanically attached	Sarnafil G410, G410 Feltback	Feltback adhered with Sarnacol 2170 adhesive, 1.5 to 2.5 gal/sq, or 2121 adhesive, 1.75 gal/sq
6	A	Combustible	Unlimited	(Optional), one or more layers of polyisocyanurate or polystyrene or combination	Minimum 1/4-inch DensDeck® Roof Board	Mechanically attached	Sarnafil G410 Feltback	Feltback adhered with Sarnacol OM Feltback Membrane Adhesive, 1.75 gal/sq
7	A	Noncombustible	2:12	Hunter Panels H-Shield, Atlas Roofing ACFoam II, IKO IKOTherm III, Johns-Manville ENRGY 3, Rmax Multi-Max FA-3, SarnaTherm insulation board	(Optional) Minimum 1/4-inch DensDeck® Roof Board	Mechanically attached	Sarnafil G410 Feltback	Feltback adhered with Sarnacol OM Feltback Membrane Adhesive or Sarnacol AD Feltback Membrane Adhesive, 1.75 gal/sq
8	A	Combustible	Unlimited	(Optional), one or more layers of polyisocyanurate or polystyrene or combination	Minimum 1/4-inch DensDeck® Roof Board	~~Presecured~~ Mechanically attached with all barrier board butt joints staggered a minimum of 6 inches from plywood deck butt joints	Sikaplan	Mechanically attached
9	A	Noncombustible	1/2:12	Atlas Roofing ACFoam II, Johns-Manville ENRGY 3, Rmax Multi-Max FA-3, SarnaTherm insulation board	Minimum 1/4-inch DensDeck® Roof Board	Mechanically attached	Sikaplan and Sikaplan Feltback	Mechanically attached
10	A	Combustible	4:12	(Optional), one or more layers of polyisocyanurate or polystyrene or combination	Minimum 1/4-inch DensDeck® Roof Board	Mechanically attached	Sikaplan Feltback	Mechanically attached

For **SI:** 1 inch = 25.4 mm; 1 gal/sq = 407 mL/m^2.

[1]The application rate is given in gallons per 100 square feet (gal/sq).
[2]Noncombustible includes concrete and minimum No. 22 gage galvanized steel [0.030-inch-thick (0.76 mm)]. Combustible wood decks must be minimum 15/32-inch-thick (11.9 mm) plywood.
[3]Insulation, barrier, coverboard, coversheet, membrane adhesive and membrane must be UL-classified for roofing system applications.
[4]All foam plastic insulation must be UL-classified foam plastic for roofing systems, and must be limited to the maximum thickness in accordance with Section 5.4.
[5]Polyisocyanurate foam plastic insulation board must comply with ASTM C1289. Extruded polystyrene (XPS) and expanded polystyrene (EPS) foam plastic insulation boards must comply with ASTM C578.

TABLE 2—SIKAPLAN AND SARNAFIL S327 MECHANICALLY ATTACHED ROOFING MEMBRANES ALLOWABLE WIND UPLIFT

SYSTEM NO.	SUBSTRATE[6]	INSULATION[2, 3]		SARNAFIL PVC MEMBRANE					ALLOWABLE WIND UPLIFT CAPACITY (psf)
		Type	Attachment	Fasteners and Plates or Bars[1]	Lap Width (inches)	Weld Width (inches)	Typical Lap Spacing[4] (inches)	Fastener Spacing[1] (inches)	
1	Steel, min. 22 gage	One or more layers of polyisocyanurate, min. 1.3-inch-thick SarnaTherm insulation board	Presecured	Sarnafastener XP and Sarnadisc XPN	5.5	1.75	114.5	6	60
2	Steel, min. 22 gage	One or more layers of polyisocyanurate, min. 1.3-inch-thick SarnaTherm insulation board	Presecured	Sarnafastener XP and Sarnadisc XPN	5.5	1.75	114.5	12	38
3	Steel, min. 22 gage	One or more layers of polyisocyanurate, min. 1.3-inch-thick SarnaTherm insulation board	Presecured	Sarnafastener XP and Sarnarail Polymer Batten	5.5	1.25 outside and 0.75 inside	114.5	6	52
4	Steel, min. 22 gage	One or more layers of polyisocyanurate, min. 1.3-inch-thick SarnaTherm insulation board	Presecured	Sarnafastener MAXLoad and Sarnarail Polymer Batten	5.5	1.25 outside and 0.75 inside	114.5	12	52
5	Steel, min. 22 gage	One or more layers of polyisocyanurate, min. 1.3-inch-thick SarnaTherm insulation board	Presecured	Sarnafastener MAXLoad and Sarnarail Polymer Batten	5.5	1.25 outside and 0.75 inside	114.5	6	60
6	Steel, min. 22 gage	One or more layers of polyisocyanurate, min. 1.3-inch-thick SarnaTherm insulation board	Presecured	Sarnafastener MAXLoad and Sarnadisc MAXLoad	7	1.5	113	12	45
7	Concrete, steel (min. 22 gage) or min. $^3/_4$-inch-thick plywood	One or more layers of polyisocyanurate, min. 1.3-inch-thick SarnaTherm insulation board	Presecured	Sarnafastener XP and Sarnadisc XPN	5.25	1.5	73.5	12	45
8	Concrete, steel (min. 22 gage) or min. $^3/_4$-inch-thick plywood	One or more layers of polyisocyanurate, min. 1.3-inch-thick SarnaTherm insulation board	Presecured	Sarnafastener XP and Sarnadisc XPN	5.25	1.5	73.5	18	30
9	Concrete, steel (min. 22 gage)	One or more layers of polyisocyanurate, min. 1.3-inch-thick SarnaTherm insulation board	Presecured	Sarnafastener XP and Sarnadisc XPN	5.25	1.5	73.5	6	60
10	Steel, min. 22 gage	One or more layers of polyisocyanurate, min. 1.3-inch-thick Sarnatherm insulation board	Presecured	Sarnafastener XP and Sarnadisc $2^3/_8$	5.5	1.75	114.5	6	52.5
11	Steel, min. 22 gage	One or more layers of polyisocyanurate, min. 1.3-inch-thick Sarnatherm insulation board	Presecured	Sarnafastener XP and Sarnadisc $2^3/_8$	5.5	1.75	114.5	12	30
12	Steel, min. 22 gage	One or more layers of polyisocyanurate, min. 1.3-inch-thick Sarnatherm insulation board	Presecured	Sarnafastener XP and Sarnadisc $2^3/_8$	5.5	1.75	54.5	6	75
13	Steel, min. 22 gage	One or more layers of polyisocyanurate, min. 1.3-inch-thick Sarnatherm	Presecured	Sarnafastener XP and Sarnadisc $2^3/_8$	5.5	1.75	54.5	12	45

(Continued)

SYSTEM NO.	SUBSTRATE[6]	INSULATION[2, 3]		SARNAFIL PVC MEMBRANE					ALLOWABLE WIND UPLIFT CAPACITY (psf)
		Type	Attachment	Fasteners and Plates or Bars[1]	Lap Width (inches)	Weld Width (inches)	Typical Lap Spacing[4] (inches)	Fastener Spacing[1] (inches)	
		insulation board							
14	Steel, min. 22 gage	One or more layers of polyisocyanurate, min. 1.3-inch-thick Sarnatherm insulation board	Presecured	Sarnafastener XP and Sarnadisc 2 3/8	5.5	1.75	54.5	18	30
15[7]	Steel, min. 22 gage	One or more layers of polyisocyanurate, min. 1.3-inch-thick Sarnatherm insulation board	Loose Laid	Sarnafastener XP and Sarnadisc RhinoBond	3	0.75	24	24	60
16[7]	Steel, min. 22 gage	One or more layers of polyisocyanurate, min. 1.3-inch-thick Sarnatherm insulation board	Loose Laid	Sarnafastener XP and Sarnadisc RhinoBond	3	0.75	24	36	45

For **SI:** 1 inch = 25.4 mm; 1 lbf/in^2 = 6.89 kPa; 1 lbf/ft^2 = 47.9 Pa; 1 mph = 1.61 km/h.

[1]Fasteners must be of sufficient length to penetrate substrates a minimum of 3/4 inch for steel and 1 inch for wood and concrete. Pilot holes for concrete substrates must be 1/2 inch deeper than fastener embedment.
[2]All foam plastic insulation must be UL-classified foam plastic for roofing systems, and must be limited to a maximum thickness in accordance with Section 5.4.
[3]Polyisocyanurate foam plastic insulation board must comply with ASTM C1289. Extruded polystyrene (XPS) and expanded polystyrene (EPS) foam plastic insulation boards must comply with ASTM C578.
[4]The distance of the first row of fasteners from the roof edge must not exceed 1/2 the typical lap spacing.
[6]Concrete decks must have a minimum compressive strength of 2500 psi, steel decks must be minimum No. 22 gage galvanized steel [0.030-inch-thick (0.76 mm)] and combustible wood decks must be minimum 3/4-inch-thick (19.1 mm) plywood.
[7]Sikaplan membrane as described in Section 3.2.3 may be substituted for Sarnafil S327 membrane for this system.

TABLE 3—ATTACHMENT OF SARNAFIL G410 OR SIKAPLAN ADHERED PVC ROOFING MEMBRANES FOR WIND UPLIFT CAPACITY

SYSTEM NO.	SUBSTRATE	INSULATION[2,3]		COVERBOARD		SARNAFIL PVC MEMBRANE	ALLOWABLE WIND UPLIFT CAPACITY (PSF)
		Type	Attachment	Type	Attachment		
1	Steel, min. 22 gage	Min. 1.5-inch-thick polyisocyanurate Atlas ACFoam II	Loosely laid	5/8-inch DensDeck Prime	Sarnafasteners and Sarnaplates at 1 fastener per 2 sq. ft.	G410 membrane adhered to the cover board with Sarnacol 2170 adhesive applied to the membrane and board at 1.5 gal./100 sq. ft.	60
2	Steel, min. 22 gage	Min. 1.5-inch-thick polyisocyanurate Atlas ACFoam II	Loosely laid	5/8-inch DensDeck Prime	Sarnafasteners and Sarnaplates at 1 fastener per 2 sq. ft.	G410 Feltback membrane or Sikaplan Adhered Feltback membrane adhered to the cover board with Sarnacol 2121 adhesive applied to the cover board at 0.75 gal/100 sq. ft.	52.5
3	Concrete[1]	Johns Manville E'NRGY-2 3, Rmax Multi-Max FA-3, Atlas ACFoam II, and Hunter Panels H-Shield	Adhered to primed concrete with hot asphalt applied at 25 lbs./100 sq. ft.	1/4-inch DensDeck	Adhered to primed concrete with hot asphalt applied at 25 lbs./100 sq. ft.	G410 membrane or Sikaplan Adhered membrane adhered to the cover board with Sarnacol 2170 adhesive applied to the membrane and board at 1.5 gal./100 sq. ft. G410 Feltback adhered to the cover board with Sarnacol 2170 or Sarnacol 2170VC applied to the cover board at 2 gal/100 sq. ft., or Sarnacol 2121 adhesive applied to the cover board at 0.75 gal/100 sq. ft.	232.5
4	Concrete[1]	Johns Manville E'NRGY 3, Rmax Multi-Max FA-3, Atlas ACFoam II, and Hunter Panels H-Shield	Adhered to primed concrete with hot asphalt applied at 25 lbs./100 sq. ft.	---	---	G410 membrane or Sikaplan Adhered membrane adhered to the insulation with Sarnacol 2170 or Sarnacol 2170VC adhesive applied to the membrane and insulation at 1.5 gal./100 sq. ft., or Sarnacol 2121 adhesive applied to the membrane and insulation at 0.75 gal/100 sq. ft.	232.5
5	Steel, min. 22 gage	Min. 1.5-inch-thick Polyisocyanurate Atlas ACFoam II	Loosely laid	1/2-inch DensDeck Prime	Sarnafasteners and Sarnaplate with 1 fastener per 1 sq. ft.	G410 Feltback membrane or Sikaplan Adhered Feltback membrane adhered to the coverboard with Sanacol OM Feltback Membrane Adhesive or Sarnacol AD Feltback Membrane Adhesive applied to the board with	120

(Continued)

SYSTEM NO.	SUBSTRATE	INSULATION[2,3]		COVERBOARD		SARNAFIL PVC MEMBRANE	ALLOWABLE WIND UPLIFT CAPACITY (PSF)
		Type	Attachment	Type	Attachment		
						0.5-inch wide ribbons at 12” o.c.	
6	Steel, min. 22 gage	Min. 1.5-inch-thick Polyisocyanurate Atlas ACFoam II	Sarnafasteners and Sarnaplate with 1 fastener per 2 sq. ft.	--	--	G410 Feltback membrane or Sikaplan Adhered Feltback membrane adhered with Sanacol OM Feltback Membrane Adhesive or Sarnacol AD adhesive applied to the board with 0.5-inch wide ribbons at 12” o.c.	45
7	Concrete[1]	Min. 1.5-inch-thick Polyisocyanurate Atlas ACFoam II	Sarnafasteners and Sarnaplate with 1 fastener per 2 sq. ft.	--	--	G410 Feltback membrane or Sikaplan Adhered Feltback adhered with Sanacol OM Feltback Membrane Adhesive or Sarnacol AD Feltback Membrane Adhesive applied to the board with 0.5-inch wide ribbons at 12” o.c.	45
8	Concrete[1]	--	--	--	--	G410 Feltback membrane or Sikaplan Adhered Feltback membrane adhered to the deck with Sanacol OM Feltback Membrane Adhesive or Sarnacol AD Feltback Membrane Adhesive applied to the board with 0.5-inch wide ribbons at 12” o.c.	120
9	Concrete[1]	--	--	--	--	G410 Feltback membrane or Sikaplan Adhered Feltback membrane adhered to the deck with Sanacol OM Feltback Membrane Adhesive or Sarnacol AD Feltback Membrane Adhesive applied to the substrate with 0.5-inch wide ribbons at 4” o.c.	445

For **SI:** 1 inch = 25.4 mm, 1 lbf/in^2 = 6.89 kPa, 1 lbf/ft2 = 47.9 Pa; 1 gal/sq = 407mL/m^2.

[1]Concrete must have a minimum compressive strength of 2500 psi.
[2]All foam plastic insulation must be UL-classified foam plastic for roofing systems, and must be limited to a maximum thickness in accordance with Section 5.4.
[3]Polyisocyanurate foam plastic insulation board must comply with ASTM C1289. Extruded polystyrene (XPS) and expanded polystyrene (EPS) foam plastic insulation boards must comply with ASTM C578.

TABLE 4—TYPICAL MEMBRANE THICKNESSES AND WEIGHTS

MEMBRANE	THICKNESS (mil)	ACTUAL DIMENSION (inch)	WEIGHT WITH FELT BACKING (psf)	WEIGHT WITHOUT FELT BACKING (psf)
G410, S327	48	0.048	0.375	0.312
G410, S327	60	0.059	0.453	0.390
G410, S327	72	0.071	0.530	0.467
G410, S327	80	0.079	0.582	0.582
Sikaplan 45, Sikaplan Adhered 45	45	0.045	0.341	0.278
Sikaplan 60, Sikaplan Adhered 60	60	0.054	0.411	0.348

For **SI:** 1 inch = 25.4 mm; 1 psf = 47.88 Pa.