ICC-ES Evaluation Report

ESR-1157

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This report also contains:

- CBC Supplement

- LABC Supplement

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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.**	**EVALUATION SUBJECT: SARNAFIL S327, G410, G410 SAM, SIKAPLAN FASTENED AND SIKAPLAN ADHERED SINGLE-PLY ROOFING SYSTEMS**	

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015, 2012, 2009 and 2006 *International Building Code*® (IBC)
- 2021, 2018, 2015, 2012, 2009 and 2006 *International Residential Code*® (IRC)

For evaluation for compliance with codes adopted by *Los Angeles Department of Building and Safety (LADBS)*, see ESR-1157 LABC and LARC Supplement.

Property evaluated:

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

2.0 USES

The Sarnafil S327, G410, G410 SAM, Sikaplan Fastened 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 3.2.9 and Table 2.

3.2.2 Sarnafil S327 Textured Single-Ply Membrane: The Sarnafil S327 Textured membrane is a polyester reinforced PVC membrane complying with ASTM D4434 as Type III. The textured surface is the weather surface. The Sarnafil S327 Textured membrane is manufactured in three thicknesses. See Table 4 for thicknesses and weights of the membranes. The membrane is reinforced with a polyester scrim. Sarnafil S327 Textured membrane is intended for installation over foam plastic insulation when attached with mechanical fasteners described in Section 3.2.9 and Table 2.

3.2.3 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 3.2.10 and Table 3.

3.2.4 Sarnafil G410 Textured Single-Ply Membrane: The Sarnafil G410 Textured membrane, typically used in adhered systems, is a glass fiber-reinforced PVC membrane complying with ASTM D4434 as Type II. The textured surface is the weather surface. The Sarnafil G410 Textured membrane is manufactured in three thicknesses. See Table 4 for thicknesses and weights of the membranes. The fiberglass reinforcement is arranged in a woven mat. Sarnafil G410 Textured membrane is intended for installation over insulation when fully adhered to the substrate using proprietary adhesives as described in Section 3.2.10 and Table 3.

3.2.5 Sarnafil G410 SAM Single-Ply Membrane: The Sarnafil G410 SAM, used in adhered systems**,** is a fiber–reinforced PVC membrane complying with ASTM D4434 as Type II. The Sarnafil G410 SAM is manufactured in three thicknesses. See Table 4 for thickness and weights of the membranes. The fiberglass reinforcement is arranged in a woven mat. The membrane has a pressure sensitive adhesive backing with a release liner. Sarnafil G410 SAM is intended for installation over insulation fully adhered to the substrate as described in Table 3.

3.2.6 Sikaplan Fastened Single-Ply Membrane: The Sikaplan Fastened 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 Sikaplan Fastened membrane 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 Fastened is intended for installation over foam plastic insulation as indicated in Table 1 when attached with mechanical fasteners described in Section 3.2.9 and Table 2.

3.2.7 Sikaplan Adhered Single-Ply Membrane: The Sikaplan Adhered 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 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. 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 3.2.10 and Table 3.

3.2.8 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.

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

3.2.9.1 Sarnafastener #12: The Sarnafastener #12 is used with the Sarnaplate, described in Section 3.2.9.6, 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).

3.2.9.2 Sarnafastener #14: The Sarnafastener #14 is used with the Sarnaplate, described in Section 3.2.9.6, to attach insulation, and with the Sarnadisc XPN, described in Section 3.2.9.9, or the Sarnadisc RhinoBond, described in Section 3.2.9.11, or the Sarnarail Polymer Batten, described in Section 3.2.9.12 to attach the membrane (through the insulation) to combustible or noncombustible roof decks. The Sarnafastener #14 has a shank diameter of 0.190 inch (4.8 mm) and thread diameter of 0.245 inch (6.2 mm).

3.2.9.3 Sikaplan Fastener #14: The Sikaplan Fastener #14 is used with the Sarnaplate, described in Section 3.2.9.6, to attach insulation, and with the Sarnadisc $2^3/_8$, described in Section 3.2.9.8, Sarnadisc XPN, described in Section 3.2.9.9, Sarnadisc RhinoBond, described in Section 3.2.9.11, or Sarnarail Polymer Batten, described in Section 3.2.9.12, to attach the membrane (through the insulation) to combustible or noncombustible roof decks. The Sikaplan Fastener #14 has a shank diameter of 0.190 inch (4.8 mm) and thread diameter of 0.245 inch (6.2 mm).

3.2.9.4 Sarnafastener XP: The Sarnafastener XP is used with the Sarnadisc, described in Section 3.2.9.7, to attach insulation, and with the Sarnadisc XPN, described in Section 3.2.9.9, or the Sarnarail Polymer Batten, described in Section 3.2.9.12, 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).

3.2.9.5 Sarnafastener MAXLoad: The Sarnafastener MAXLoad is used to attach the Sarnafil membrane with the Sarnadisc MAXLoad, described in Section 3.2.9.10, or Sarnarail Polymer Batten, described in Section 3.2.9.12, 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).

3.2.9.6 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.

3.2.9.7 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.

3.2.9.8 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.

3.2.9.9 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.

3.2.9.10 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.

3.2.9.11 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.

3.2.9.12 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 3.2.9.4 or 3.2.9.5, respectively, for securing the roof membrane.

3.2.10 Adhesives:

3.2.10.1 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).

3.2.10.2 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).

3.2.10.3 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).

3.2.10.4 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 (600mL) 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).

3.2.10.5 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).

3.2.10.6 Sarnacol AD Board Adhesive: Sarnacol AD 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 45°F and 95°F (7°C and 35°C).

3.2.10.7 Sarnacol 2163 Adhesive: Sarnacol 2163 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. The shelf life is 18 months when the adhesive is stored in the original unopened container at temperatures not exceeding 90°F (32°C).

3.2.11 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, G410 SAM, Sikaplan Fastened 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 or 2017 edition, as applicable, of ANSI/SPRI/FM 4435 ES-1, and designed and installed for wind loads in accordance with 2021 IBC Section 1504.6 or 2018 and 2015 IBC Section 1504.5, as applicable, and 2021, 2018 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 2021, 2018 and 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, G410 SAM, Sikaplan Fastened 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, G410 SAM, Sikaplan Fastened 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, 2018, 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 Fastened 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, G410 SAM, Sikaplan Fastened 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 April 2021)

7.0 IDENTIFICATION

7.1 The Sarnafil S327, G410, G410 SAM, Sikaplan Fastened 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).

7.2 The report holder's contact information is the following:

SIKA SARNAFIL, INC.
100 DAN ROAD
CANTON, MASSACHUSETTS 02021
(781) 332-3224
www.usa.sarnafil.sika.com

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	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
11	A	Noncombustible	5:12	(Optional), One or more layers of polyisocyanurate or polystyrene or combination	Minimum ¼-inch SECUROCK Gypsum Fiber Roof Board	Mechanically attached	Sarnafil G410 SAM	Self Adhered
12	A	Noncombustible	1:12	Atlas Roofing ACFoam II or III, Hunter Panels H-Shield, Johns-Manville ENERGY 3, Rmax Multi-Max FA-3, Sarnatherm Insulation Boards	(Optional) Minimum ¼-inch DensDeck Roof Board	Mechanically attached	Sarnafil G410 SAM	Self Adhered

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 FASTENED AND SARNAFIL S327 MECHANICALLY ATTACHED ROOFING MEMBRANES ALLOWABLE WIND UPLIFT[7]

SYSTEM NO.	SUBSTRATE[6]	INSULATION[2, 3]		SARNAFIL AND SIKAPLAN FASTENED PVC MEMBRANE[7]					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	53
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 insulation board	Presecured	Sarnafastener XP and Sarnadisc $2^3/_8$	5.5	1.75	54.5	12	45

TABLE 2—SIKAPLAN FASTENED AND SARNAFIL S327 MECHANICALLY ATTACHED ROOFING MEMBRANES ALLOWABLE WIND UPLIFT[7] (Continued)

SYSTEM NO.	SUBSTRATE[6]	INSULATION[2, 3]		SARNAFIL AND SIKAPLAN FASTENED PVC MEMBRANE[7]					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)	
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
17	15/32-inch plywood	1/4-inch thick DensDeck Prime, (Optional) One or more layers of polyisocyanurate, min. 1.3 inches thick Sarnatherm insulation board	Presecured	Sikaplan #14 and Sikaplan Disc	5.5	1.5	114.5	6	38
18	15/32-inch plywood	1/4-inch thick DensDeck Prime, (Optional) One or more layers of polyisocyanurate, min. 1.3 inches thick Sarnatherm insulation board	Presecured	Sikaplan #14 and Sikaplan Disc	5.5	1.5	114.5	9	30
19	15/32-inch plywood	1/4-inch thick DensDeck Prime, (Optional) One or more layers of polyisocyanurate, min. 1.3 inches thick Sarnatherm insulation board	Loose Laid	Sarnafastener #14 and Sarnadisc Rhinobond	3	1.5	24	24	38
20	15/32-inch plywood	1/4-inch thick DensDeck Prime, (Optional) One or more layers of polyisocyanurate, min. 1.3 inches thick Sarnatherm insulation board	Presecured	Sikaplan #14 and Sikaplan Disc	5.5	1.5	54.5	6	75
21	15/32-inch plywood	1/4-inch thick DensDeck Prime, (Optional) One or more layers of polyisocyanurate, min. 1.3 inches thick Sarnatherm insulation board	Presecured	Sikaplan #14 and Sikaplan Disc	5.5	1.5	54.5	12	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 Fastened membrane as described in Section 3.2.6 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.	53
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.	233
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.	233
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 0.5-inch wide ribbons at 12" o.c.	120
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

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

SYSTEM NO.	SUBSTRATE	INSULATION[2,3]		COVERBOARD		SARNAFIL PVC MEMBRANE	ALLOWABLE WIND UPLIFT CAPACITY (PSF)
		Type	Attachment	Type	Attachment		
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
10	Steel, min 22 gage	Polyisocyanurate, Rmax Multi-Max FA, tapered Thermaroof FA-3 Ultra-Max, Atlas ACFoam II, AC Foam III, AC Foam III Tapered, Hunter Panels H-Shield, H-Shield CG, H-Shield CG Tapered, Sarnatherm, Sarnatherm CG, Sarnatherm a, Sarnatherm a CG, Sarnather r, Sarnatherm r CG	Sarnafasteners and Sarnaplates at 1 fastener per 2 sq. ft.	Sarnatherm Roofboard H, Sarnatherm Roofboard A-III, Securock Glass-mat Roof Board, Dens Deck Prime, DEXcell AF Glass Mat Roof Board	Adhered with Sanacol OM or Sarnacol AD adhesive applied to the board with 0.5" wide ribbons at 12" o.c.	G410 SAM self-adhered to the cover board	45
11	Concrete[1]	Polyisocyanurate, Rmax Multi-Max FA, tapered Thermaroof FA-3 Ultra-Max, Atlas ACFoam II, AC Foam III, AC Foam III Tapered, Hunter Panels H-Shield, H-Shield CG, H-Shield CG Tapered, Sarnatherm, Sarnatherm CG, Sarnatherm a, Sarnatherm a CG, Sarnather r, Sarnatherm r CG	Adhered with Sanacol OM adhesive applied to the board with 0.5” wide ribbons at 12” o.c.	Sarnatherm Roofboard H, Sarnatherm Roofboard A-III, Securock Glass-mat Roof Board, Dens Deck Prime	Adhered with Sanacol OM adhesive applied to the board with 0.5" wide ribbons at 12" o.c.	G410 SAM self-adhered to the cover board	83
12	Concrete[1]	Polyisocyanurate, Rmax Multi-Max FA, tapered Thermaroof FA-3 Ultra-Max, Atlas ACFoam II, AC Foam III, AC Foam III Tapered, Hunter Panels H-Shield, H-Shield CG, H-Shield CG Tapered, Sarnatherm, Sarnatherm CG, Sarnatherm a, Sarnatherm a CG, Sarnather r, Sarnatherm r CG	Adhered with Sanacol OM adhesive applied to the board with 0.5” wide ribbons at 12” o.c.	Sarnatherm Roofboard A-III, ACFoam III HD Coverboard, Dens Deck Prime, DEXcell FA Glass Mat Roof Board, DEXcell Glass Mat Roof Board	Adhered with Sanacol OM adhesive applied to the board with 0.5" wide ribbons at 12" o.c.	G410 SAM self-adhered to the cover board	90

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

SYSTEM NO.	SUBSTRATE	INSULATION[2,3]		COVERBOARD		SARNAFIL PVC MEMBRANE	ALLOWABLE WIND UPLIFT CAPACITY (PSF)
		Type	Attachment	Type	Attachment		
13	Poured Gypsum over Concrete	Sarnatherm and Sarnatherm a	Adhered with Sarnacol 2163 or Sarnacol AD Board Adhesive, applied with 0.5" wide ribbons at 12" o.c.	Minimum 0.25-inch DensDeck Prime	Adhered with Sarnacol 2163 or Sarnacol AD Board Adhesive, applied with 0.5" wide ribbons at 12" o.c.	G410, S327 membrane or Sikaplan Adhered membrane adhered to the cover board with Sarnacol 2170 or Sarnacol 2170 VC adhesive applied to the membrane backside at 0.75 gal/100 sq.ft. and cover board at 0.75 gal./100 sq. ft. or Sarnacol 2121 applied to cover board at 0.75 gal./100 sq.ft. G410 Feltback, S327 Feltback or Sikaplan Adhered Feltback adhered to the cover board with Sarnacol 2170 or Sarnacol 2170VC applied in two coats to the cover board at a total application rate of 2 gal/100 sq. ft., or Sarnacol 2121 adhesive applied to the cover board at 2.0 gal/100 sq. ft.	257.5

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
G410 SAM	60	0.059	NA	0.445
G410 SAM	72	0.071	NA	0.533
G410 SAM	80	0.079	NA	0.595
G410 Textured, S327 Textured	60	0.059	NA	0.390
G410 Textured, S327 Textured	72	0.072	NA	0.467
G410 Textured, S327 Textured	80	0.079	NA	0.562
Sikaplan Fastened 45, Sikaplan Adhered 45	45	0.045	0.341	0.278
Sikaplan Fastened 60, Sikaplan Adhered 60	60	0.054	0.411	0.348

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

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.

EVALUATION SUBJECT:

SARNAFIL S327, G410, G410 SAM, SIKAPLAN FASTENED AND SIKAPLAN ADHERED SINGLE-PLY ROOFING SYSTEMS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Sarnafil S327, G410, G410 SAM, Sikaplan Fastened and Sikaplan Adhered Single-Ply Roofing Systems, described in ICC-ES evaluation report ESR-1157, have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2020 *City of Los Angeles Building Code* (LABC)
- 2020 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The Sarnafil S327, G410, G410 SAM, Sikaplan Fastened and Sikaplan Adhered Single-Ply Roofing Systems, described in Sections 2.0 through 7.0 of the evaluation report ESR-1157, comply with the LABC Chapter 15 and LARC Chapter 9, and are subjected to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Sarnafil S327, G410, G410 SAM, Sikaplan Fastened and Sikaplan Adhered Single-Ply Roofing Systems, described in this evaluation report must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-1157.
- The design, installation, conditions of use and identification are in accordance with the 2018 *International Building Code*® (IBC) and 2018 *International Residential Code*® (IRC) provisions noted in the evaluation report ESR-1157.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17 or LARC Chapter 3, as applicable.
- The Sarnafil S327, G410, G410 SAM, Sikaplan Fastened and Sikaplan Adhered Single-Ply Roofing Systems must not be installed over existing wood shakes or wood shingles in accordance with LABC Section 1511.
- The installation of the Sarnafil S327, G410, G410 SAM, Sikaplan Fastened and Sikaplan Adhered Single-Ply Roofing Systems must comply with City of Los Angeles Information Bulletin P/BC 2020-16, “Dwellings in High Wind Velocity Areas (HWA)”.
- Reroofing applications must comply with Sections 4.5 of the evaluation report ESR-1157 and LABC Section 1511 or LARC Section R908, as applicable. Where spaced sheathing exists, a minimum of $^{15}/_{32}$-inch-thick (11.9 mm) plywood shall be installed prior to roofing installations.
- Where moderate or heavy foot traffic occurs for maintenance of equipment, the roof covering shall be adequately protected.
- The Building Inspector shall be notified 24 hours in advance prior to installation of the roof membranes.

This supplement expires concurrently with the evaluation report, reissued September 2023.

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.

EVALUATION SUBJECT:

SARNAFIL S327, G410, G410 SAM, SIKAPLAN FASTENED AND SIKAPLAN ADHERED SINGLE-PLY ROOFING SYSTEMS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Sarnafil S327, G410, G410 SAM, Sikaplan Fastened and Sikaplan Adhered Single-Ply Roofing Systems, described in ICC-ES evaluation report ESR-1157, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2019 *California Building Code* (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2019 *California Residential Code* (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The Sarnafil S327, G410, G410 SAM, Sikaplan Fastened and Sikaplan Adhered Single-Ply Roofing Systems, described in Sections 2.0 through 7.0 of the evaluation report ESR-1157, comply with CBC Chapter 15, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 15, 16 and 26, as applicable.

2.1.1 OSHPD: The applicable OSHPD Sections of the CBC are beyond the scope of this supplement.

2.1.2 DSA: The applicable DSA Sections of the CBC are beyond the scope of this supplement.

2.2 CRC:

The Sarnafil S327, G410, G410 SAM, Sikaplan Fastened and Sikaplan Adhered Single-Ply Roofing Systems, described in Sections 2.0 through 7.0 of the evaluation report ESR-1157, comply with CRC Chapter 9, provided the design and installation are in accordance with the 2018 *International Residential Code*® (IRC) provisions noted in the evaluation report and the additional requirements of CRC Chapter 9, as applicable

This supplement expires concurrently with the evaluation report, reissued September 2023.