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Legacy report on the 1997 Uniform Building Code™, the 2000 International Building Code® and the 2000 International Residential Code®

DIVISION: 07—THERMAL AND MOISTURE PROTECTION
Section: 07550—Modified Bituminous Sheet Roofing

ELASTOFLEX SA, POLYFLEX, AND POLYFLEX SA MODIFIED BITUMEN ROOFING SYSTEMS

POLYGLASS USA, INC.
150 LYON DRIVE
FERNLEY, NEVADA 89408-9901

MULE-HIDE PRODUCTS CO., INC.
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1.0 SUBJECT

Elastoflex SA, Polyflex, and Polyflex SA Modified Bitumen Roofing Systems.

2.0 DESCRIPTION

2.1 General:

The Elastoflex SA, Polyflex, and Polyflex SA membranes are roofing membranes consisting of bitumen modifiers and reinforcements. The membranes are installed in accordance with this report over combustible and noncombustible decks that may be insulated or uninsulated. See Table 1 for roof membrane trade names, Table 2 for classification requirements, and Table 3 for installation requirements.

2.2 Materials:

2.2.1 Roof Substrate: Noncombustible decks consist of either steel, lightweight concrete (cellular, gypsum, vermiculite, or perlite), or structural concrete. The steel deck shall be minimum No. 22 gage steel [base-metal thickness of 0.0273 inch (0.69 mm)] having a minimum yield strength, Fy, of 33 ksi (227 MPa) or 80 ksi (550 MPa), depending on the wind uplift capacity of the roof assemblies shown in Table 2.

Combustible decks consist of Exposure 1 plywood or oriented strand board (OSB), having a minimum 15/32-inch (11.9 mm) or 3/4-inch (19.0 mm) thickness, depending on the wind uplift capacity of the roof assemblies shown in Table 2. The plywood or OSB shall comply with Section 2602.5.3 of the 1997 Uniform Building Code™ (UBC), Section 2603.4.1.5 of the 2000 International Building Code® (IBC) or Section R803.2.12 of the 2000 International Residential Code® (IRC).

2.2.2 Base Sheet: Unless otherwise stated in Tables 2 or 3, the base sheet shall be either Polyglass Elastobase, a

modified bituminous base sheet with a glass-fiber mat; or any ASTM D 4601, type II, base sheet. The base sheet shall be approved for use by Polyglass USA, Inc., and the building official.

2.2.3 Roofing Membranes:

2.2.3.1 Elastoflex SA (Self-adhered) Membranes:

Elastoflex SA V Base, Elastoflex SA V Base FR, Elastoflex SA Vent, and Elastoflex SA Vent FR comply with ASTM D 6163, Type I, and are modified bitumen membranes utilizing an SBS (styrene butadiene styrene) modified compound on the top, a self-adhesive compound on the bottom, and a fiberglass reinforcement. Elastoflex SA V Base, Elastoflex SA V Base FR, Elastoflex SA Vent, and Elastoflex SA Vent FR are Grade S (smooth surface) products that are finished on the top surface with a polyolefin film, and have a nominal 80-mil (2.0 mm) thickness. All Elastoflex SA V products are finished on the bottom surface with a split/perforated release film, which protects the underside adhesive compound and is removed during installation. Nominal weight of the membranes per 100 square feet (9.3 m²) of coverage is 49 pounds (22.2 kg). Roll size is 65.67 feet by 3.28 feet (20 m by 1 m).

Elastoflex SA P, Elastoflex SA P G, and Elastoflex SA P G FR comply with ASTM D 6164, Type I, and are modified bitumen membranes utilizing an SBS (styrene butadiene styrene) modified compound on the top, a self-adhesive compound on the bottom, and a polyester reinforcement. Elastoflex SA P is a Grade S (smooth surface) product that is finished on the top surface with a polyolefin film, and has a nominal 116-mil (2.9 mm) thickness. Elastoflex SA P G and Elastoflex SA P G FR are Grade G (granule surface) products that are finished on the top surface with mineral granules, and have a nominal 130-mil (3.3 mm) thickness. All Elastoflex SA P membrane products are finished on the bottom surface with a split/perforated release film, which protects the underside adhesive compound and is removed during installation. Nominal weight of the membrane per 100 square feet (9.3 m²) of coverage is 82 pounds (37.2 kg) for Grade S products and 95 pounds (43.0 kg) for Grade G products. Roll size is 32.80 feet by 3.28 feet (9958 mm by 1000 mm).

2.2.3.2 Polyflex Membranes:

Polyflex, Polyflex G, and Polyflex G FR comply with ASTM D 6222, Type I, and are modified bitumen membranes utilizing APP (atactic polypropylene) as the modifier and polyester as the reinforcement. Material thickness is nominally 157 mils (4.0 mm) for Polyflex and 177 mils (4.5 mm) for Polyflex G and Polyflex G FR. For Polyflex G and Polyflex G FR, the top

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surface is coated with mineral granules, and for Polyflex it is smooth; the bottom surface of both membranes is burn-off polyethylene. Nominal weight of the membrane per 100 square feet (9.3 m²) of coverage is 90 pounds (40.5 kg) for Polyflex, 105 pounds (47.25 kg) for Polyflex G, and 110 pounds (49.5 kg) for Polyflex G FR. Roll size is 32.67 feet by 3.28 feet (9958 mm by 1000 mm).

2.2.3.3 Polyflex SA (Self-adhered) Membranes: Polyflex SA P, Polyflex SA P G, and Polyflex SA P G FR comply with ASTM D 6222, Type I, and are modified bitumen membranes utilizing an APP (atactic polypropylene) modified compound on the top, a self-adhesive compound on the bottom, and a polyester reinforcement. Polyflex SA P is a Grade S (smooth surface) product that is finished on the top surface with a polyolefin film, and has a nominal 140-mil (3.5 mm) thickness. Polyflex SA P G and Polyflex SA P G FR are Grade G (granule surface) products that are finished on the top surface with mineral granules, and have a nominal 140-mil (3.5 mm) thickness. All Polyflex SA P products are finished on the bottom surface with a split/perforated release film, which protects the underside adhesive compound and is removed during installation. Nominal weight of the membrane per 100 square feet (9.3 m²) of coverage is 90 pounds (40.8 kg) for Grade S products and 95 pounds (43.0 kg) for Grade G products. Roll size is 32.80 feet by 3.28 feet (9958 mm by 1000 mm).

2.2.4 Insulation: Nonclassified roof assemblies are permitted to include minimum 1-inch-thick (25.4 mm) approved wood fiber roof insulation, 1⁵/₈-inch-thick (41 mm) fiberglass roof insulation, 1-inch-thick (25.4 mm) approved perlite roof insulation, or 1¹/₂-inch-thick (38 mm) approved isocyanurate roof insulation, provided that the thermal barrier requirements of UBC Sections 2602.4 and 2602.5.3, IBC Section 2603.4, or IRC Section R318.2.3, as applicable, are met.

Classified roofing systems applied to a noncombustible or combustible deck are permitted to have approved insulation in accordance with Table 2.

Polyisocyanurate foam plastic insulation specified in Table 2 shall comply with ASTM C 1289 and Chapter 26 of the UBC or IBC. Foam plastic insulation shall be either recognized in a current ICC-ES evaluation report or justified to the satisfaction of the building official as complying with the labeling and identification, surface-burning characteristics, and thermal barrier requirements of UBC Section 2602.5.3 or IBC Section 2603, as applicable; and shall be approved by FM Approvals and classified by Underwriters Laboratories Inc. for roofing applications.

When foam plastic insulation is installed directly over a steel deck, the roof assembly, which includes the foam plastic insulation and the Polyglass roofing membrane, shall be listed for compliance with a test for insulated roof decks, such as FM 4450 (Approval Standard for Class I Insulated Steel Deck Roofs), FM 4470 (Approval Standard for Class 1 Roof Covers), UL 1256 (Fire Test for Roof Deck Construction) or the ICC-ES Interim Criteria for Foam Plastic Insulation Applied Directly to Steel Decks (AC142); unless a thermal barrier, as outlined in UBC Section 2602.5.3, IBC Section 2603.4, or IRC Section R318.1.2, as applicable, is installed.

2.2.5 Asphalt Primer: The asphalt primer shall meet ASTM D 41 specifications.

2.2.6 Asphalt: The asphalt shall meet ASTM D 312-95a, Type III or IV, specifications. Labels on the asphalt containers shall identify the equiviscous temperature, the finished blowing temperature, and the flash point.

2.2.7 Mechanical Fasteners: Recognized fasteners and plates are described in Sections 2.2.7.1 through 2.2.7.9 of

this report. The length of fasteners varies and shall be sufficient for the fastener to protrude through steel and wood decks a minimum of ³/₈ inch (9.5 mm). For concrete decks, ³/₁₆-inch-diameter (5 mm) holes shall be predrilled and at least 1 inch (25.4 mm), but not more than 1¹/₂ inches (38 mm), of the screw shall penetrate into the concrete deck.

2.2.7.1 Dekfast #12 and Polygrip #12: These are corrosion-resistant, Sentri-coated, carbon steel, self-drilling screws with a 0.222-inch (5.6 mm) major thread diameter, 0.167-inch (4.2 mm) shank diameter, 0.448-inch (11.3 mm) head diameter and a No. 3 Phillips recess or ¹/₄-inch (6.4 mm) hex head, for installation in wood and steel decks and use with Dekfast Hex Plates, Polygrip Hex Plates, IF/IG-70x70 plates or IF-50 plates.

2.2.7.2 Dekfast #14 and Polygrip #14: These are corrosion-resistant, Sentri-coated, carbon steel, self-drilling screws with a 0.238-inch (6.0 mm) major thread diameter, 0.181-inch (4.6 mm) shank diameter, 0.448-inch (11.3 mm) head diameter and a No. 3 Phillips recess, for installation in wood, steel and structural concrete decks and use with Dekfast Hex Plates, Polygrip Hex Plates, Dekfast 2¹/₂-inch HS Membrane Plates, Polygrip 2¹/₂-inch HS Membrane Plates, IF/IG-70x70 plates or IF-50 plates.

2.2.7.3 Dekfast #15 HS and Polygrip #15: These are corrosion-resistant, Sentri-coated, carbon steel, self-drilling screws with a 0.263-inch (6.7 mm) major thread diameter, 0.204-inch (5.2 mm) shank diameter, 0.448-inch (11.3 mm) head diameter and a No. 3 Phillips recess, for installation in steel and structural concrete decks and use with Dekfast 2¹/₂-inch HS Membrane Plates or Polygrip 2¹/₂-inch HS Membrane Plates.

2.2.7.4 Isofast IF2: These are corrosion-resistant, coated, carbon steel, self-drilling screws with a 0.210-inch (5.5 mm) major thread diameter, 0.153-inch (3.9 mm) shank diameter, 0.448-inch (11.3 mm) head diameter and a No. 3 Phillips recess, for installation in wood and steel decks and use with IF/IG-70x70 plates.

2.2.7.5 ITW Buildex Lite Weight Concrete Fasteners: These are 1.75-inch-long-by-1.1-inch-wide (44.5 mm by 28 mm), painted G90 steel fasteners with an integral 2.7-inch-diameter (68.8 mm) AZ55 Galvalume plate designed for use in lightweight concrete decks.

2.2.7.6 Dekfast Hex and Polygrip Hex Plates: These are 2⁷/₈-inch-by-3¹/₃-inch (73 mm by 83 mm), 0.018-inch-thick (0.46 mm) hexagonal steel, and have an AZ-50 Galvalume coating complying with ASTM A 792-95.

2.2.7.7 Dekfast 2¹/₂" HS and Polygrip 2¹/₂" HS Membrane Plates: These are 2¹/₂-inch-diameter (64 mm), 0.036-inch-thick (0.9 mm) steel, and have an AZ-50 Galvalume coating complying with ASTM A 792-95.

2.2.7.8 IF/IC 70x70 Plates: These are 2³/₄-inch-by-2³/₄-inch (70 mm by 70 mm), 0.042-inch-thick (1.1 mm) steel, and have an AZ50 Galvalume coating complying with ASTM A 792-95.

2.2.7.9 IF-50 Plates: These are 2-inch-diameter (51 mm) nylon with 16 barbs on the underside.

2.3 Installation:

The roof deck or existing roof surface shall be clean, dry and free of sharp protrusions, oil and grease. The deck shall provide continuous support for the roofing system and provide adequate structural strength required by the code. The final roof surface shall provide positive slope to drain in accordance with Section 1506 of the UBC, Section 1507.11.1 of the IBC or Section R903.4 of the IRC.

For uninsulated roofing systems, an approved asphalt primer shall be used to coat the roof decking substrate in accordance with the manufacturer's instructions. The base ply in insulated or uninsulated roofing systems either is fully adhered to the deck or to the existing roof surface with hot asphalt applied at a rate of 25 pounds per 100 square feet (1.25 kg/m²), is mechanically attached to the deck using fasteners and plates, or is self-adhered. The base sheet requires minimum 4-inch-wide (102 mm) laps at all seams.

Elastoflex SA and Polyflex SA products, described in Sections 2.2.3.1 and 2.2.3.3, respectively, are self-adhered to the insulation or base ply. Polyflex membranes, described in Section 2.2.3.2, are torch-applied to the base ply.

All membrane side laps are a minimum of 3 inches (76 mm), and head laps are a minimum of 6 inches (152 mm). Parapets, roof edges, vents, pipes and other penetrations through the roof are flashed in accordance with the manufacturer's instructions. See Figure 1 for typical details.

2.4 Fire Classified Roofing Systems:

The assemblies described in Table 2, except Elastoflex SA or Polyflex SA systems, have a Class A roof classification when installed over noncombustible decks at a maximum slope of 1/2:12 (4%). If Polyflex or Polyflex G is the top membrane, a coating application of Karnak #97 at 1.5 gallons (5.7 L) per square is required for the 1/2:12 sloped Class A rating. Membranes having the "FR" designation (fire-rated sheets) require no coating. For combustible decks, slopes in excess of these maximums, or Elastoflex SA or Polyflex SA systems, refer to Table 2.

2.5 Wind-uplift Resistance:

Mechanically attached and fully adhered roof assemblies described in this report provide resistance to wind pressures associated with basic wind speeds (fastest mile and 3-second gust) and building exposures as described in Table 3, when the maximum building height is 40 feet (12.2 m).

For mechanically attached insulation or base sheets, the tabulated fastener spacing and allowable locations are based on the field of the roof. The insulation or base sheet located at the roof perimeter and corners shall have double the number of fasteners specified in Table 3.

For adhered insulations and base sheets, the tabulated allowable locations are based on the wind pressures at the roof perimeter and roof corner areas.

2.6 Identification:

Roofing components bear a label noting the product name (refer to Table 1); the manufacturer's name (Polyglass USA, Inc.) or the name of the additional listee (Mule-Hide Products Co., Inc.); and the evaluation report number (ER-5494); together with a label issued by the inspection agency (Factory

Mutual Research Corporation and Underwriters Laboratories Inc.).

Fasteners are identified by the manufacturer's name, the trade name and the size.

Foam plastic insulation shall be labeled in accordance with the applicable ICC-ES evaluation report or in accordance with UBC Section 2602.2 or IBC Section 2603.2. All other roofing components shall bear a label noting the manufacturer's name and the product name; and a label of Underwriters Laboratories Inc., showing classification established in accordance with ASTM E 108 (UL Standard 790).

When foam plastic insulation is installed directly over a steel deck, the roof assembly, which includes the foam plastic insulation and the Polyglass roofing membrane, shall be listed for compliance with a test for insulated roof decks, such as FM 4450 (Approval Standard for Class I Insulated Steel Deck Roofs) or UL 1256 (Fire Test for Roof Deck Construction) or the ICC-ES Interim Criteria for Foam Plastic Insulation Applied Directly to Steel Decks (AC142).

3.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Membrane Roof-covering Systems (AC75), dated June 2003; and a quality control manual.

4.0 FINDINGS

That the Elastoflex SA, Polyflex, and Polyflex SA Modified Bitumen Roofing Systems described in this report comply with the 1997 *Uniform Building Code*TM, the 2000 *International Building Code*[®] and the 2000 *International Residential Code*[®], subject to the following conditions:

- 4.1 The roof covering system is installed by applicators approved by Polyglass USA, Inc.
- 4.2 The materials and installation comply with this report and the manufacturer's instructions.
- 4.3 Where moderate or heavy traffic occurs, such as for maintenance of equipment, the roof covering is protected to prevent rupture or wearing of the surface.
- 4.4 Roof classification requirements in Table 2 and installation requirements in Table 3 are followed.
- 4.5 The membranes are manufactured in Fernley, Nevada, and Hazelton, Pennsylvania, under a quality control program with inspections by Factory Mutual Research Corporation (AA-653) and Underwriters Laboratories Inc. (AA-668).

This report is subject to re-examination in two years.

TABLE 1—PRODUCT TRADE NAMES

POLYGLASS USA	MULE-HIDE PRODUCTS CO., INC.
Elastoflex SA V Base	Mule-Hide SA-SBS Base Sheet
Elastoflex SA V Base FR	Mule-Hide SA-SBS Base Sheet (FR)
Elastoflex SA Vent	Mule-Hide SA-Vented Base Sheet
Elastoflex SA Vent FR	Mule-Hide SA-Vented Base Sheet (FR)
Elastoflex SA P Smooth	Not listed
Elastoflex SA P G	Mule-Hide SA-SBS Cap Sheet
Elastoflex SA P G FR	Mule-Hide SA-SBS Cap Sheet (FR)
Polyflex	Not listed
Polyflex G	Not listed
Polyflex G FR	Not listed
Polyflex SA P Smooth	Mule-Hide SA-APP Cap Sheet (smooth)
Polyflex SA P G	Mule-Hide SA-APP Cap Sheet
Polyflex SA P G FR	Mule-Hide SA-APP Cap Sheet (FR)

TABLE 2—POLYGLASS ROOFING SYSTEMS, EXTERNAL FIRE RESISTANCE CLASSIFICATIONS

SYS-TEM NO.	ROOF CLASSIFI-CATION ^{1,2}	SUB-STRATE ^{3,4,5}	MAX. SLOPE	INSULATION ⁶ /BARRIER BOARDS			ROOF COVERING APPLICATION			WIND CLAS-SIFICATION REFERENCE (See Table 3)
				Barrier Board	Insulation/ Thickness	Attachment	Base Sheet or Slip Sheet	Ply Sheet	Membrane	
1	A	Noncom-bustible ²	1/2:12	None	Any thickness, polyiso-cyanurate, urethane, per-lite/polyisocyanurate composite, perlite/ure-thane composite, glass fiber, wood fiberboard, or perlite	Mechanically attached or loose	Elastobase or type G2, me-chanically at-tached	(Optional) One or more plies of Polyglass Ply 4 or Ply 6, applied in hot asphalt	Polyflex or Polyflex G, torch-applied. Surface with Kokem "Sunguard Acrylic Roof Coating" at 1 gal./sq., or Karnak No. 97 Fibrated Alumi-num Asphalt Roof Coat-ing, or Karnak No. 97 Asbestos Free Alumi-num Roof Coating at 1 to 2 gal./sq., or Elastoflex VG FR, applied in hot asphalt or torch-applied (no surfacing)	2
2	A	Combust-ible (plywood ³)	1/2:12	None	Any thickness, 2 or more layers (joints stag-gered from plywood joints) polyisocyanurate, urethane, perlite/polyiso-cyanurate composite, perlite/urethane composite, glass fiber, or perlite	Mechanically attached or loose	Elastobase or type G2, me-chanically at-tached	None	Polyflex or Polyflex G, torch-applied. Surface with Kokem "Sunguard Acrylic Roof Coating" at 1 gal./sq., or Karnak No. 97 Fibrated Aluminum Asphalt Roof Coating, or Karnak No. 97 Asbestos Free Aluminum Roof Coating at 1 to 2 gal./sq.	2
3	A	Combust-ible (plywood ³)	1:12	1/2" Dens-Deck ⁷	1" thick perlite, wood fiberboard or glass fiber	Mechanically attached or loose	Elastobase or type G2, me-chanically at-tached or ap-plied in hot as-phalt	None	Polyflex or Polyflex G, torch-applied. Surface with Monsey "Endure Aluminum Roof Coating," "Weather Check" or "Pro-Grade Aluminum Roof Coating" at 1.5 gal./sq. or Karnak No. 97 Fibrated Aluminum Asphalt Roof Coating or Karnak No. 97 Asbestos Free Aluminum Roof Coating at 1 to 2 gal./sq.	2
4	A	Noncom-bustible ²	1:12	None	(Optional) Any thickness, polyisocyanurate, glass fiber, perlite, wood fiber, any combination	Mechanically attached or applied in hot asphalt	Elastobase or type G2, me-chanically at-tached or ap-plied in hot asphalt	(Optional) One or more plies of Polyglass Ply 4 or Ply 6, applied in hot asphalt	Polyflex or Polyflex G, torch-applied. Surface with Grundy Industries "a1 MB Aluminum Roof Coating" at 1-2 gal./sq.	1, 2, 10
5	A	Noncom-bustible ²	1:12	None	Any thickness, polyiso-cyanurate, urethane, per-lite/polyisocyanurate composite, perlite/ure-thane composite, glass fiber, or perlite	Mechanically attached	Elastobase or type G2, me-chanically at-tached	(Optional) One or more plies of Polyglass Ply 4 or Ply 6, applied in hot asphalt	Polyflex G FR, torch-applied	2
6	A	Combust-ible (plywood ³)	1/2:12	None	None	N/A	One or more layers Elastobase or type G2, mechanical-ly attached or applied in hot asphalt	One or more layers Elastobase or type G2, mechanical-ly attached or applied in hot asphalt	Polyflex G FR, torch-applied	5
7	A	Combust-ible (plywood ³)	1/2:12	None	Min. 2" thick polyisocya-nurate, min. 3/4" thick perlite, min. 7/16" thick glass fiber, min. 2" thick perlite/polyiso or perlite/urethane composite, or min. 2" thick polyiso covered with min. 1/2" thick wood fiberboard	Mechanically at-tached	Elastobase or type G2, mechanical-ly attached or applied in hot asphalt	Elastobase or type G2, me-chanically at-tached or ap-plied in hot as-phalt	Polyflex G FR, torch-applied	1, 2

TABLE 2—POLYGLASS ROOFING SYSTEMS, EXTERNAL FIRE RESISTANCE CLASSIFICATIONS—(Continued)

SYS-TEM NO.	ROOF CLASSIFI-CATION ^{1,2}	SUB-STRATE ^{3,4,5}	MAX. SLOPE	INSULATION ⁶ /BARRIER BOARDS			ROOF COVERING APPLICATION			WIND CLAS-SIFICATION REFERENCE (See Table 3)
				Barrier Board	Insulation/ Thickness	Attachment	Base Sheet or Slip Sheet	Ply Sheet	Membrane	
8	A	Noncom-bustible ² (excluding steel)	1:12	None	None	N/A	None	(Optional) One or more plies of Polyglass Ply 4 or Ply 6, applied in hot asphalt	Deck shall be primed with asphalt primer followed by Polyflex or Polyflex G, torch-applied. Surface with Monsey "Endure Aluminum Roof Coating" at 1.5 gal./sq. or Grundy Industries "a1 MB Aluminum Roof Coating" at 1-2 gal./sq. or Polyflex G FR, torch applied (no surfacing)	8, 9
9	A	Noncom-bustible ² (excluding steel)	1:12	None	Any thickness, one or more layers perlite, wood fiber, glass fiber, polyiso-cyanurate, polyiso composite, EPS/wood fiber composite, or EPS/perlite composite	Mechanically attached	One or more layers Elastobase or type G2, mechanically attached or applied in hot asphalt	(Optional) One or more plies of Polyglass Ply 4 or Ply 6, applied in hot asphalt	Polyflex or Polyflex G, torch-applied. Surface with Fields "F530 Heat Shield Aluminum Coating" or "F630 Heat Shield Fibered Aluminum Coating" at 1 1/2 gal./sq.	1, 2
10	A	Combustible (plywood ³)	2 1/2:12	1/4" thick Dens Deck ⁷	(Optional) Any thickness polyisocyanurate, perlite, wood fiber, or polyisocya-nurate/perlite composite	Mechanically attached	Elastobase or type G2, mechanically attached	None	Polyflex G FR, torch-applied	2, 5
11	A	Noncom-bustible ²	1/2:12	None	(Optional) Any thickness, polyisocyanurate, glass fiber, perlite, wood fiber, any combination	Mechanically attached or applied in hot asphalt	Elastobase or type G2 mechanically attached or applied in hot asphalt	(Optional) One or more plies of Polyglass Ply 4 or Ply 6, applied in hot asphalt	Polyflex, torch-applied. Surfaced with "300 AFX" Aluminum Roof Coating at 1 1/2 gal./sq.	1, 2, 10
12	B	Combustible (plywood ³)	1/2:12	None	(Optional) Any thickness, one or more layers perlite, wood fiber, glass fiber, polyisocyanurate, polyiso composite, EPS/ wood fiber composite or EPS/perlite composite	Mechanically attached	One or more layers Elastobase or type G2, mechanically attached or applied in hot asphalt	None	Polyflex or Polyflex G, torch-applied. Surface with Fields "F530 Heat Shield Aluminum Coating" or "F630 Heat Shield Fibered Aluminum Coating" at 1 1/2 gal./sq., or Monsey "Endure Aluminum Roof Coating," "Weather Check" or "Pro-Grade Aluminum Roof Coating" at 1.5 gal./sq.	1,2
13	A	Combustible (plywood)	2:12	Min. 1/4" Dens-Deck ⁷	(Optional) Any thickness, polyisocyanurate, perlite, wood fiber or polyiso/perlite composite	Mechanically attached	Elastobase (poly/sand) mechanically attached; or Elastoflex SA V FR Base or SA Vent FR, self-adhered	(Optional) Elastoflex SA V FR Base, self-adhered	Polyflex SA P FR, Elastoflex SA P FR, Elastoflex SA V FR self-adhered, or Polyflex G FR	13
14	A	Combustible (plywood)	1/2:12	None	None	N/A	Type G2 followed by Elastobase (poly/sand), mechanically attached	(Optional) Elastoflex SA V FR Base, self-adhered	Polyflex SA P FR, Elastoflex SA P FR, adhered; or Polyflex G FR	19, 20
15	A	Noncom-bustible	2:12	None	Any thickness, Atlas AC Foam III or Hunter Panels H-Shield	Mechanically attached or loose laid	Elastobase (poly/sand) mechanically attached; or Elastoflex SA V FR Base or Elastoflex SA Vent FR, self-adhered	None	Polyflex SA P FR, Elastoflex SA P FR, Elastoflex SA V FR, self-adhered; or Polyflex G FR	11, 12, 21

TABLE 2—POLYGLASS ROOFING SYSTEMS, EXTERNAL FIRE RESISTANCE CLASSIFICATIONS—(Continued)

SYS- TEM NO.	ROOF CLASSIFI- CATION ^{1,2}	SUB- STRATE ^{3,4,5}	MAX. SLOPE	INSULATION ⁶ /BARRIER BOARDS			ROOF COVERING APPLICATION			WIND CLAS- SIFICATION REFERENCE (See Table 3)
				Barrier Board	Insulation/ Thickness	Attachment	Base Sheet or Slip Sheet	Ply Sheet	Membrane	
16	A	Noncom- bustible	3:12	None	Any thickness, Atlas AC Foam III or Hunter Panels H-Shield	Mechanically attached	Elastoflex SA V FR Base or Elastoflex SA Vent FR, self- adhered.	None	Polyflex SA P FR or Elastoflex SA P FR, self- adhered	12
17	B	Noncom- bustible	1:12	None	(Optional) Any thickness polyisocyanurate	Mechanically attached or adhered	Elastobase (poly/sand) mechanically attached or Elastoflex SA V Base or SA Vent, self- adhered	None	Polyflex SA P, Elastoflex SA P, self-adhered, or Polyflex G, heat-fused	14, 21
18	B	Combust- ible (plywood)	1/4:12	None	None	N/A	Elastobase (poly/sand) mechanically attached	Elastoflex SA V Base self- adhered.	Polyflex SA P, Elastoflex SA P, self-adhered, or Polyflex G heat-fused	19, 20
19	A	Noncom- bustible	1:12	None	(Optional) Min. 1 1/2-inch- thick polyisocyanurate foam plastic	Mechanically attached or adhered	Elastoflex SA V Base or SA Vent, self- adhered	None	Polyflex SA P self- adhered	11, 12, 14
20	C	Noncom- bustible	0.5:12	None	1.5" H-Shield	Mechanically attached	Elastobase (poly/sand), mechanically attached	None	Polyflex SA P, self- adhered	21
21	A	Noncom- bustible	0.5:12	None	1.5" H-Shield	Mechanically attached	Elastoflex SA V FR Base or SA Vent FR, self-adhered	None	Elastoflex SA P FR, self- adhered	12

¹System installed over existing Class B built-up roof system to retain existing classification.

²System installed over existing Class A, B or C cap sheet or smooth-surfaced built-up roof, insulated or noninsulated, and/or single-ply membrane (EPDM, PVC or CPE), to maintain existing classification.

³Noncombustible deck classifications are applicable for use over combustible decks (plywood), when minimum 1/2-inch-thick Type X gypsum board or minimum 1/4-inch-thick Dens-Deck is used directly over the deck with all joints staggered 6 inches from plywood joints.

⁴Unless otherwise noted, noncombustible substrates include concrete, lightweight concrete, and steel decks.

⁵For use of foam plastic insulation over plywood deck, refer to UBC Section 2602.5.3 or IBC Section 2603.4.

⁶All insulation must be UL classified. Additionally, all foam plastic must be covered under a current evaluation report. If the foam plastic is installed over a steel deck without a thermal barrier, the evaluation report on the insulation must address its use in such an installation.

⁷The barrier board shall be mechanically fastened to the deck with all joints staggered 6 inches from plywood joints.

TABLE 3—METHOD OF ATTACHMENT OF ROOFING MEMBRANE AND INSULATION

SYSTEM NO.	SUBSTRATE	VAPOR BARRIER	BARRIER BOARD AND/OR INSULATION		COVERBOARD		ROOF COVER			ALLOWABLE UPLIFT CAPACITY (psf)	ALLOWABLE LOCATIONS BASED ON UPLIFT CAPACITY ^{1,5,8}					
			Type	Attachment ^{1,2}	Type	Attachment ¹	Base Sheet ¹	Ply Sheet	Membrane ³		Max. Basic Wind Speed (mph)	V fm (UBC)	V 3s (IBC)	UBC Section 1619	Exposure Category	IBC Section 1609.4
1	Min. 22 ga. steel, min. 2,500 psi concrete or min. 3/4" thick plywood	N/A	Min. 1.5-inch, min. 2.0 pct polyisocyanurate	1 per 4 ft ²	Min. 3/4-inch FM Approved perlite	Asphalt applied	(Optional) Elastobase, PermaPly No. 28 or #75 in hot asphalt	(Optional) One ply of Elastobase, PermaPly No. 28 or #75 or one to three plies of Polyglass Ply 4 or Ply 6 in hot asphalt	Torch applied	45	120	150	B	B		
2	Min. 22 ga. steel, min. 2,500 psi concrete or min. 3/4" thick plywood	N/A	(Optional if perlite used) Min. 1.5-inch, min. 2.0 pct polyisocyanurate, min. 1/2-inch Dens-deck, min. 5/8-inch type X gypsum or min. 1.5-inch polyiso / perlite composite	Loose laid	(Optional if insulation used) Min. 3/4-inch FM Approved perlite	Loose laid	Elastobase or PermaPly No. 28 attached Dekfast Hex or Polygrip Hex with #14 Polygrip or Isofast IF/IG-70x70 with Isofast IF2 spaced 12 inches o.c. in a 4-inch lap and 18 inches o.c. in two staggered rows in the center of the sheet	(Optional) One ply of Elastobase, PermaPly No. 28 or #75 or one to three plies of Polyglass Ply 4 or Ply 6 in hot asphalt	Torch applied	45	100	125	C	C		
2a	Same as System No. 2, with Base Sheet attached 12 inches o.c. in the 4-inch lap and 18 inches o.c. in one center row.										100	120	B	B		
											80	105	C	C		
											70	90	D	D		

TABLE 3—METHOD OF ATTACHMENT OF ROOFING MEMBRANE AND INSULATION—(Continued)

SYSTEM NO.	SUBSTRATE	VAPOR BARRIER	BARRIER BOARD AND/OR INSULATION		COVERBOARD		ROOF COVER			ALLOWABLE UPLIFT CAPACITY (psf)	ALLOWABLE LOCATIONS BASED ON UPLIFT CAPACITY ^{1,5,8}			
			Type	Attachment ^{1,2}	Type	Attachment ¹	Base Sheet ¹	Ply Sheet	Membrane ³		Max. Basic Wind Speed (mph)	Exposure Category		
												V (UBC)	V 3s (IBC)	UBC Section 1619
3	Min. 22 ga. steel, min. 2,500 psi concrete or min. 3/4" thick plywood	N/A	(Optional if perlite used) Min. 1.5-inch, min. 2.0 pcf polyiso-cynaurate, min. 1/4-inch Dens-Deck, min. 5/8-inch type X gypsum	Preliminary securement ⁴	(Optional if insulation used) Min. 3/4" thick FM Approved perlite or min. 1/2-inch FM Approved wood fiberboard	Preliminary securement ⁴	Polyflex attached Polygrip 2 1/2" Membrane Plates and #14 Polygrip or Dekfast 2 1/2" HS Plates and #14 Dekfast 18 inches o.c. in 5-inch-wide, heat welded lap.	None	Torch applied	45	120	150	B	B
4										82.5	130	170	C	C
5	Min. 2,500 psi concrete or min. 3/4" thick plywood	N/A	(Optional) 1/4-inch DensDeck or 5/8-inch type X gypsum board	Loose laid	None	N/A				See System No. 2	120	150	D	D
5a	Min. 2,500 psi concrete or min. 3/4" thick plywood	N/A	(Optional) 1/4-inch DensDeck or 5/8-inch type X gypsum board	Loose laid	None	N/A				See System No. 2a				
6	Min. 2,500 psi concrete or min. 3/4" thick plywood	N/A	(Optional) 1/4-inch DensDeck or 5/8-inch type X gypsum board	Loose laid	None	N/A				See System No. 3				
7	Min. 2,500 psi concrete or min. 3/4" thick plywood	N/A	(Optional) 1/4-inch DensDeck or 5/8-inch type X gypsum board	Loose laid	None	N/A				See System No. 4				
8	Min. 2,500 psi concrete	N/A	None	N/A	None	N/A	(Optional when using ply sheet) Elastobase, PermaPly No. 28 or #75 in hot asphalt	(Optional when using base sheet) One ply of Elastobase, PermaPly No. 28 or #75 or one to three plies of Polyglass Ply 4 or Ply 6 in hot asphalt	Torch applied	622.5	130	170	D	D

TABLE 3—METHOD OF ATTACHMENT OF ROOFING MEMBRANE AND INSULATION—(Continued)

SYSTEM NO.	SUBSTRATE	VAPOR BARRIER	BARRIER BOARD AND/OR INSULATION		COVERBOARD		ROOF COVER			ALLOWABLE UPLIFT CAPACITY (psf)	ALLOWABLE LOCATIONS BASED ON UPLIFT CAPACITY ^{1,5,8}			
			Type	Attachment ^{1,2}	Type	Attachment ¹	Base Sheet ¹	Ply Sheet	Membrane ³		Max. Basic Wind Speed (mph)		Exposure Category	
											V fm (UBC)	V 3s (IBC)	UBC Section 1619	IBC Section 1609.4
9	Min. 2,500 psi concrete	N/A	None	N/A	N/A	Polyflex, torch applied	None	Torch applied	622.5	130	170	D	D	
10	Min. 200 psi FM Approved Cellular Lightweight Concrete Decks ⁶	N/A	None	N/A	N/A	GAFGLAS #75 attached Buildex Lite Weight Concrete Fasteners 7 inches o.c. in a 4-inch lap and 7-inch o.c. in two staggered rows in the center of the sheet	(Optional) One ply of Elastobase, PermaPly No. 28 or GAFGLAS #75 or one to three plies of Polyglass Ply 4 or Ply 6 in hot asphalt	Torch applied	45	120	150	B	B	
11	Min. 22 ga. steel	None	Min. 1.5-inch ENRGY 3 insulation	#14 Dekfast with 70x70 mm plates at 1 per 1.3 ft ²	N/A	Elastoflex SA Vent; SA V Base; FR; SA V Base; SA V FR or SA P Smooth or Polyflex SA P Smooth, self-adhered	(Optional) Elastoflex SA V Base; FR or SA P Smooth or Polyflex SA P Smooth, self-adhered or applied ply sheet	Self-adhered or torch applied	82.5	130	170	C	C	
										120	150	D	D	

TABLE 3—METHOD OF ATTACHMENT OF ROOFING MEMBRANE AND INSULATION—(Continued)

SYSTEM NO.	SUBSTRATE	VAPOR BARRIER	BARRIER BOARD AND/OR INSULATION		COVERBOARD		ROOF COVER			ALLOWABLE UPLIFT CAPACITY (psf)	ALLOWABLE LOCATIONS BASED ON UPLIFT CAPACITY ^{1,5,8}			
			Type	Attachment ^{1,2}	Type	Attachment ¹	Base Sheet ¹	Ply Sheet	Membrane ³		Max. Basic Wind Speed (mph)	CAPACITY		
												V (UBC)	V 3s (IBC)	UBC Section 1619
12	Min. 22 ga. steel, min. 2,500 psi concrete	None	Min. 1.5-inch H-Shield, Polytherm	1 per 2 ft ²	None	N/A	(Optional) Elastoflex SA V Base FR, self-adhered	None	Elastoflex SA P G FR, self-adhered	60	130	170	B	B
											110	145	C	C
13	Min. 2,500 psi concrete, primed with asphalt primer	(Optional) Elastoflex SA Vent; SA Vent FR; SA V; SA V FR; or SA P or Polyflex SA P, followed by torch or SA cap sheet	One or more layers AC Foam II, ENRGY 3 or Multi-Max FA insulation	Hot asphalt, Insta-Stik, Spray-N-Grip, Weather-Tite Pourable Foam or One Step; OlyBond or OlyBond 500 or TITSEET	Min. 1/4-inch DensDeck primed with asphalt primer	Hot asphalt, Insta-Stik, Spray-N-Grip, Weather-Tite Pourable Foam or One Step; OlyBond or OlyBond 500 or TITSEET	Elastoflex SA Vent; SA Vent FR; SA V Base FR; SA V FR or SA P Smooth or SA P Smooth, self-adhered or torch applied	(Optional) Elastoflex SA V Base FR or SA P Smooth, self-adhered or torch applied ply sheet	Self-adhered or torch applied	37.5	80	85	B	B
											130	140	B	B
14	Min. 2,500 psi concrete, primed with asphalt primer	(Optional) Elastoflex SA Vent; SA Vent FR; SA V; SA V FR; or SA P or Polyflex SA P, followed by torch or SA cap sheet	One or more layers AC Foam II, ENRGY 3 or Multi-Max FA insulation	Hot asphalt, Insta-Stik, Spray-N-Grip, Weather-Tite Pourable Foam or One Step; OlyBond or OlyBond 500 or TITSEET	None	N/A	Elastoflex SA Vent; SA Vent FR; SA V Base FR or SA P Smooth, self-adhered or torch applied ply sheet	(Optional) Elastoflex SA V Base FR or SA P Smooth, self-adhered or torch applied ply sheet	Self-adhered or torch applied	100	110	120	C	C
											100	110	D	D
											100	110	D	D

TABLE 3—METHOD OF ATTACHMENT OF ROOFING MEMBRANE AND INSULATION—(Continued)

SYSTEM NO.	SUBSTRATE	VAPOR BARRIER	BARRIER BOARD AND/OR INSULATION		COVERBOARD		ROOF COVER			ALLOWABLE UPLIFT CAPACITY (psf)	ALLOWABLE LOCATIONS BASED ON UPLIFT CAPACITY ^{1,5,8}			
			Type	Attachment ^{1,2}	Type	Attachment ¹	Base Sheet ¹	Ply Sheet	Membrane ³		Max. Basic Wind Speed (mph)	Exposure Category		
												V fm (UBC)	V 3s (IBC)	UBC Section 1619
15	Min. 2,500 psi concrete, primed with asphalt primer	None	None	N/A	None	N/A	Elastoflex SA Vent; SA V FR; SA V Base; SA V FR or SA P Base FR or SA P SA P Smooth or Polyflex SA self-adhered or applied ply sheet	Self-adhered or torch applied	200	130	170	D	C	
														150
16	Min. 2,500 psi concrete, primed with asphalt primer	None	None	N/A	None	N/A	Elastoflex SA V Base FR, self-adhered	None	315	130	170	D		
													17	Min. 2,500 psi concrete, primed with asphalt primer
18	Plywood primed with asphalt primer	None	None	N/A	None	N/A	Elastoflex SA Vent; SA V FR; SA V Base; SA V FR or SA P Base FR or SA P SA P Smooth or Polyflex SA self-adhered or applied ply sheet	Self-adhered or torch applied	45	90	90	B		
													70	C

TABLE 3—METHOD OF ATTACHMENT OF ROOFING MEMBRANE AND INSULATION—(Continued)

SYSTEM NO.	SUBSTRATE	VAPOR BARRIER	BARRIER BOARD AND/OR INSULATION		COVERBOARD		ROOF COVER			ALLOWABLE UPLIFT CAPACITY (psf)	ALLOWABLE LOCATIONS BASED ON UPLIFT CAPACITY ^{1,5,8}									
			Type	Attachment ^{1,2}	Type	Attachment ¹	Base Sheet ¹	Ply Sheet	Membrane ³		Max. Basic Wind Speed (mph)	UBC Section 1619		IBC Section 1609.4						
												V fm (UBC)	V 3s (IBC)	UBC	IBC					
19	Min. ¹⁵ / ₃₂ -inch BCX plywood	None	None	N/A	N/A	Optional ASTM D 4601, type II base sheet loose laid followed by Elastobase (poly/sand) attached with min. 11 ga. ring shank cap nails with a min. 1-inch dia. round cap 6-inch o.c. in the 3-inch lap and 6-inch o.c. in two staggered rows in the field of the sheet	(Optional) Elastoflex SA V Bsaе FR, self-adhered	Elastoflex SA P G FR or Polyflex SA P G FR self-adhered or Polyflex G FR heat welded	90	110	130	B	B							
20	Min. ¹⁵ / ₃₂ -inch OSB				Same as System No. 19					30	80	100	120	70	90	105	B	B	C	D

TABLE 3—METHOD OF ATTACHMENT OF ROOFING MEMBRANE AND INSULATION—(Continued)

1. For mechanically fastened insulation, coverboards or base sheets the Allowable Locations are based on field roof areas (Zone 1), and the fastener density shall be increased at edge strips and end zones, as defined in Section 6 of ASCE 7 and IBC Section 1609.6.3. The increase shall be determined by a qualified design professional in accordance with industry accepted design standards, such as the Florida Building Code TAS 117 or the FM Loss Prevention Data Sheet 1-29.
2. Unless otherwise noted, insulation fasteners and plates shall be Polygrip or Dekfast #12 (steel and wood only), Polygrip or Dekfast #14 or #15 with Polygrip or Dekfast Hex Plates.
3. Torch applied membranes include Polyflex, Polyflex G and Polyflex G FR. Self-adhered membranes include Elastoflex SA P G FR or Polyflex SA P G FR.
4. Preliminary securement consists of four fasteners per board for a board having any dimension > 4 ft and two fasteners per board for a board having a maximum dimension of 4 ft.
5. The Allowable Locations Based on Uplift Capacity are based on a maximum roof height of 40 ft. For other roof heights less than or equal to 60 ft, refer to IBC Section 1609.6. For other roof heights greater than 60 ft, refer to IBC Section 1609.1.1
6. Cellular lightweight concrete shall have documented wind uplift resistance testing in accordance with FM Standard 4470 or Standard 4454 by an IAS-accredited laboratory to a minimum passing pressure of 90 psf. Cellular lightweight concrete decks shall be prepared / installed in accordance with the wind uplift test report or listings resulting there from.
7. All of the systems noted are Class 'A' fire-rated systems when installed over noncombustible decks at a maximum slope of ½: 12, except those involving self-adhering (SA) membranes.. If Polyflex or Polyflex G is the top membrane, a coating application of Karnak #97 at 1.5 gallons/square is required for the ½:12 Class 'A' rating. "FR" rated sheets require no coating. For combustible decks, for slopes in excess of these maximums and for self-adhering (SA) membranes, refer to Table 1.
8. For mechanically fastened systems, Allowable Locations are based on the field pressure zone (Zone 1), as supplemental attachment is required for Zones 2 and 3 (See Note 1). For bonded systems, Allowable Locations are based on corner zones (Zone 3), as no additional securement is possible.
9. Insulation Adhesive Application Rates are as follows (consult adhesive manufacturers published installation instructions for further details):
 - Hot asphalt at 25-30 lbs/square.
 - Dow Chemical, Insta-Stik applied in ¾- to 1-inch-diameter beads spaced max. 12" o.c.
 - Dow Chemical, Spray-N-Grip spray applied in full coverage to approximately 1 gallon per square.
 - Millennium Weather-Tite Pourable Foam Insulation Adhesive applied in ¾-inch-wide strips spaced max. 12" o.c.
 - Millennium Weather-Tite One Step Insulation Adhesive applied applied in ¾-inch-diameter beads spaced max. 12" o.c.
 - Olympic Olybond spray applied in full coverage to approximately 1 gallon per square.
 - Olympic Olybond 500 applied in ¾-inch-diameter beads spaced max. 12" o.c.
 - Polyfoam Products TITASET spray applied in continuous 3-inch-wide ribbons spaced max. 12" o.c.