

ICC-ES Evaluation Report

ESR-1388

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**DIVISION: 07 00 00—THERMAL AND MOISTURE
PROTECTION**
Section: 07 52 00—Modified Bituminous Sheet Roofing
REPORT HOLDER:
CERTAINTEED CORPORATION
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EVALUATION SUBJECT:
**CERTAINTEED FLINTLASTIC MODIFIED BITUMEN ROOF
COVERING SYSTEMS**

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2006 *International Building Code*® (IBC)
- 2006 *International Residential Code*® (IRC)
- 1997 *Uniform Building Code*™ (UBC)

Properties evaluated:

- Fire classification
- Wind uplift resistance
- Physical properties
- Impact resistance

2.0 USES

The CertainTeed Flintlastic modified bitumen roof covering membranes are used as roof coverings in Class A, B or C roof covering systems, described in this report, on new or existing roofs.

3.0 DESCRIPTION

3.1 General:

CertainTeed roofing membranes are atactic polypropylene (APP) or styrene butadiene styrene (SBS) modified bitumen membranes complying with ASTM D 6222, ASTM D 6163 or ASTM D 6164, as applicable. Roof covering systems utilizing CertainTeed roofing membranes consist of single-ply membranes, base sheets and ply sheets, approved insulation, flashing, asphalts, adhesives, coatings and mechanical fasteners that are installed to produce an integrated roof system.

3.2 Membranes:

3.2.1 Flintlastic FR Cap 30: Flintlastic FR Cap 30 is a 0.14-inch-thick (3.5 mm), granular-surfaced, reinforced,

SBS modified bitumen roofing membrane manufactured from a glass fiber mat impregnated and covered with SBS modified bitumen. The membrane is a Type I, Grade G, membrane complying with ASTM D 6163 and intended for adhesive or hot asphalt application. The membrane weighs approximately 7.2 pounds per square yard (3.9 kg/m²).

3.2.2 Flintlastic FR-P: Flintlastic FR-P is a 0.17-inch-thick (4.3 mm), granular-surfaced, reinforced, SBS modified bitumen roofing membrane manufactured from a nonwoven polyester fabric impregnated and covered with SBS modified bitumen. The membrane is a Type I, Grade G, membrane complying with ASTM D 6164 and intended for adhesive or hot asphalt application. The membrane weighs approximately 8.4 pounds per square yard (4.6 kg/m²).

3.2.3 Flintlastic Premium FR-P: Flintlastic Premium FR-P is a 0.17-inch-thick (4.3 mm), mineral-surfaced, reinforced, SBS modified bitumen roofing membrane manufactured from a nonwoven polyester fabric impregnated and covered with SBS modified bitumen. The membrane is a Type II, Grade G, membrane complying with ASTM D 6164 and intended for adhesive or hot asphalt application. The membrane weighs approximately 8.4 pounds per square yard (4.6 kg/m²).

3.2.4 Flintlastic SA P-Cap FR: Flintlastic SA P-Cap FR is a 0.15-inch-thick (3.8 mm), granular-surfaced, reinforced, SBS modified bitumen roofing membrane manufactured from a nonwoven polyester fabric impregnated and covered with SBS modified bitumen. The membrane is a Type I, Grade G, membrane complying with ASTM D 6164 and intended for self-adhered application. The membrane weighs approximately 7.2 pounds per square yard (3.9 kg/m²).

3.2.5 Flintlastic GTS: Flintlastic GTS is a 0.18-inch-thick (4.5 mm), granular-surfaced, reinforced, SBS modified bitumen roofing membrane manufactured from a nonwoven polyester fabric impregnated and covered with SBS modified bitumen. The membrane is a Type II, Grade G, membrane complying with ASTM D 6164 and intended for torch application only. The membrane weighs approximately 9.9 pounds per square yard (5.4 kg/m²).

3.2.6 Flintlastic GMS: Flintlastic GMS is a 0.17-inch-thick (4.3 mm), granular-surfaced, reinforced, SBS modified bitumen roofing membrane manufactured from a nonwoven polyester fabric impregnated and covered with SBS modified bitumen. The membrane is a Type I, Grade G, membrane complying with ASTM D 6164 and intended for adhesive or hot asphalt application. The membrane weighs approximately 8.0 pounds per square yard (4.4 kg/m²).

3.2.7 Flintlastic Premium GMS: Flintlastic Premium GMS is a 0.17-inch-thick (4.3 mm), granular-surfaced, reinforced, SBS modified bitumen roofing membrane manufactured from a nonwoven polyester fabric impregnated and covered with SBS modified bitumen. The membrane is a Type II, Grade G, membrane complying with ASTM D 6164 and intended for adhesive or hot asphalt application. The membrane weighs approximately 8.4 pounds per square yard (4.6 kg/m²).

3.2.8 Flintlastic STA: Flintlastic STA is a 0.16-inch-thick (4 mm), smooth-talc-surfaced, reinforced, APP modified bitumen roofing membrane. Flintlastic STA is used as a cap sheet or ply sheet and is manufactured from a nonwoven polyester fabric impregnated and covered with APP modified bitumen. The membrane is a Type I, Grade S, membrane complying with ASTM D 6222 and intended for torch application only. The membrane weighs approximately 7.4 pounds per square yard (4.0 kg/m²).

3.2.9 Flintlastic STA Plus: Flintlastic STA Plus is a 0.18-inch-thick (4.5 mm), smooth-talc-surfaced, reinforced, APP modified bitumen roofing membrane. The membrane is used as a cap sheet or ply sheet and is manufactured from a nonwoven polyester fabric impregnated and covered with APP modified bitumen. The membrane is a Type I, Grade S, membrane complying with ASTM D 6222 and intended for torch application only. The membrane weighs approximately 8.1 pounds per square yard (4.4 kg/m²).

3.2.10 Flintlastic GTA: Flintlastic GTA is a 0.16-inch-thick (4 mm), granular-surfaced, reinforced, APP modified bitumen roofing membrane manufactured from a nonwoven polyester fabric impregnated and covered with APP modified bitumen. The membrane is a Type I, Grade G, membrane complying with ASTM D 6222 and intended for torch application only. The membrane weighs approximately 7.8 pounds per square yard (4.2 kg/m²).

3.2.11 Flintlastic White Diamond GTA: Flintlastic White Diamond GTA is a 0.16-inch-thick (4 mm), fine-granular-surfaced, reinforced, APP modified bitumen roofing membrane manufactured from a nonwoven polyester fabric impregnated and covered with APP modified bitumen. The membrane is a Type I, Grade G, membrane complying with ASTM D 6222 and intended for torch application only. The membrane is available coated with fine white ceramic particles and weighs approximately 7.8 pounds per square yard (4.2 kg/m²).

3.2.12 Flintlastic GTA-FR: Flintlastic GTA-FR is a 0.16-inch-thick (4 mm), granular-surfaced, reinforced, APP modified bitumen roofing membrane manufactured from a nonwoven polyester fabric impregnated and covered with APP modified bitumen. The membrane is a Type I, Grade G, membrane complying with ASTM D 6222 and intended for torch application only. The membrane weighs approximately 8.6 pounds per square yard (4.7 kg/m²).

3.2.13 Flintlastic SA Cap FR: Flintlastic SA Cap FR is a 0.13-inch-thick (3.2 mm), granular-surfaced, reinforced, SBS modified bitumen roofing membrane manufactured from a glass fiber mat impregnated and covered with SBS modified bitumen. The membrane is a Type I, Grade G membrane complying with ASTM D 6163 and is intended for self-adhered application. The membrane weighs approximately 7.3 pounds per square yard (4.0 kg/m²).

3.2.14 Flintlastic FR Cap 30 T: Flintlastic FR Cap 30 T is a 0.15-inch-thick (3.8 mm), granular-surfaced, reinforced, SBS modified bitumen roofing membrane manufactured from a glass fiber mat impregnated and covered with SBS modified bitumen. The membrane is a Type I, Grade G

membrane complying with ASTM D 6163 and is intended for torch application only. The membrane weighs approximately 8.1 pounds per square yard (4.4 kg/m²).

3.3 Insulation:

Foam plastic insulation, where used, must have a flame-spread index of not more than 75 when tested, at the maximum thickness intended for use, in accordance with ASTM E 84 (UBC Standard 8-1). See Tables 1A, 1C and 2A through 2F for insulations permitted for use with specific roofing systems.

3.4 Fasteners:

Fasteners and plates used to mechanically fasten insulation and base sheets must be in accordance with Table 3 unless otherwise noted.

3.5 Impact Resistance:

The CertainTeed Flintlastic modified bitumen roof coverings described in this report meet the requirement for impact resistance in accordance with FM 4470.

4.0 INSTALLATION

4.1 General:

Installation of the CertainTeed Flintlastic membrane roof covering systems described in this report must comply with the applicable code, the manufacturer's published installation instructions and this report. The manufacturer's published installation instructions must be available at all times on the jobsite during installation. CertainTeed Flintlastic roofing membranes are components of roof covering systems that may be installed over new or existing roofs as described in Tables 1A through 1D and 2A through 2F.

The roof slope must be a minimum of $\frac{1}{4}$:12 (2 percent slope) and must not be more than maximum slope for the particular system as specified in Tables 1A through 1D.

Penetrations and terminations of the roof covering must be flashed and made weathertight in accordance with the CertainTeed Corporation published installation instructions and the applicable code.4.2

4.2 Fire Classification:

4.2.1 New Construction: Roof covering systems described in Tables 1A through 1D, when installed in accordance with this report, are Class A, B or C roof coverings in accordance with ASTM E 108 or UL 790.

4.2.2 Reroofing: Prior to installation of new roof coverings, inspection in accordance with IBC Section 1510, IRC Section R907 or UBC Appendix Chapter 15, and approval from the code official having jurisdiction, are required.

Class A, B or C roof covering systems may be installed over existing roof coverings without additional roof classification tests, provided the resulting classification is the lower of the new and existing roofing classifications under the following conditions:

- New uninsulated systems installed only over existing uninsulated systems
- New insulated systems installed over existing uninsulated systems only

4.3 Wind Uplift Resistance:

4.3.1 New Construction: The CertainTeed Flintlastic membrane roof covering systems described in this report

have a maximum allowable wind uplift capacity as shown in Tables 2A through 2F. Metal edge securement for all systems must be designed in accordance with ANSI/SPRI ES-1, complying with IBC Section 1504.5.

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

5.0 CONDITIONS OF USE

The CertainTeed Flintlastic membrane roof covering systems described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 Installation must comply with the applicable code, the manufacturer's published installation instructions and this report. The instructions within this report govern if there are any conflicts between the manufacturer's published installation instructions and this report.
- 5.2 The roof covering systems must be installed only by authorized applicators approved by CertainTeed Corporation.
- 5.3 Foam plastic insulation must be separated from the interior of the building by an approved thermal barrier in accordance with IBC Section 2603.4.1.5, IRC Section R314.1.2 and UBC Section 2602.5.3, except when specifically recognized in an ICC-ES evaluation report as outlined in Footnote 3 following Table 1D.
- 5.4 For all above-deck insulations except foam plastics, the roof covering assembly, including such insulation, must have passed testing in accordance with UL 1256 or FM 4450.
- 5.5 Foam plastic insulation, where used, must bear the label of an approved testing and listing agency indicating that the foam plastic has a flame-spread index of not more than 75 when tested at the maximum thickness intended for use in accordance with ASTM E 84 (UBC Standard -1). Except for applications where a thermal barrier is not required, total thickness of foam plastic insulation must be limited to the lesser of the maximum thickness allowed in Tables 1A, 1C and 2A through 2F or the maximum thickness that limits the flame-spread index to not more than 75 when testing is in accordance with ASTM E 84 (UBC Standard 8-1).

5.6 Design wind uplift pressure on any roof area, including edge and corner zones, must not exceed the allowable wind uplift pressure for the roof covering installed in that particular area. Refer to allowable wind uplift pressure shown in Tables 2A through 2F.

5.7 The allowable wind-uplift pressures shown in Tables 2A through 2F are for the roof covering only. The deck and framing to which the roof covering is attached must be designed for the applicable components, and cladding wind loads in accordance with the applicable code.

5.8 Calculations demonstrating that the required wind resistance is less than the allowable wind resistance must be submitted to the code official for approval.

5.9 When application is over existing roofs, documentation of the wind-uplift resistance of the composite roof construction must be submitted to the code official.

5.10 The membranes are manufactured in Little Rock, Arkansas, under quality control programs with inspections by UL LLC (AA-668).

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Membrane Roof-covering Systems (AC75), dated April 2007 (corrected December 2008).

7.0 IDENTIFICATION

Each roll of CertainTeed Flintlastic roofing membrane covered by this report is labeled with the CertainTeed Corporation name and address, product name, date code, evaluation report number (ESR-1388) and the name of the inspection agency UL LLC.

TABLE 1A—EXTERNAL ROOF FIRE CLASSIFICATIONS^{1,7} INSULATED NONCOMBUSTIBLE DECKS⁶

SYSTEM NO.	CLASS	MAX. ROOF SLOPE	VAPOR BARRIER OR ANCHOR SHEET ⁴	INSULATION ^{2,3,8} / THICKNESS	ROOF COVER			
					Base Sheet ⁴	Ply Sheet ⁴	Membrane	Surfacing
A-1	A	1:12	(Optional) Type G2 or G2 Glasbase (MA) or (HM)	Perlite, glass fiber or wood fiber / max. 7.2-inch	Type G2 or G2 Glasbase (MA) or (HM)	None	Flintlastic GTA or GTS (HW) or Flintlastic GMS (HM) or Premium GMS (HM)	Karnak No. 97 Fibrated Aluminum at 1 1/2 gal/sq.
A-2	A	3/4:12	(Optional) Type G2 or G2 Glasbase (MA) or (HM)	Perlite, glass fiber or wood fiber / max. 7.2-inch	Type G2 or G2 Glasbase (MA) or (HM)	None	Flintlastic STA or STA Plus (HW)	Karnak No. 97 Fibrated Aluminum at 1 1/2 gal/sq.
A-3	B	1:12	(Optional) Type G2 or G2 Glasbase (MA) or (HM)	Perlite, glass fiber or wood fiber / max. 7.2-inch	Type G2 or G2 Glasbase (MA) or (HM)	None	Flintlastic STA or STA Plus (HW)	Karnak No. 97 Fibrated Aluminum at 1 1/2 gal/sq.
A-4	A	1/2:12	None	Polyisocyanurate, perlite, glass fiber or wood fiber / minimum 1 inch thick	Type G1 or G2 (MA) or (HM)	(Optional) One or more Type G1 or G2 (HM)	Flintlastic STA or STA Plus, GTA or GTA White Diamond (HW)	Tropical 120AF, Karnak No. 97 AF, Henry No. 520, Grundy AIMP AF at 1 1/2 gal/sq. or Monsey Fibrated Asphalt Emulsion or Henry No. 107 Emulsion at 3 gal/sq.
A-5	A	1 1/2:12	None	Polyisocyanurate, perlite, glass fiber or wood fiber / any thickness	Type G2 or G2 Glasbase (MA) or (HM)	(Optional) One or more Type G1 or G2 (HM)	Flintlastic GTA-FR (HW)	None
A-6 ⁵	A	1/2:12	None	1.5-inch min. to 4 in. max. ENRGY 3, ACFoam II or FlintBoard Iso followed by min. 3/4-inch Fesco Board or Permalite or min. 1/2-inch DensDeck or DensDeck Prime	Glasbase or Flexiglas or Flexiglas FR (MA)	(Optional) PolySMS or UltraPoly SMS base applied with Karnak No. 81 at 1 1/2 gal/sq.	Flintlastic FR-P, Premium FR-P or Flintlastic FR Cap applied with Karnak No. 81 at 1 1/2 gal/sq.	None
A-7	A	1 1/2:12	None	Min. 4 inch Polyisocyanurate	Flintlastic Base 20 T (HW)	None	Flintlastic FR Cap 30 T (HW)	None

For SI: 1 inch = 25.4 mm, 1 gal/sq. = 0.41 l/m².

TABLE 1B—EXTERNAL ROOF FIRE CLASSIFICATIONS^{1,7} NONINSULATED NONCOMBUSTIBLE DECKS⁶

SYSTEM NO.	CLASS	MAX. ROOF SLOPE	ROOF COVER			
			Base Sheet ⁴	Ply Sheet ⁴	Membrane	Surfacing
B-1	A	1:12	Type G2 or G2 Glasbase (MA) or (HM)	None	Flintlastic GTA or GTS (HW) or Flintlastic GMS or Premium GMS (HM)	Karnak No. 97 Fibrated Aluminum at 1 1/2 gal/sq.
B-2	A	3/4:12	Type G2 or G2 Glasbase (MA) or (HM)	None	Flintlastic STA or STA Plus (HW)	Karnak No. 97 Fibrated Aluminum at 1 1/2 gal/sq.
B-3	B	1:12	Type G2 or G2 Glasbase (MA) or (HM)	None	Flintlastic STA or STA Plus (HW)	Karnak No. 97 Fibrated Aluminum at 1 1/2 gal/sq.
B-4	A	1 1/2:12	Type G2 or G2 Glasbase (MA) or (HM)	(Optional) One or more Type G1 or G2 (HM)	Flintlastic GTA-FR (HW)	None
B-5	A	1/2:12	Flintlastic SA NailBase (MA)	None	Flintlastic SA P-Cap-FR (SA)	None
B-6	A	1/2:12	Flintlastic SA NailBase (MA) or Flintlastic SA PlyBase (SA to primed DensDeck or DensDeck DuraGuard only)	Flintlastic SA PlyBase (SA)	Flintlastic SA Cap FR (SA) or Flintlastic SA P-Cap FR (SA)	None

For SI: 1 inch = 25.4 mm, 1 gal/sq. = 0.41 l/m².

TABLE 1C—EXTERNAL ROOF FIRE CLASSIFICATIONS^{1,7} INSULATED COMBUSTIBLE DECKS⁶

SYSTEM NO.	CLASS	MAX. ROOF SLOPE	VAPOR BARRIER OR ANCHOR SHEET ⁴	INSULATION ^{2,3,8} / THICKNESS	ROOF COVER			
					Base Sheet ⁴	Ply Sheet ⁴	Membrane	Surfacing
C-1	A	1:12	Type G2 or G2 Glasbase (LL) or (MA)	Perlite or fiberglass / min. 1-inch, max. 1.5-inch	Type G2 or G2 Glasbase (MA) or (HM)	None	Flintlastic STA or STA Plus, GTA or GTS (HW) or Flintlastic GMS or Premium GMS (HM)	Flood coat and gravel at 400 pounds per square
C-2	A	1/4:12	(Optional) Type G2 or G2 Glasbase (LL) or (MA)	Perlite, glass fiber or wood fiber / max. 7.2-inch	Type G2 or G2 Glasbase (LL) or (MA)	Type G2 or G2 Glasbase (MA) or (HM)	Flintlastic GTA or GTS (HW) or Flintlastic GMS or Premium GMS (HM)	Karnak No. 97 Fibrated Aluminum at 1 1/2 gal/sq.
C-3	A	1/4:12	(Optional) Type G2 or G2 Glasbase (LL) or (MA)	Perlite / min. 1.5-inch	Type G2 or G2 Glasbase (MA) or (HM)	None	Flintlastic GTA or GTS (HW) or Flintlastic GMS or Premium GMS (HM)	Karnak No. 97 Fibrated Aluminum at 1 1/2 gal/sq.
C-4	A	1/2:12	None	Polyisocyanurate, perlite, glass fiber or wood fiber / any thickness	Type G2 or G2 Glasbase (MA) or (HM)	None	Flintlastic FR Cap (HM)	None
C-5	A	1/2:12	None	Perlite, glass fiber / any thickness	One or more Flexiglas Base or Flexiglas FR Base adhered with Monsey Bakor MBA Gold Adhesive at 1 1/2 gal/sq.	(Optional) One or more Type G1, Type G2 or Flexiglas Base or Flexiglas FR Base or PolySMS Base adhered with Monsey Bakor MBA Gold Adhesive at 1 1/2 gal/sq.	Flintlastic FR Cap adhered with Monsey Bakor MBA Gold Adhesive at 1 1/2 gal/sq.	None
C-6	A	1/2:12	None	DensDeck / min. 1/4-inch	Flintlastic SA NailBase (MA)	None	Flintlastic SA Cap-FR (SA)	None
C-7	C	2:12	None	Polyisocyanurate, perlite, glass fiber or wood fiber / any thickness	Flintlastic SA NailBase (MA)	Flintlastic SA Mid Ply (SA)	Flintlastic SA Cap-FR (SA)	None
C-8	A	1/2:12	None	Polyisocyanurate, perlite, glass fiber or wood fiber / any thickness DensDeck / min. 1/4-inch	Flintlastic SA NailBase (MA) or Flintlastic SA PlyBase (SA to primed DensDeck or DensDeck DuraGuard only)	Flintlastic SA PlyBase (SA)	Flintlastic SA Cap FR (SA) or Flintlastic SA P-Cap FR (SA)	None
C-9	C	Unlimited	None	Perlite, glass fiber or wood fiber / any thickness	Flintlastic SA NailBase (MA)	None	Flintlastic SA Cap FR (SA)	None
C-10	C	2:12	None	Polyisocyanurate, perlite, glass fiber or wood fiber / any thickness	Flintlastic SA NailBase (MA)	(Optional) Flintlastic SA Mid Ply (SA) or Flintlastic SA PlyBase (SA)	Flintlastic SA Cap FR (SA)	None
C-11	A	1 1/2:12	None	Flintboard ISO / min. 1.5 inch (presecured) DensDeck / min. 1/4-inch adhered in hot asphalt	Flintlastic Base 20 T (HW)	None	Flintlastic FR Cap 30 T (HW)	None

For SI: 1 inch = 25.4 mm, 1 gal/sq. = 0.41 l/m².

TABLE 1D—EXTERNAL ROOF FIRE CLASSIFICATIONS^{1,7} NONINSULATED COMBUSTIBLE DECKS⁶

SYSTEM NO.	CLASS	MAX. ROOF SLOPE	ROOF COVER			
			Base Sheet ⁴	Ply Sheet ⁴	Membrane	Surfacing
D-1	A	1/2:12	1 or more layers Yosemite (MA) or (HM)	None	Flintlastic FR-P or Premium FR-P (HM)	Firecade 2000 or Premium Long Life Aluminum Roof Coating at 1 1/2 gal/sq.
D-2	A	1/4:12	Type G2 or G2 Glasbase (LL) or (MA)	Type G2 or G2 Glasbase (MA) or (HM)	Flintlastic STA or STA Plus, GTA or GTS (HW) or Flintlastic GMS or Premium GMS (HM)	Karnak No. 97 Fibrated Aluminum at 1 1/2 gal/sq.
D-3	A	1/2:12	Type G2 or G2 Glasbase (MA) or (HM)	None	Flintlastic FR Cap (HM)	None
D-4	A	1/2:12	One or more Flexiglas Base or Flexiglas FR Base adhered with Monsey Bakor MBA Gold Adhesive at 1 1/2 gallons per square	(Optional) One or more Type G1, Type G2 or Flexiglas Base or Flexiglas FR Base or PolySMS Base adhered with Monsey Bakor MBA Gold Adhesive at 1 1/2 gal/sq.	Flintlastic FR Cap adhered with Monsey Bakor MBA Gold Adhesive at 1 1/2 gal/sq.	None
D-5	B	1/2:12	Type G2 or G2 Glasbase (MA)	(Optional) One or more Type G2 or G2 Glasbase (HM)	Flintlastic GTA (HW) or Flintlastic GMS or Premium GMS (HM)	None
D-6	A	1/2:12	Type G2 Glasbase (MA)	Flintlastic SA NailBase (MA)	Flintlastic SA Cap- FR (SA)	None
D-7	C	2:12	Flintlastic SA NailBase (MA)	Flintlastic SA Mid Ply (SA)	Flintlastic SA Cap-FR (SA)	None
D-8	C	Unlimited	Flintlastic SA NailBase (MA)	None	Flintlastic SA Cap-FR (SA)	None
D-9	C	2:12	Flintlastic SA NailBase (MA)	(Optional) Flintlastic SA Mid Ply (SA) or Flintlastic SA PlyBase (SA)	Flintlastic SA Cap-FR (SA)	None

For SI: 1 inch = 25.4 mm, 1 gal/sq. = 0.41 l/m².

Footnotes for Table 1A thru Table 1D, as applicable:

¹Unless otherwise specified (see Footnote 5), vapor barriers, anchor sheets, insulation, adhesives, base sheets, ply sheets, membranes, and surface coatings must be UL classified for roofing systems.

²Foam plastic insulation thickness is limited to the lesser of the maximum thickness specified in this table or the maximum thickness stated on the label, that limits the flame spread index to not more than 75 when tested in accordance with ASTM E 84 (UBC Standard 8-1).

³Foam plastic insulation may be installed over a steel deck without a thermal barrier when installed in accordance with an ICC-ES evaluation report recognizing direct application of a specific foam plastic insulation. Reference: 2006 IBC Section 2603.4.1.5.

⁴Type G1 and Type G2 relates to any UL classified fiberglass reinforced ply or base sheet respectively, complying with UL 55A.

⁵Insulation, adhesives, base sheets, ply sheets and membranes in system A-6 must be FM – Approved for roofing systems.

⁶Combustible wood decks must be minimum 15/32-inch-thick (11.9 mm) plywood, 7/16-inch-thick (11.1 mm) nonveneer APA rated oriented strand board or 3/4-inch-thick (19 mm) sheathing boards. Non-combustible steel decks must be minimum No. 22 gage galvanized steel [0.030 inch (0.76 mm)]. Concrete decks must have a minimum compressive strength (f_c) of 2500 psi. See Section 5.7 of this report.

⁷Abbreviations:

(MA) Mechanically Fastened

(HM) Hot Mopped with hot roofing asphalt conforming to ASTM D 312, Type III or IV.

(HW) Heat Welded

(LL) Loose Laid

(SA) Self-Adhered

⁸Polyisocyanurate insulation must comply with ASTM C 1289, Type I or Type II. Perlite insulation must comply with ASTM C 728. Wood fiberboard insulation must comply with ASTM C 2089.

TABLE 2A—WIND UPLIFT RESISTANCE: METHOD OF ATTACHMENT MECHANICALLY ATTACHED BASE INSULATION, BONDED COVERBOARD

SYSTEM NO.	SUBSTRATE	INSULATION ⁶		COVERBOARD ⁶		ROOF COVER ¹			ALLOWABLE UPLIFT CAPACITY (psf) ⁴
		Type	Attach ²	Type	Attachment Method	Base	Ply	Cap	
A-1	Min. 22 ga. Steel or min. 2,500 psi concrete	1.5-inch min. to 4-inch max. FlintBoard Iso, ACFoam II, ENRGY 3, or Multi-Max FA	1 fastener per 1.3 ft ²	Min. 3/4-inch FescoBoard	Hot mopped with hot asphalt	One to three plies applied in hot asphalt		Hot mopped with hot asphalt or heat welded	52.5
A-2	Min. 22 ga. Steel or min. 2,500 psi concrete	1.5-inch min. to 4-inch max. FlintBoard Iso, ACFoam II, ENRGY 3, or Multi-Max FA	1 fastener per 1.3 ft ²	Min. 1/2-inch HD Fiber Board Roof Insulation	Hot mopped with hot asphalt	One to three plies applied in hot asphalt		Hot mopped with hot asphalt or heat welded	67.5
A-3	Min. 22 ga. Steel	2-inch min. to 4-inch max. FlintBoard Iso or ACFoam II	1 fastener per 3.2 ft ²	Min. 1/2-inch Armor Board HD, BP High Strength, ERS Redi-Deck, GAFTEMP HD, Roof Insulation Board, Structodek HD Fiberboard or FiberBase HD1/HD6 or min. 3/4-inch ConPerl, Fesco Board or EnergyGuard Perlite	Hot mopped with hot asphalt	One to three plies applied in hot asphalt		Hot mopped with hot asphalt or heat welded	45.0

**TABLE 2B—WIND UPLIFT RESISTANCE: METHOD OF ATTACHMENT
ALL INSULATION LAYERS MECHANICALLY ATTACHED THROUGH TOP LAYER**

SYSTEM NO.	SUBSTRATE	INSULATION ⁶		COVERBOARD ⁶		ROOF COVER ¹			ALLOWABLE UPLIFT CAPACITY (psf) ⁴
		Type	Attach ²	Type	Attachment ² Method	Base	Ply	Cap	
B-1	Min. 22 ga. Steel, min. 2,500 psi concrete or min. ¹⁹ / ₃₂ -inch plywood	Min. 1.5-inch, min. 2.0 pcf polyisocyanurate	Loose laid	Min. ¹ / ₄ -inch DensDeck primed with FlintPrime SA at 0.3 gal/sq.	1 fastener per 1.3 ft ²	Flintlastic SA Mid Ply, self-adhered	(Optional) Flintlastic SA Mid Ply, self-adhered	Self-Adhered	45.0
B-2	Min. 22 ga. Steel or min. 2,500 psi concrete	1.5-inch min. to 4-inch max. FlintBoard Iso, ACFoam II, ENRGY 3 or Multi-Max FA	1 fastener per 1.3 ft ² through top layer	None	N/A	Black Diamond Base Sheet, self-adhered	(Optional) One or two plies applied in hot asphalt	Hot mopped with hot asphalt	52.5
B-3	Min. 22 ga. Steel or min. 2,500 psi concrete	1.5-inch min. to 4-inch max. FlintBoard Iso, ACFoam II, ENRGY 3 or Multi-Max FA	1 fastener per 1.3 ft ² through top layer	None	N/A	Black Diamond Base Sheet, self-adhered	(Optional) One or two plies applied in hot asphalt	Heat welded	82.5
B-4	Min. 22 ga. Steel or min. 2,500 psi concrete	Max. 3-inch-thick OC FOAMULAR 350 or max. 4-inch-thick Hy-Therm AP, Flintboard Iso, ACFoam II, PSI 25, H-Shield, H-Shield P, H-Shield WF or H-Shield NB.	Loose laid	Min. ¹ / ₂ -inch Armor Board HD, BP High Strength, ERS Redi-Deck, GAFTemp HD, Roof Insulation Board, Structodek HD Fiberboard or FiberBase HD1/HD6 or min. ³ / ₄ -inch ConPerl, Fesco Board or EnergyGuard Perlite or min. ¹ / ₄ -inch DensDeck or DensDeck Prime	1 fastener per 2 ft ²	One to three plies in hot asphalt full-mop or spot mopped in hot asphalt in 24-inch diameter spots spaced 30-inch o.c.		Hot mopped with hot asphalt or heat welded	45.0
B-5	Min. 22 ga. Steel or min. 2,500 psi concrete	1.5-inch min. to 4-inch max. Hy-Therm AP, ENRGY 3 or PSI-25 or min. 2-inch FlintBoard Iso or ACFoam II	Loose laid	Min. 1-inch Fesco Board	1 fastener per 1.6 ft ²	Yosemite or Channel Vent spot mopped in hot asphalt in 24-inch diameter spots spaced 30-inch o.c	None	Hot mopped with hot asphalt or heat welded	45.0
B-6	Min. 22 ga. Steel or min. 2,500 psi concrete	1.5-inch min. to 4-inch max. Hy-Therm AP, ENRGY 3 or PSI-25 or min. 2-inch FlintBoard Iso or ACFoam II	Loose laid	Min. ¹ / ₂ -inch Structodek, FiberBase HD1/HD6 or GP HD Roof Fiberboard	1 fastener per 2 ft ²	Yosemite or Channel Vent spot mopped in hot asphalt in 24-inch diameter spots spaced 30-inch o.c	None	Hot mopped with hot asphalt or heat welded	45.0
B-7	Min. ¹⁹ / ₃₂ -inch plywood at max 24-inch spans attach 6-inch o.c. using 8d ring shank nails	(Optional) One or more layers min. 1.5" ACFoam II, ENRGY 3, H-Shield, Multi-Max FA3 or FlintISO	Loose laid	Min. 1.5" ACFoam II, ENRGY 3, HShield, Multi-Max FA3 or FlintISO	1 fastener per 1.45 ft ²	Flintlastic SA Mid Ply or PlyBase, self-adhered (Substrate Primed with Flint-Prime SA)	(Optional) Flintlastic SA Mid Ply or PlyBase, self-adhered	Self-Adhered	60.0
B-8	Min. 22 ga. Steel or min. 2,500 psi concrete	Min. 1.5-inch Owens-Corning FOAMULAR, Hy-Therm AP, Hy-Therm(a) AP, FlintBoard Iso, ACFOAM-II, ENRGY 3, PSI-25, H-Shield, H-Shield-P, H-Shield-WF, or H-Shield-NB	Loose laid	Min. ¹ / ₄ -inch DensDeck or DensDeck Prime	1 fastener per 2 ft ²	Flintlastic Base 20 T, heat welded	None	Flintlastic FR Cap 30 T, heat welded	45.0
B-9	Tectum 1 Plank (install per ESR-1112) or existing substrate	Min ⁵ / ₈ -inch DensDeck or DensDeck Prime	1 fastener per 4 ft ²	None	N/A	Flintlastic Base 20 T, heat welded	None	Flintlastic FR Cap 30 T, heat welded	45.0
B-10	Existing substrate	Min. ¹ / ₄ -inch DensDeck or DensDeck Prime	1 fastener per 2 ft ²	None	N/A	Flintlastic Base 20 T, heat welded	None	Heat Welded or Flintlastic FR Cap 30 T, heat welded	45.0

**TABLE 2C—WIND UPLIFT RESISTANCE: METHOD OF ATTACHMENT
MECHANICALLY ATTACHED BASE SHEET OVER INSULATION**

SYSTEM NO.	SUBSTRATE	INSULATION ⁵		COVERBOARD ⁵		ROOF COVER ¹			ALLOWABLE UPLIFT CAPACITY (psf) ⁴
		Type	Attach	Type	Attachment Method	Base ²	Ply	Cap	
C-1	Min. 22 ga. steel or min. 2,500 psi concrete	Min. 1.5-inch, min. 2.0 pcf polyisocyanurate	Loose laid	(Optional) FM Approved min. 3/4-inch perlite min. 1/2-inch wood fiberboard or min. 1/4-inch DensDeck	Loose laid	Flexiglas or Flexiglas FR attached 6-inch o.c. in a 4-inch lap and 6-inch o.c. in two, equally spaced, staggered center rows	(Optional) Hot mopped with hot asphalt	Hot mopped with hot asphalt or heat welded	67.5
C-2	Min. 22 ga. steel or min. 2,500 psi concrete	Min. 1.5-inch, min. 2.0 pcf polyisocyanurate	Loose laid	(Optional) FM Approved Min. 3/4-inch perlite min. 1/2-inch wood fiberboard or min. 1/4-inch DensDeck	Loose laid	PolySMS or Ultra Poly SMS attached 12-inch o.c. in a 4-inch lap and 12-inch o.c. in two, equally spaced, staggered center rows	(Optional) Hot mopped with hot asphalt	Hot mopped with hot asphalt or heat welded	120
C-3	Min. 22 ga. steel or min. 2,500 psi concrete	Min. 1.5-inch, min. 2.0 pcf polyisocyanurate	Loose laid	(Optional) FM Approved min. 3/4-inch perlite min. 1/2-inch wood fiberboard or min. 1/4-inch DensDeck	Loose laid	Ultra Poly SMS attached 12-inch o.c. in the 4-inch heat welded lap with Tru-Fast EHD and 2.4" Barbed Seam Plates	None	Heat welded	60
C-4	Min. 22 ga. Steel, min. 2,500 psi concrete or min. 19/32-inch plywood	Min. 1.5-inch, min. 2.0 pcf polyisocyanurate	Loose laid	(Optional) FM Approved min. 3/4-inch perlite min. 1/2-inch wood fiberboard or min. 1/4-inch DensDeck	Loose laid	Flintlastic SA NailBase attached 12-inch o.c. in a 4-inch lap and 12-inch o.c. in two, equally spaced, staggered center rows	(Optional) Flintlastic SA Mid Ply, self-adhered	Self-Adhered	60
C-5	Min. 22 ga. steel or min. 2,500 psi concrete	Max. 3-inch-thick OC FOAMULAR 350 or max. 4-inch-thick Hy-Therm AP, Flintboard Iso, ACFoam II, PSI 25, H-Shield, H-Shield P, H-Shield WF or H-Shield NB.	Loose laid	Min. 1/2-inch Armor Board HD, BP High Strength, ERS Redi-Deck, GAFTEMP HD, Roof Insulation Board, Structodek HD Fiberboard or FiberBase HD1/HD6 or min. 3/4-inch ConPerl, Fesco Board or EnergyGuard Perlite or min. 1/4-inch DensDeck or DensDeck Prime	Presecured ³	CertainTeed base sheet (except Channel Vent) attached 12-inch o.c. in a 4-inch lap and 36-inch o.c. in two, equally spaced, staggered center rows	(Optional) Hot mopped with hot asphalt	Hot mopped with hot asphalt or heat welded	30.0
C-6	Min. 22 ga. steel or min. 2,500 psi concrete	Max. 3-inch-thick OC FOAMULAR 350 or max. 4-inch-thick Hy-Therm AP, Flintboard Iso, ACFoam II, PSI 25, H-Shield, H-Shield P, H-Shield WF or H-Shield NB.	Loose laid	Min. 1/2-inch Armor Board HD, BP High Strength, ERS Redi-Deck, GAFTEMP HD, Roof Insulation Board, Structodek HD Fiberboard or FiberBase HD1/HD6 or min. 3/4-inch ConPerl, Fesco Board or EnergyGuard Perlite or min. 1/4-inch DensDeck or DensDeck Prime	Presecured ³	CertainTeed base sheet (except Channel Vent) attached 12-inch o.c. in a 4-inch lap and 24-inch o.c. in two, equally spaced, staggered center rows	(Optional) Hot mopped with hot asphalt	Hot mopped with hot asphalt or heat welded	45.0
C-7	Min. 22 ga. steel or min. 2,500 psi concrete	Max. 3-inch-thick OC FOAMULAR 350 or max. 4-inch-thick Hy-Therm AP, Flintboard Iso, ACFoam II, PSI 25, H-Shield, H-Shield P, H-Shield WF or H-Shield NB.	Loose laid	Min. 1/2-inch Armor Board HD, BP High Strength, ERS Redi-Deck, GAFTEMP HD, Roof Insulation Board, Structodek HD Fiberboard or FiberBase HD1/HD6 or min. 3/4-inch ConPerl, Fesco Board or EnergyGuard Perlite or min. 1/4-inch DensDeck or DensDeck Prime	Presecured ³	PolySMS Base attached 12-inch o.c. in a 4-inch lap and 36-inch o.c. in two, equally spaced, staggered center rows or 18-inch o.c. in a 4-inch lap and 18-inch o.c. in one staggered center row	(Optional) Hot mopped with hot asphalt	Hot mopped with hot asphalt or heat welded	45.0

**TABLE 2C—WIND UPLIFT RESISTANCE: METHOD OF ATTACHMENT
MECHANICALLY ATTACHED BASE SHEET OVER INSULATION (Continued)**

SYSTEM NO.	SUBSTRATE	INSULATION ⁵		COVERBOARD ⁵		ROOF COVER ¹			ALLOWABLE UPLIFT CAPACITY (psf) ⁴
		Type	Attach	Type	Attachment Method	Base ²	Ply	Cap	
C-8	Min. 22 ga. steel or min. 2,500 psi concrete	Max. 3-inch-thick OC FOAMULAR 350 or max. 4-inch-thick Hy-Therm AP, Flintboard Iso, ACFoam II, PSI 25, H-Shield, H-Shield P, H-Shield WF or H-Shield NB.	Loose laid	Min. 1/2-inch Armor Board HD, BP High Strength, ERS Redi-Deck, GAFTEMP HD, Roof Insulation Board, Structodek HD Fiberboard or FiberBase HD1/HD6 or min. 3/4-inch ConPerl, Fesco Board or EnergyGuard Perlite or min. 1/4-inch DensDeck or DensDeck Prime	Presecured ³	Channel Vent attached 12-inch o.c. in a 4-inch lap and 18-inch o.c. in two, equally spaced, staggered center rows	(Optional) Hot mopped with hot asphalt	Hot mopped with hot asphalt or heat welded	45.0
C-9	Min. 22 ga. steel or min. 2,500 psi concrete	Max. 3-inch-thick OC FOAMULAR 350 or max. 4-inch-thick Hy-Therm AP, Flintboard Iso, ACFoam II, PSI 25, H-Shield, H-Shield P, H-Shield WF or H-Shield NB.	Loose laid	Min. 1/2-inch Armor Board HD, BP High Strength, ERS Redi-Deck, GAFTEMP HD, Roof Insulation Board, Structodek HD Fiberboard or FiberBase HD1/HD6 or min. 3/4-inch ConPerl, Fesco Board or EnergyGuard Perlite or min. 1/4-inch DensDeck or DensDeck Prime	Presecured ³	PolySMS or UltraPoly SMS Base attached with SFS Intec 2 in. round metal plates and #12 or #14 fasteners spaced 12-inch o.c. in a 4-inch wide, heat-welded side lap.	(Optional) Hot mopped with hot asphalt	Hot mopped with hot asphalt or heat welded	45.0
C-10	(Recover) Min. 22 ga. steel or min. 3/4-inch plywood	None	N/A	Min. 1/2-inch to max 1-inch Armor Board HD, BP High Strength, ERS Redi-Deck, GAFTEMP HD, Roof Insulation Board, Structodek HD Fiberboard or FiberBase HD1/HD6 or min. 3/4-inch to max. 1-inch ConPerl, Fesco Board or EnergyGuard Perlite or min. 1/4-inch to max. 1-inch DensDeck or DensDeck Prime	Presecured ³	PolySMS or UltraPoly SMS Base attached with SFS Intec 2 in. round metal plates and #12 or #14 fasteners spaced 12-inch o.c. in a 4-inch wide, heat-welded side lap.	(Optional) Hot mopped with hot asphalt	Hot mopped with hot asphalt or heat welded	45.0
C-11	Min. 22 ga. steel or min. 2,500 psi concrete	1.5-inch min. to 4-inch max. FlintBoard Iso or ACFoam II	Loose laid	Min. 3/4-inch Fesco Board or EnergyGuard Perlite or min. 1/2-inch DensDeck or DensDeck Prime	Presecured ³	Glasbase, Flexiglas or Flexiglas FR attached 6-inch o.c. in a 4-inch lap and 12-inch o.c. in two, equally spaced, staggered center rows (excludes ITW Buildex fasteners & plates)	(Optional) PolySMS or UltraPoly SMS base applied in Karnak No. 81 at 1.5 gal/square	Flintlastic FR-P, Premium FR-P or Flintlastic FR Cap applied in Karnak No. 81 at 1.5 gal/square	45.0
C-12	Min. 19/32-inch plywood at max 24-inch spans attached 6-inches o.c. using #8 wood screws	One or more layers min. 1.5-inch ACFoam II, ENRGY 3, HShield, Multi-Max FA3 or FlintISO	Loose laid	Min. 1/4-inch DensDeck or DensDeck Prime	Presecured ³	Flintlastic SA NailBase attached 8-inches o.c. in a 3-inch lap and 8-inches o.c. in two, equally spaced, staggered center rows 35-inches o.c.	(Optional) Flintlastic SA Mid Ply or PlyBase, self-adhered	Self-Adhered	82.5
C-13	Min. 22 ga. Steel or min. 2,500 psi concrete	Min. 1.5-inch Owens-Corning FOAMULAR, Hy-Therm AP, Hy-Therm(a) AP, FlintBoard Iso, ACFoam-II, ENRGY 3, PSI-25, H-Shield, H-Shield-P, H-Shield-WF, or H-Shield-NB	Loose laid	Min. 1/4-inch DensDeck or DensDeck Prime	Loose laid	Flintlastic Base 20 T attached 12-inches o.c. in a 4-inch lap and 12-inches o.c. in two, equally spaced, staggered center rows 35-inches o.c.	None	Flintlastic FR Cap 30 T, heat welded	30.0

**TABLE 2C—WIND UPLIFT RESISTANCE: METHOD OF ATTACHMENT
MECHANICALLY ATTACHED BASE SHEET OVER INSULATION (Continued)**

SYSTEM NO.	SUBSTRATE	INSULATION ⁶		COVERBOARD ⁶		ROOF COVER ¹			ALLOWABLE UPLIFT CAPACITY (psf) ⁴
		Type	Attach	Type	Attachment Method	Base ²	Ply	Cap	
C-14	Min. 22 ga. Steel or min. 2,500 psi concrete	Min. 1.5-inch Owens-Corning FOAMULAR, Hy-Therm AP, Hy-Therm(a) AP, FlintBoard Iso, ACFOAM-II, ENRGY 3, PSI-25, H-Shield, H-Shield-P, H-Shield-WF, or H-Shield-NB	Loose laid	Min. 1/4-inch DensDeck or DensDeck Prime	Loose laid	Flintlastic Base 20 T attached 12-inches o.c. in a 4-inch lap and 12-inches o.c. in two, equally spaced, staggered center rows 24-inches o.c.	None	Flintlastic FR Cap 30 T, heat welded	45.0

**TABLE 2D—WIND UPLIFT RESISTANCE: METHOD OF ATTACHMENT
MECHANICALLY ATTACHED ANCHOR SHEET FOLLOWED BY BONDED INSULATION**

SYSTEM NO.	SUBSTRATE	ANCHOR SHEET	INSULATION ⁶		COVERBOARD ⁶		ROOF COVER ¹			ALLOWABLE UPLIFT CAPACITY (psf) ⁴
			Type	Attach	Type	Attachment Method	Base	Ply	Cap	
D-1	Min. 19/32-inch plywood	Glasbase or Flintglas Premium Ply Sheet attached with 11 ga. annular ring shank nails & min. 1 7/8-inch dia. tin caps spaced 8-inch o.c. in the 4-inch lap and 8-inch o.c. in three, equally spaced, staggered center rows	(Optional) One or more layers min. 1.5-inch, min. 2.0 pcf polyisocyanurate	Hot asphalt	Min. 3/4-inch FescoBoard or min. 1/2-inch High Density Fiberboard Roof Insulation	Hot asphalt	One to three plies applied in hot asphalt	Hot asphalt or heat welded	60	
D-2	Min. 19/32-inch plywood	Glasbase or Flintglas Premium Ply Sheet attached with 11 ga. annular ring shank nails & min. 1 7/8-inch dia. tin caps spaced 8-inch o.c. in the 4-inch lap and 8-inch o.c. in three, equally spaced, staggered center rows	One or more layers min. 1.5-inch FlintBoard Iso, ACFoam II, ENRGY 3 or Multi-Max FA. Maximum thickness not to exceed 4 inches.	Hot asphalt	None	N/A	Black Diamond Base Sheet, self-adhered	(Optional) One or two plies in hot asphalt	Hot asphalt	52.5
D-3	Same as System No. D-2, using Heat welded cap sheet								Heat welded	60
D-4	Tectum 1 Plank (install per ESR-1112) or Existing substrate	Glasbase, Flexiglas Base, Flexiglas FR Base or All Weather Empire Base attached with Twin Loc-Nails spaced 7-inch o.c. in the 4-inch lap and 7-inch o.c. in two, equally spaced, staggered center rows	(Optional) One or more layers min. 1.5-inch FlintBoard Iso, ACFoam II, ENRGY 3 or Multi-Max FA. Maximum thickness not to exceed 4 inches.	Hot asphalt	Min. 3/4-inch FescoBoard or min. 1/2-inch High Density Fiberboard Roof Insulation	Hot asphalt	One to three plies applied in hot asphalt	Hot asphalt or heat welded	60	
D-5	Tectum 1 Plank (install per ESR-1112) or Existing substrate	Glasbase, Flexiglas Base, Flexiglas FR Base or All Weather Empire Base attached with Twin Loc-Nails spaced 7-inch o.c. in the 4-inch lap and 7-inch o.c. in two, equally spaced, staggered center rows	One or more layers min. 1.5-inch FlintBoard Iso, ACFoam II, ENRGY 3 or Multi-Max FA. Maximum thickness not to exceed 4 inches.	Hot asphalt	None	N/A	Black Diamond Base Sheet, self-adhered	(Optional) One or two plies in hot asphalt	Hot asphalt	52.5
D-6	Same as System No. D-5, using Heat welded cap sheet								Heat welded	60
D-7	Existing substrate	Glasbase, Flexiglas Base, Flexiglas FR Base or All Weather Empire Base attached with Twin Loc-Nails spaced 9-inch o.c. in the 4-inch lap and 9-inch o.c. in two, equally spaced, staggered center rows	(Optional) One or more layers min. 1.5-inch FlintBoard Iso, ACFoam II, ENRGY 3 or Multi-Max FA. Maximum thickness not to exceed 4 inches.	Hot asphalt	Min. 3/4-inch FescoBoard or min. 1/2-inch High Density Fiberboard Roof Insulation	Hot asphalt	One to three plies applied in hot asphalt	Hot asphalt or heat welded	60	

**TABLE 2D—WIND UPLIFT RESISTANCE: METHOD OF ATTACHMENT
MECHANICALLY ATTACHED ANCHOR SHEET FOLLOWED BY BONDED INSULATION (Continued)**

SYSTEM NO.	SUBSTRATE	ANCHOR SHEET	INSULATION ⁶		COVERBOARD ⁶		ROOF COVER ¹			ALLOWABLE UPLIFT CAPACITY (psf) ⁴
			Type	Attach	Type	Attachment Method	Base	Ply	Cap	
D-8	Existing substrate	Glasbase, Flexiglas Base, Flexiglas FR Base or All Weather Empire Base attached with Twin Loc-Nails spaced 9-inch o.c. in the 4-inch lap and 9-inch o.c. in two, equally spaced, staggered center rows	One or more layers min. 1.5-inch FlintBoard Iso, ACFoam II, ENRGY 3 or Multi-Max FA. Maximum thickness not to exceed 4 inches.	Hot asphalt	None	N/A	Black Diamond Base Sheet, self-adhered	(Optional) One or two plies in hot asphalt	Hot asphalt	52.5
D-9	Same as System No. D-8, using Heat welded cap sheet								Heat welded	60
D-10	Tectum 1 Plank (install per ESR-1112) or Existing substrate	Flintlastic Base 20 T fastened with ES Products fasteners	Min. 1/4-inch DensDeck or DensDeck Prime	Hot mopped with hot asphalt	None	N/A	(Optional) One ply of Flintastic Base 20 T, heat welded	(Optional) One ply of Flintastic Base 20 T, heat welded	(Optional) One ply of Flintastic Base 20 T, heat welded	(Optional) One ply of Flintastic Base 20 T, heat welded
D-11	Min. 19/32-inch Plywood at max 24-inch spans attach 6-inches o.c. using 8d ring shank nails	All Weather Empire, Flex-I-Glas, Poly SMS or Ultra PolySMS attached with nails & tin caps spaced 8-inches o.c. at the 3-inch lap and 8-inches o.c. in three, equally spaced center rows	Min. 1.5" ACFoam II, ENRGY 3, HShield, Multi-Max FA3 or FlintISO	Insta-Stick, OlyBond 500, OlyBond Green, Pliodeck, ITESET or WeatherTite One Step Foamable, 4" o.c.	Min. 1/4-inch DensDeck, DensDeck Prime	Insta-Stick, OlyBond 500, OlyBond Green, Pliodeck, TITESET or WeatherTite One Step Foamable, 6" o.c.	One or two layers self-adhered (substrate primed with Flint-Prime SA)	None	Self-adhered	52.5
D-12	Min. 19/32-inch Plywood at max 24-inch spans attach 6-inches o.c. using 8d ring shank nails	All Weather Empire, Flex-I-Glas, Poly SMS or Ultra PolySMS attached with nails & tin caps spaced 8-inches o.c. at the 3-inch lap and 8-inches o.c. in three, equally spaced center rows	Min. 1.5" ACFoam II, ENRGY 3, HShield, Multi-Max FA3 or FlintISO	Insta-Stick, OlyBond 500, OlyBond Green, Pliodeck, ITESET or WeatherTite One Step Foamable, 4-inches o.c.	Min. 1/4-inch Securock	Insta-Stick, OlyBond 500, OlyBond Green, Pliodeck, TITESET or WeatherTite One Step Foamable, 6" o.c.	One or two layers self-adhered (substrate primed with Flint-Prime SA)	None	Self-adhered	60.0
D-13	Min. 19/32-inch Plywood at max 24-inch spans attach 6-inches o.c. using 8d ring shank nails	All Weather Empire, Flex-I-Glas, Poly SMS or Ultra PolySMS attached with nails & tin caps spaced 8-inches o.c. at the 3-inch lap and 8-inches o.c. in three, equally spaced center rows	Min. 1.5" ACFoam II, ENRGY 3, HShield, Multi-Max FA3 or FlintISO	Insta-Stick, OlyBond 500, OlyBond Green, Pliodeck, ITESET or WeatherTite One Step Foamable, 4-inches o.c.	None	N/A	One or two layers Self-Adhered (Substrate Primed with Flint-Prime SA)	None	Self-adhered	60.0

**TABLE 2E—WIND UPLIFT RESISTANCE: METHOD OF ATTACHMENT
MECHANICALLY ATTACHED BASE SHEET, NONINSULATED**

SYSTEM NO.	SUBSTRATE	ROOF COVER ¹			ALLOWABLE UPLIFT CAPACITY (psf) ⁴
		Base	Ply	Cap	
E-1	Min. 19/32-inch plywood	Glasbase or Flintglas Premium Ply Sheet attached with 11 ga. annular ring shank nails & min. 1 5/8-inch dia. tin caps spaced 8-inch o.c. in the 4-inch lap and 8-inch o.c. in three, equally spaced, staggered center rows	(Optional) One or two plies in hot asphalt	Hot asphalt or heat welded	60.0
E-2	Min. 7/16-inch OSB, min. 15/32-inch plywood or min. 1-inch dimensional lumber	Glasbase or All Weather Empire Base attached with Tru-Fast Cap Nails spaced 6-inch o.c. in the 3-inch lap and 6-inch o.c. in three, equally spaced, staggered center rows	(Optional) One or two plies in hot asphalt	Hot asphalt or heat welded	45.0
E-3	Min. 15/32-inch OSB, min. 19/32-inch plywood or min. 1-inch dimensional lumber	Glasbase or All Weather Empire Base attached with Tru-Fast Cap Nails spaced 6-inch o.c. in the 3-inch lap and 6-inch o.c. in two, equally spaced, staggered center rows	(Optional) One or two plies in hot asphalt	Hot asphalt or heat welded	45.0
E-4	Min. 15/32-inch OSB, min. 19/32-inch plywood or min. 1-inch dimensional lumber	Glasbase or All Weather Empire Base attached with Tru-Fast Cap Nails spaced 6-inch o.c. in the 3-inch lap and 6-inch o.c. in three, equally spaced, staggered center rows	(Optional) One or two plies in hot asphalt	Hot asphalt or heat welded	52.5
E-5	Min. 19/32-inch OSB, min. 19/32-inch plywood or min. 1-inch dimensional lumber	Glasbase or All Weather Empire Base attached with Tru-Fast Cap Nails spaced 9-inch o.c. in the 3-inch lap and 9-inch o.c. in two, equally spaced, staggered center rows	(Optional) One or two plies in hot asphalt	Hot asphalt or heat welded	30.0
E-6	Min. 19/32-inch OSB, min. 19/32-inch plywood or min. 1-inch dimensional lumber	Glasbase or All Weather Empire Base attached with Tru-Fast Cap Nails spaced 6-inch o.c. in the 3-inch lap and 6-inch o.c. in three, equally spaced, staggered center rows	(Optional) One or two plies in hot asphalt	Hot asphalt or heat welded	75.0
E-7	Min. 1-inch dimensional lumber	Glasbase or All Weather Empire Base attached with Tru-Fast Cap Nails spaced 6-inch o.c. in the 3-inch lap and 9-inch o.c. in two, equally spaced, staggered center rows	(Optional) One or two plies in hot asphalt	Hot asphalt or heat welded	52.5
E-8	Min. 19/32-inch plywood	Flintlastic SA NailBase attached with 11 ga. annular ring shank nails and 1 5/8" tin caps spaced 8-inch o.c. in the 3-inch lap and 8-inch o.c. in three, equally spaced, staggered center rows	(Optional) Flintlastic SA Mid Ply, self-adhered	Flintlastic SA Cap-FR, self-adhered	60.0
E-9	Tectum 1 Plank (install per ESR-1112) or existing substrate	Glasbase, Flexiglas Base, Flexiglas FR Base or All Weather Empire Base attached with Twin Loc-Nails spaced 7-inch o.c. in the 4-inch lap and 7-inch o.c. in two, equally spaced, staggered center rows	(Optional) One or two plies in hot asphalt	Hot asphalt or heat welded	67.5
E-10	Tectum 1 Plank (install per ESR-1112) or existing substrate	Flintlastic SA NailBase attached with Twin Loc-Nails spaced 7-inch o.c. in the 4-inch lap and 7-inch o.c. in two, equally spaced, staggered center rows	(Optional) Flintlastic SA Mid Ply, self-adhered	Self-Adhered	60.0
E-11	Existing substrate	Glasbase, Flexiglas Base, Flexiglas FR Base or All Weather Empire Base attached with Twin Loc-Nails spaced 9-inch o.c. in the 4-inch lap and 9-inch o.c. in two, equally spaced, staggered center rows	(Optional) One or two plies in hot asphalt or Flintlastic SA Mid Ply, self-adhered	Hot asphalt, heat welded or self-adhered	60.0

**TABLE 2F—WIND UPLIFT RESISTANCE: METHOD OF ATTACHMENT
ALL LAYERS BONDED, INSULATED OR NONINSULATED**

SYSTEM NO.	SUBSTRATE	VAPOR BARRIER	INSULATION ⁶		COVERBOARD ⁶		ROOF COVER ¹			ALLOWABLE UPLIFT CAPACITY (psf) ⁴
			Type	Attach ⁵	Type	Attach ⁵	Base	Ply	Cap	
F-1	Min. 2,500 psi concrete primed with ASTM D41 primer	(Optional) Two plies D2178, type IV or VI in hot asphalt	(Optional) One or more layers FlintBoard Iso or ACFoam II not to exceed 4 inches in thickness.	Hot asphalt	Min. 1/2-inch DuraBoard or min. 3/4-inch FescoBoard	Hot asphalt	One to three plies applied in hot asphalt		Hot asphalt or heat welded	412
F-2	Min. 2,500 psi concrete primed with ASTM D41 primer or unprimed	None	One or more layers FlintBoard Iso, ACFoam II, ENRGY 3 or Multi-Max FA not to exceed 4 inches in thickness.	Hot asphalt or TITASET	Min. 1/4-inch DensDeck primed with FlintPrime SA at 0.3 gal/sq.	Hot asphalt or TITASET	Flintlastic SA Mid Ply, self-adhered	(Optional) Flintlastic SA Mid Ply, self-adhered	Self-Adhered	192.5
F-3	Min. 2,500 psi concrete primed with ASTM D41 primer or unprimed	None	One or more layers FlintBoard Iso or ACFoam II not to exceed 4 inches in thickness	Insta-Stik or Spray-N-Grip	Min. 1/4-inch DensDeck primed with FlintPrime SA at 0.3 gal/sq.	Insta-Stik or Spray-N-Grip	Flintlastic SA Mid Ply, self-adhered	(Optional) Flintlastic SA Mid Ply, self-adhered	Self-Adhered	120
F-4	Min. 2,500 psi concrete primed with ASTM D41 primer or unprimed	None	One or more layers ENRGY 3 not to exceed 4 inches in thickness	Insta-Stik or Spray-N-Grip	Min. 1/4-inch DensDeck primed with FlintPrime SA at 0.3 gal/sq.	Insta-Stik or Spray-N-Grip	Flintlastic SA Mid Ply, self-adhered	(Optional) Flintlastic SA Mid Ply, self-adhered	Self-Adhered	112.5
F-5	Min. 2,500 psi concrete primed with ASTM D41 primer or unprimed	None	One or more layers Multi-Max FA not to exceed 4 inches in thickness	Insta-Stik or Spray-N-Grip	Min. 1/4-inch DensDeck primed with FlintPrime SA at 0.3 gal/sq.	Insta-Stik or Spray-N-Grip	Flintlastic SA Mid Ply, self-adhered	(Optional) Flintlastic SA Mid Ply, self-adhered	Self-Adhered	67.5
F-6	Min. 2,500 psi concrete	None	One or more layers FlintBoard Iso, ACFoam II, ENRGY 3 or Multi-Max FA not to exceed 4 inches in thickness	Weather-Tite Pourable Foam Insulation Adhesive	Min. 1/4-inch DensDeck primed with FlintPrime SA at 0.3 gal/sq.	Weather-Tite Pourable Foam Insulation Adhesive	Flintlastic SA Mid Ply, self-adhered	(Optional) Flintlastic SA Mid Ply, self-adhered	Self-Adhered	135
F-7	Min. 2,500 psi concrete	None	One or more layers FlintBoard Iso, ACFoam II, ENRGY 3 or Multi-Max FA not to exceed 4 inches in thickness	Weather-Tite One-Step Foamable Adhesive	Min. 1/4-inch DensDeck primed with FlintPrime SA at 0.3 gal/sq.	Weather-Tite One-Step Foamable Adhesive	Flintlastic SA Mid Ply, self-adhered	(Optional) Flintlastic SA Mid Ply, self-adhered	Self-Adhered	192.5
F-8	Min. 2,500 psi concrete	None	(Optional) One or more layers FlintBoard Iso or ACFoam II not to exceed 4 inches in thickness	OlyBond 500	Min. 1/4-inch DensDeck primed with FlintPrime SA at 0.3 gal/sq.	OlyBond 500	Flintlastic SA Mid Ply, self-adhered	(Optional) Flintlastic SA Mid Ply, self-adhered	Self-Adhered	150
F-9	Min. 2,500 psi concrete primed with ASTM D41 primer	None	(Optional) One or more layers FlintBoard Iso or ACFoam II not to exceed 4 inches in thickness	OlyBond 500	Min. 1/4-inch DensDeck primed with FlintPrime SA at 0.3 gal/sq.	OlyBond 500	Flintlastic SA Mid Ply, self-adhered	(Optional) Flintlastic SA Mid Ply, self-adhered	Self-Adhered	120
F-10	Min. 2,500 psi concrete primed with ASTM D41 primer or FlintPrime SA	None	None	N/A	None	N/A	Flintlastic SA Mid Ply, self-adhered	(Optional) Flintlastic SA Mid Ply, self-adhered	Self-Adhered	550

**TABLE 2F—WIND UPLIFT RESISTANCE: METHOD OF ATTACHMENT
ALL LAYERS BONDED, INSULATED OR NONINSULATED (Continued)**

SYSTEM NO.	SUBSTRATE	VAPOR BARRIER	INSULATION ⁶		COVERBOARD ⁶		ROOF COVER ¹			ALLOWABLE UPLIFT CAPACITY (psf) ⁴
			Type	Attach ⁵	Type	Attach ⁵	Base	Ply	Cap	
F-11	Min. 2,500 psi concrete primed with ASTM D 41 primer or unprimed	None	None	N/A	None	N/A	Flintlastic Base 20 T, heat-welded	None	Flintlastic FR Cap 30 T, heat-welded	450.0
F-12	Min. 2,500 psi concrete primed with ASTM D 41 primer or unprimed	None	Min. 1.5-inch Flintboard Iso	Hot mopped with hot asphalt	Min. 1/4-inch DensDeck or DensDeck Prime	Hot mopped with hot asphalt	Flintlastic Base 20 T, heat-welded	None	Flintlastic FR Cap 30 T, heat-welded	480.0
F-13	Min. ¹⁹ / ₃₂ " plywood at max 24-inch spans attach 6-inches o.c. using #8 wood screws primed with FlintPrime SA	None	None	N/A	None	N/A	Flintlastic SA Mid Ply or PlyBase, self-adhered	None	Self-adhered	127.5

For SI: 1 inch = 25.4mm, 1 psf = 47.88 Pa, 1 gal/sq. = 0.41 l/m², 1 psi = 6.89 kPa.

Footnotes for Table 2A thru Table 2F, as applicable:

¹Unless otherwise noted, base sheets, ply sheets and cap sheets are as follows:

- **Base:** GLASBASE Base Sheet, FLEXIGLAS Base Sheet, FLEXIGLAS FR Base Sheet, All Weather/Empire Base Sheet, POLY SMS Base Sheet, ULTRA POLY SMS, FLINTGLAS Ply Sheet (Type IV), FLINTGLAS Premium Ply Sheet (Type VI) or Channel Vent
- **Ply:** GLASBASE Base Sheet, FLEXIGLAS Base Sheet, FLEXIGLAS FR Base Sheet, All Weather/Empire Base Sheet, POLY SMS Base, ULTRA POLY SMS, FLINTGLAS Ply Sheet (Type IV) or FLINTGLAS Premium Ply Sheet (Type VI),
- **Cap:** Hot Asphalt Applied: FLINTLASTIC GMS, FLINTLASTIC Premium GMS, FLINTLASTIC FR-P, FLINTLASTIC Premium FR-P, FLINTLASTIC FR Cap Sheet. Heat Welded: FLINTLASTIC STA, FLINTLASTIC STA Plus, FLINTLASTIC GTA, FLINTLASTIC GTA White Diamond, FLINTLASTIC GTA FR, FLINTLASTIC GTS. Self-Adhered: Flintlastic SA Cap-FR

² Unless otherwise noted, fasteners and plates must be as noted in Table 3.

³Preliminary securement consists of four fasteners per board for boards having any dimension greater than 4 ft and two fasteners per board for boards having a maximum dimension of 4 ft.

⁴For mechanically fastened insulation, coverboards or base sheets the uplift capacity shall meet or exceed Zone 1 roof cladding design pressure requirements, 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. For bonded assemblies, the uplift capacity shall meet or exceed the critical roof cladding design pressure requirements (Zone 2 or 3).

⁵Bonded polyisocyanurate insulation boards must have a maximum 4 x 4 ft dimension. 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 ³/₄ 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 ³/₄ inch wide strips spaced max. 12" o.c.
- Millennium Weather-Tite One Step Insulation Adhesive applied in ³/₄ inch diameter beads spaced max. 12" o.c.
- Olympic OlyBond 500 applied in ³/₄ inch diameter beads spaced max. 12" o.c.
- Polyfoam Products TITSEET spray applied in continuous 3 inch wide ribbons spaced max. 12" o.c.

⁶Polyisocyanurate insulation must comply with ASTM C 1289, Type I or Type II. Perlite insulation must comply with ASTM C 728. Wood Fiberboard insulation must comply with ASTM C 2089.

TABLE 3—INSULATION AND BASE SHEET FASTENERS AND PLATES

DECK TYPE	ATTACHING	FASTENER	PLATE
Wood or Steel	Insulation or Base Sheet	SFS Intec Dekfast #12, #14 or #15	Dekfast Galvalume Steel 3 in. Round or Dekfast Galvalume Hex
		OMG Standard or HD	OMG 3 in. Galvalume Steel Plate or OMG 3 in. Ribbed Plate
		ITW Buildex #12 or #14-10 Roofgrip	AccuTrac, AccuTrac Flat Bottom or Flat Bottom Metal Plate
		Tru-Fast TP, DP, HD or Ultra SS	Tru-Fast MP-3
		Tru-Fast DP-H	Tru-Fast MPH-3
		CertainTeed FlintFast #12 or #14 Fastener	FlintFast 3" Insulation Plate
Concrete	Insulation or Base Sheet	SFS Intec Dekfast #14 or Dekspike	Dekfast Galvalume Steel 3 in. Round or Dekfast Galvalume Hex
		OMG HD or CD-10	OMG 3 in. Galvalum Steel Plate or OMG 3 in. Ribbed Plate
		ITW Buildex #14-10 Roofgrip	AccuTrac, AccuTrac Flat Bottom or Flat Bottom Metal Plate
		Tru-Fast HD or CF TapGrip	Tru-Fast MP-3
		Tru-Fast DP-H	Tru-Fast MPH-3
		CertainTeed FlintFast #14 Fastener	FlintFast 3" Insulation Plate