

ICC-ES Evaluation Report**ESR-1013**

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**DIVISION: 07—THERMAL AND MOISTURE PROTECTION
Section: 07550—Modified Bituminous Sheet Roofing****REPORT HOLDER:****TAMKO BUILDING PRODUCTS, INC.**
POST OFFICE BOX 1404
JOPLIN, MISSOURI 64802
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www.tamko.com**EVALUATION SUBJECT:****TAMKO MODIFIED BITUMEN ROOF COVERING
SYSTEMS****1.0 EVALUATION SCOPE****Compliance with the following codes:**

- 2006 *International Building Code*® (IBC)
- 2006 *International Residential Code*® (IRC)
- 1999 *Standard Building Code*® (SBC)

Properties evaluated:

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

2.0 USES

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

3.0 DESCRIPTION**3.1 General:**

TAMKO roofing membranes are styrene butadiene styrene (SBS) modified bitumen Type 1 or Type II, Grade G, membranes complying with ASTM D 6164, intended for hot asphalt or self-adhered applications. Roof covering systems utilizing TAMKO roofing membranes consist of the Awaplan membranes, base and cap sheets and ply sheets, approved insulation, flashing, asphalts, and mechanical fasteners that are installed to produce an integrated roof system.

3.2 Membranes:

3.2.1 Awaplan Premium: Awaplan Premium is a 0.15-inch-thick (3.8 mm), granular-surfaced, reinforced, modified bitumen roofing membrane manufactured from a nonwoven polyester fabric impregnated and covered with SBS modified bitumen. The membrane weighs approximately 8 pounds per square yard (4.3 kg/m²).

3.2.2 Awaplan Premium FR: Awaplan Premium FR is a 0.155-inch-thick (3.94 mm), granular-surfaced, reinforced, modified bitumen roofing membrane manufactured from a nonwoven polyester fabric impregnated and covered with SBS modified bitumen. The membrane weighs approximately 8 pounds per square yard (4.3 kg/m²).

3.2.3 Awaplan 170: Awaplan 170 is a 0.145-inch-thick (3.6 mm), granular-surfaced, reinforced, modified bitumen roofing membrane manufactured from a nonwoven polyester fabric impregnated and covered with SBS modified bitumen. The membrane weighs approximately 7.7 pounds per square yard (4.2 kg/m²).

3.2.4 Awaplan 170 FR: Awaplan 170 FR is a 0.145-inch-thick (3.6 mm), granular-surfaced, reinforced, modified bitumen roofing membrane manufactured from a nonwoven polyester fabric impregnated and covered with SBS modified bitumen. The membrane weighs approximately 7.7 pounds per square yard (4.2 kg/m²).

3.2.5 Self-Adhering SBS Modified Base Sheet: The 61-mil thick [0.061-inch (1.55 mm)] base sheet is a flexible, fiberglass-reinforced, self-adhering, rubberized asphalt sheet membrane with a polymer film on the top surface and a removable treated release film on the bottom adhesive side.

3.2.6 Self-Adhering SBS Modified Cap Sheet: The 142-mil-thick [0.142-inch (3.61 mm)] cap sheet is a lightweight, flexible, dual-coated, SBS modified sheet membrane consisting of a nonwoven polyester mat with a self-adhering bottom adhesive side protected with a split removable release film and a top surface coated with ceramic granules for protection from ultraviolet degradation.

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. See Tables 1 and 2 for insulation types and thicknesses 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 2, unless otherwise noted.

3.5 Impact Resistance:

The TAMKO 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 TAMKO 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. TAMKO roofing membranes are components of roof covering systems that may be installed over new or existing roofs as described in Tables 1 and 2.

The roof slope must be a minimum of $1/4:12$ (2 percent slope) and must not be more than the maximum slope for the particular system as specified in Table 1.

Penetrations and terminations of the roof covering must be flashed and made weathertight in accordance with the TAMKO Building Products, Inc., published installation instructions and the applicable code.

4.2 Fire Classification:

4.2.1 New Construction: Roof covering systems described in Table 1, 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 SBC Section 1510, and approval from the code official having jurisdiction, are required.

TAMKO 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 TAMKO membrane roof covering systems described in this report have a maximum allowable wind uplift **capacity** as shown in Table 2. 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. Reroofing with TAMKO adhered systems is outside the scope of this report.

5.0 CONDITIONS OF USE

The TAMKO 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 TAMKO Building Products, Inc.
- 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 or SBC Section 2603.5.1.5, as applicable, except when specifically recognized in an ICC-ES evaluation report as outlined in Footnote 3 of Table 1.
- 5.4** 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. Total thickness of foam plastic insulation must be limited to the lesser of the maximum thickness allowed in Tables 1 and 2 or the maximum thickness that limits the flame-spread index to not more than 75 when tested in accordance with ASTM E 84.
- 5.5** 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 Table 2.
- 5.6** The allowable wind-uplift pressures shown in Table 2 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.
- 5.7** Calculations demonstrating that the required wind resistance is less than the allowable wind resistance must be submitted to the code official for approval.
- 5.8** When application is over existing roofs, documentation of the wind-uplift resistance of the composite roof construction must be submitted to the code official.
- 5.9** The membranes are manufactured in Joplin, Missouri, under a quality control program with inspections by Underwriters Laboratories Inc. (AA-668).

6.0 EVIDENCE SUBMITTED

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

7.0 IDENTIFICATION

Each roll of TAMKO roofing membrane covered by this report is labeled with the TAMKO Building Products, Inc., name and address, product name, date code, evaluation report number (ESR-1013) and the name of the inspection agency (Underwriters Laboratories Inc.).

TABLE 1—EXTERNAL ROOF FIRE CLASSIFICATIONS^{1,6}

SYSTEM NO.	DECK ⁵	CLASS	MAXIMUM ROOF SLOPE	INSULATION/ THICKNESS ^{2,3,7}	ROOF COVER		
					Base Sheet ⁴	Ply Sheet ⁴	Membrane
1	NC	A	3/4:12	Perlite, glass fiber, wood fiber, polyisocyanurate, urethane, or polystyrene, any combination, any thickness (HM)	One or more layers of Tam-Glass Premium, Tam-Ply, Vapor-Chan, Glass-Base, 43 lb. Base Sheet, Vent-Ply, Awaplan Premium Smooth FR, or Versa Base (HM)	None	Awaplan Premium FR or Awaplan 170 FR (HM)
2	NC	A	1:12	Perlite, glass fiber, wood fiber, polyisocyanurate, urethane or polystyrene, any thickness (HM)	One or more layers of Versa-Base FR (HM)	None	Awaplan Premium FR or Awaplan 170 FR (HM)
3	C	A	1/4:12	Perlite, glass fiber or wood fiber, minimum of 1 inch thick (HM)	One or more layers of Versa-Base (HM)	None	Awaplan Premium FR or Awaplan 170 FR (HM)
4	C	A	1/4:12	(Optional) Fiber glass or foam glass, any thickness (HM)	Versa-Base FR (HM)	Tam-Glass Premium (HM)	Awaplan Premium FR or Awaplan 170 FR (HM)
5	C	A	1/4:12	Perlite or wood fiber, minimum of 1 inch thick (HM)	Versa-Base FR (HM)	Tam-Glass Premium (HM)	Awaplan Premium FR or Awaplan 170 FR (HM)
6	C	B	1/4:12	(Optional) Glass fiber or foam glass, any thickness (HM)	Tam-Cap (inverted) or Vapor-Chan (HM)	None	Awaplan Premium FR or Awaplan 170 FR (HM)
7	C	B	1/4:12	Perlite, wood fiber or glass fiber, minimum of 1 inch thick (HM)	Tam-Cap (inverted) or Vapor-Chan (HM)	None	Awaplan Premium FR or Awaplan 170 FR (HM)
8	C	B	1:12	Perlite, wood fiber or glass fiber, minimum of 1 inch thick (HM)	One or more layers of Versa-Base (HM)	None	Awaplan Premium FR or Awaplan 170 FR (HM)
9	C	B	1/2:12	Perlite, wood fiber or glass fiber, minimum of 1 inch thick (HM)	One or more layers of Tam-Glass Premium, Tam-Ply IV, Vapor-Chan, Glass-Base, 43 lb. Base Sheet or Versa-Base (HM)	None	Awaplan Premium FR or Awaplan 170 FR (HM)
10	C	B	1/4:12	Polystyrene, minimum of 1 inch thick (MA), and perlite or wood fiber, minimum of 1 inch thick (MA)	One or more layers of Versa-Base (HM)	None	Awaplan Premium FR or Awaplan 170 FR (HM)
11	C	B	1/4:12	(Optional) Glass fiber or perlite, any thickness (MA)	One or more layers of Glass-Base; (HM) or (MA)	None	Awaplan Premium FR or Awaplan 170 FR (HM)
12	NC	C	1/2:12	(Optional) Perlite, glass fiber, wood fiber, phenolic, polyisocyanurate, urethane, polystyrene; any combination any thickness (HM)	One or more layers of Tam-Glass Premium, Tam-Ply IV, Vapor-Chan, Glass Base, 43 lb. Base sheet, Vent-Ply or Awaflex (HM)	None	Awaplan Premium or Awaplan 170 (HM)
13	C	C	1:12	N/A	SA Base	None	SA Cap

For SI: 1 inch = 25.4 mm.

¹Vapor barriers, insulation, base sheets, ply sheets and membranes 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.

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.

⁵Combustible (C) wood decks must be minimum 15/32-inch-thick (11.9 mm) APA rated plywood; 7/16-inch-thick (11.1 mm) nonveneer APA rated oriented strand board; or 3/4-inch-thick (19 mm) sheathing boards. Noncombustible (NC) steel decks must be minimum No. 22 gage galvanized steel [0.030 inch (0.76 mm)]. Noncombustible (NC) concrete decks must have a minimum compressive strength (*f_c*) of 2,500 psi. See Section 5.7 of this report.

⁶Abbreviations:

(C) Combustible

(NC) Noncombustible

(MA) Mechanically attached

(HM) Hot mopped with hot roofing asphalt conforming to ASTM D 312, Type III or IV. Hot mopping is full coverage of hot roofing asphalt at the rate of 20 to 25 pounds per 100 square feet.

⁷Roof insulations must comply with the applicable material standards specified in IBC Table 1508.2 or IRC Table R906.2.

TABLE 2—WIND UPLIFT RESISTANCE: METHOD OF ATTACHMENT³

SYSTEM NO.	SUBSTRATE	ANCHOR SHEET OR THERMAL BARRIER ¹	INSULATION ^{1,2,4}	COVERBOARD	ROOF COVER			ALLOWABLE UPLIFT CAPACITY (psf)
					Base Sheet	Ply Sheet	Membrane or Coating	
1	Concrete, min. 2500 psi	None	(Optional) Any combination, any thickness, glass-faced polyisocyanurate, polystyrene, cellular glass, wood fiber or perlite (HM)	None	One or more layers of Type G1, Type G2, Type 15, Type 30, Versa-Base, Versa-Smooth or Base-N-Ply (HM)	(Optional) One or more layers of Type G1, Type G2, Type 15 or Type 30 (HM)	One or more layers of Awaplan Premium, Awaplan Premium FR, Awaplan 170 or Awaplan 170 FR (HM)	80
2	Steel, min. 22 gage	Thermal barrier - 5/8-inch-thick gypsum board (MA)	Any glass-faced polyisocyanurate, min. 1.3 inches thick (HM)	Min. 1/2-inch-thick high-density wood fiber or perlite board (HM)	One or more layers of Type G1, Type G2, Type 15, Type 30, Versa-Base, Versa-Smooth or Base-N-Ply (HM)	(Optional) One or more layers of Type G1, Type G2, Type 15 or Type 30 (HM)	One or more layers of Awaplan Premium, Awaplan Premium FR, Awaplan 170 or Awaplan 170 FR (HM)	60
3	APA rated plywood, min. 15/32-inch-thick (11.9 mm)	Anchor sheet of Base-N-Ply or Vapor-Chan (MA)	(Optional) Any combination, any thickness, glass fiber polyisocyanurate, polystyrene, cellular glass, wood fiber or perlite (HM)	None	(Optional) One or more layers of Type G1, Type G2, Type 15 or Type 30 (HM)	None	One or more layers of Awaplan Premium FR or Awaplan 170 FR (HM)	55
4	Steel, min. 22 gage	None	Any glass-faced polyisocyanurate, min. 1.3 inches thick (MA)	Min. 1/2-inch-thick high-density wood fiber or perlite board (HM)	One or more layers of Type G1, Type G2, Type 15, Type 30, Versa-Base or Versa-Smooth (HM)	(Optional) One or more layers of Type G1, Type G2, Type 15 or Type 30 (HM)	One or more layers of Awaplan Premium, Awaplan Premium FR, Awaplan 170 or Awaplan 170 FR (HM)	52
5	Steel, min. 22 gage	Thermal barrier - 5/8-inch-thick gypsum board (MA)	Any glass-faced polyisocyanurate, min. 1.5 inches thick, min. 1.0 pcf density (HM)	Min. 1/2-inch-thick high-density wood fiber board (HM)	One or more layers of Type G1, Type G2, Type 15, Type 30, Versa-Base or Versa-Smooth (HM)	(Optional) One or more layers of Type G1, Type G2, Type 15 or Type 30 (HM)	One or more layers of Awaplan Premium, Awaplan Premium FR, Awaplan 170 or Awaplan 170 FR (HM)	45
6	Gypsum	Anchor sheet of Glass-Base, Vapor-Chan or Base-N-Ply (MA)	(Optional) Any combination, any thickness, glass-faced polyisocyanurate, polystyrene, cellular glass, wood fiber, or perlite (HM)	None	(Optional) One or more layers of Type G1, Type G2, Type 15 or Type 30 (HM)	None	One or more layers of Awaplan Premium, Awaplan Premium FR, Awaplan 170 or Awaplan 170 FR (HM)	45
7	Insulating concrete (cellular, vermiculite or perlite)	Anchor sheet of Glass-Base, Vapor-Chan or Base-N-Ply (MA)	(Optional) Any combination, any thickness, glass-faced polyisocyanurate, polystyrene, cellular glass, wood fiber, or perlite (HM)	None	(Optional) One or more layers of Type G1, Type G2, Type 15 or Type 30 (HM)	None	One or more layers of Awaplan Premium, Awaplan Premium FR, Awaplan 170 or Awaplan 170 FR (HM)	45
8	Steel, min. 22 gage	None	Any glass-faced polyisocyanurate, min. 1.3 inches thick (MA)	None	One or more layers of Type G1, Type G2, Type 15, Type 30, Versa-Base or Versa-Smooth (SM)	None	One or more layers of Awaplan Premium, Awaplan Premium FR, Awaplan 170 or Awaplan 170 FR (HM)	45
9	Steel, min. 22 gage	None	Min. 1-inch-thick perlite (MA)	None	One layer of Glass-Base or Versa-Base (HM)	None	Awaplan Premium FR (HM)	45
10	Steel, min. 22 gage	None	Min. 1-inch-thick perlite (MA)	None	One or two layers of Tam-Ply IV or Tam-Glass Premium (HM)	None	Awaplan Premium FR (HM)	45
11	Steel, min. 22 gage	None	Min. 1-inch-thick perlite (MA)	None	One or two or three layers of Tam-Ply IV or Tam-Glass Premium (HM)	None	Awaplan Premium FR (HM)	45

(Continued)

TABLE 2—WIND UPLIFT RESISTANCE: METHOD OF ATTACHMENT³ (Continued)

SYSTEM NO.	SUBSTRATE	ANCHOR SHEET OR THERMAL BARRIER ¹	INSULATION ^{1,2,4}	COVERBOARD	ROOF COVER			ALLOWABLE UPLIFT CAPACITY (psf)
					Base Sheet	Ply Sheet	Membrane or Coating	
12	Steel, min. 22 gage	None	Min. 1-inch-thick perlite roof insulation (top layer) applied over min. 1.3-inch-thick polyisocyanurate insulation (MA)	None	One layer of Glass-Base or Versa-Base (HM)	None	Awaplan Premium FR (HM)	45
13	Steel, min. 22 gage	None	Min. 1-inch-thick perlite roof insulation (top layer) applied over min. 1.3-inch-thick polyisocyanurate insulation (MA)	None	One or two layers of Tam-Ply IV or Tam-Glass Premium (HM)	None	Awaplan Premium FR (HM)	45
14	Steel, min. 22 gage	None	Min. 1-inch-thick perlite roof insulation (top layer) applied over min. 1.3-inch-thick polyisocyanurate insulation (MA)	None	One, two or three layers of Tam-Ply IV or Tam-Glass Premium (HM)	None	Awaplan Premium FR (HM)	45
15	Steel, min. 22 gage	None	Min. 1-inch-thick wood fiberboard roof insulation (top layer) applied over min. 1.3-inch-thick polyisocyanurate insulation (MA)	None	One layer of Glass-Bass or Versa-Base (HM)	None	Awaplan Premium FR (HM)	45
16	Steel, min. 22 gage	None	Min. 1-inch-thick wood fiberboard roof insulation (top layer) applied over min. 1.3-inch-thick polyisocyanurate insulation (MA)	None	One layer of Tam-Ply IV or Tam-Glass Premium (HM)	None	Awaplan Premium FR (HM)	45
17	Concrete, min. 2500 psi	None	Min. 1-inch-thick perlite or wood fiberboard roof insulation (MA)	None	One layer of Glass-Base or Versa-Base (HM)	None	Awaplan Premium FR (HM)	45
18	Concrete, min. 2500 psi	None	Min. 1-inch-thick perlite or wood fiberboard roof insulation (MA)	None	One or two layers of Tam-Ply IV or Tam-Glass Premium (HM)	None	Awaplan Premium FR (HM)	45
19	Concrete, min. 2500 psi	None	Min. 1-inch-thick perlite or wood fiberboard roof insulation (MA)	None	One, two or three layers of Tam-Ply IV or Tam-Glass Premium (HM)	None	Awaplan Premium FR (HM)	45
20	Concrete, min. 2500 psi	None	Min. 1-inch-thick perlite or wood fiberboard roof insulation (top layer) applied over min. 1.3-inch-thick polyisocyanurate insulation (MA)	None	One layer of Glass-Base or Versa-Base (HM)	None	Awaplan Premium FR (HM)	45
21	Concrete, min. 2500 psi	None	Min. 1-inch-thick perlite or wood fiberboard roof insulation (top layer) applied over min. 1.3-inch-thick polyisocyanurate insulation (MA)	None	One or two layers of Tam-Ply IV or Tam-Glass Premium (HM)	None	Awaplan Premium FR (HM)	45
22	Concrete, min. 2500 psi	None	Min. 1-inch-thick perlite or wood fiberboard roof insulation (top layer) applied over min. 1.3-inch-thick polyisocyanurate insulation (MA)	None	One, two or three layers of Tam-Ply IV or Tam-Glass Premium (HM)	None	Awaplan Premium FR (HM)	45
23	Plywood – ¹⁵ / ₃₂ In thick	N/A	N/A	N/A	SA Base ⁵	None	SA Cap	45
24	Plywood – ¹⁵ / ₃₂ In thick	N/A	N/A	N/A	SA Base adhered to asphalt primed deck	None	SA Cap	105

For SI: 1 inch = 25.4 mm.

(Continued)

TABLE 2—WIND UPLIFT RESISTANCE: METHOD OF ATTACHMENT³ (Continued)

¹Fasteners for mechanically fastened gypsum board, insulation or anchor sheets must be as follows:

- Systems 2, 4, 5, 8. Sixteen fasteners per each 4 × 8 sheet, equally spaced and, positioned in three rows. The outer two rows are located 6 inches from the edge of the 8-foot sides, with the inner row located along the centerline. Six fasteners must be used in each outer row and four fasteners must be used in the center row. Any of the following fastener systems may be used:
 - A. FABCO "System ES" consisting of a No. 13 screw and a 3-inch plastic plate.
 - B. DEKFAST No. 12 or No. 14 stand-off screw with a 2⁷/₈-inch coated hex-plate, 0.017 inch minimum thickness.
 - C. BUILDEX Hextra screws with Gearlok locking 3-inch-diameter plastic plates or nominally 3-inch-by-3-inch galvanized steel plates identified as Hextra/accutrac plates.
 - D. OLYMPIC No. 12-11 screws with 3¹/₄-inch-diameter plastic plates or nominally 3-inch-diameter galvanized steel plates, 0.018 inch minimum thickness.
- System No. 3. Fasteners for anchor sheet must be spaced along the lap a maximum of 8 inches on center, and two rows (staggered) 16 inches on center located 12 inches from each edge. Fasteners are OLYMPIC No. 12-11 screws with 3-inch-diameter galvanized steel plates, 0.018 inch minimum thickness.
- System No. 6. Fasteners for anchor sheet must be spaced a maximum of 8 inches on center, and two rows (staggered) 16 inches on center located 12 inches from each edge. Fasteners are Simplex Tube Lok with minimum 2.5-inch-diameter galvanized steel plates, minimum No. 30 MSG.
- System No. 7. Fasteners for anchor sheet are spaced a maximum of 8 inches on center, and two rows (staggered) 18 inches on center located 12 inches from each edge. Fasteners are ES Products FM-60 fasteners used with FM30 disc or Olympic C-R base ply fastener with minimum 2.5-inch-diameter galvanized steel plates, minimum No. 30 MSG.
- Systems 9, 10, 11, 12, 13, 14, 15, 16. Roof insulation is fastened with 1 fastener per 2 square feet. Fasteners are Dekfast, Roofgrip, Olympic, or Tru-Fast with metal plates only.
- Systems 17, 18, 19, 20, 21 and 22. Roof insulation is fastened with one fastener per 2 square feet. Fasteners are Dekfast 14, #15 Dekfast Heavy, Tapcon, Olympic No. 14, or Tru-Fast CF, metal plates only.

²Foam plastic insulation thickness is limited to the lesser of the maximum thickness specified in this table or the maximum thickness that limits the flame spread index to not more than 75 when tested in accordance with ASTM E 84.

³Abbreviations:

(MA) Mechanically attached

(HM) Hot mopped with hot roofing asphalt conforming to ASTM D 312, Type III or IV. Hot mopping is full coverage of hot roofing asphalt at the rate of 20 to 25 pounds per 100 square feet.

(SM) Spot mopped (System No. 8) with hot roofing asphalt conforming to ASTM D 312, Type III or IV. Spots are nominally 12 inches in diameter spaced nominally 24 inches in all directions.

⁴Roof insulations must comply with the applicable material standards

⁵System 23 – Base Sheet is mechanically attached with 1¹/₄-inch-long (32 mm) ring-shank nails with 1-inch-diameter (25.4 mm) metal cap nails spaced 8 inches (203 mm) on center in two evenly spaced staggered rows.