DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 21 00—Thermal Insulation
Section: 07 25 00—Water-Resistive Barriers/Weather Barriers
Section: 07 27 00—Air Barriers

REPORT HOLDER:

DUPONT DE NEMOURS, INC.

EVALUATION SUBJECT:

STYROFOAM™ BRAND INSULATION BOARDS AND DUPONT FAN-FOLD PRODUCTS

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- Other Codes (see Section 8.0)

Properties evaluated:

- Surface burning characteristics
- Attic installations
- Crawl space installations
- Air barrier
- Water-resistive barrier
- Thermal resistance
- Exterior walls in Types I-IV Construction
- Wind resistance (ANSI/FS 100)

1.2 Evaluation to the following green code(s) and/or standards:

- 2019 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2015 and 2012 International Green Construction Code® (IgCC)

Attributes verified:

See Section 2.0.

2.0 USES

Styrofoam™ brand insulation boards are extruded polystyrene foam plastic boards used as nonstructural thermal insulating material in buildings of Type I, II, III, IV and V construction under the IBC and dwellings under the IRC. The insulation is for use in wall assemblies, ceiling/floor assemblies, door cavities, roofs, foundations, attics and crawlspaces.

DuPont fan-fold products are extruded polystyrene foam plastic boards used as nonstructural thermal insulation in roofs, on foundations or on walls constructed in accordance with the IBC or IRC.

Styrofoam™ Duramate™ Plus, Styrofoam™ Residential Sheathing, Styrofoam™ Residing Board, Styrofoam™ Utilityfit, Styrofoam™ Scoreboard, Styrofoam™ Sheathing Material, Styrofoam™ Square Edge, Styrofoam™ Tongue and Groove, Styrofoam™ Cavitymate™ Ultra, Styrofoam™ Ultra SL, DuPont High Performance Underlayment, Bluecor™, and DuPont Protection Board III brand insulation boards may be used as alternatives to the water-resistive barriers specified in the IBC and IRC when installed in accordance with Section 4.3 and have been verified as conforming to the provisions of (i) CALGreen Section 5.407.1 for water-resistive barriers and Section A4.407.5 for air barriers; (ii) 2015 and 2012 IgCC Section 605.1.2.1 for air barriers; (iii) 2014 ASHRAE 189.1 Section 7.3.1.1 and 2011 ASHRAE 189.1 Section 7.4.2.9 for air barriers; (iv) ICC 700-2015 Section 602.1.8, 11.602.1.8 and 12.6.602.1.8; (v) ICC 700-2012 Section 602.1.8, 11.602.1.8 and 12.5.602.1.8; and (vi) ICC 700-2008 Section 602.9 for water-resistive barriers.

The attributes of the insulation have also been verified as conforming to the provisions of ICC 700-2008 Section 703.2.1.1.1(c) as an air impermeable insulation. Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance.

3.0 DESCRIPTION

3.1 Styrofoam™ Brand Insulation Boards:

Styrofoam™ brand insulation boards are extruded
polystyrene foam plastic complying with ASTM C578. The boards are available as various products having the product names and properties detailed in Table 1. The boards are available in various lengths and widths and in thicknesses up to 4 inches. The actual board thickness provided is determined based on the R-value stated for the product.

3.2 DuPont Fan-fold Products:
DuPont fan-fold products are extruded polystyrene foam plastic insulation provided in “fan-folded” bundles. The boards are available in various lengths and widths and in thicknesses up to 1/2 inch (12.7 mm). Table 2 details the physical properties of the fan-fold products. The actual board thickness provided is determined based on the R-value stated for the product.

3.3 Joint-sealing:
Weathermate™ Construction Tape is nominally 2 1/8 inches wide and is used in conjunction with Styrofoam™ brand insulation boards and DuPont fan-fold products to seal joints between two or more edges of the boards, when the insulation boards are installed as a water-resistant barrier. The installation must be as described in Section 4.4 of this report.

Weathermate™ Flashing Tape with a minimum 4-inch (102 mm) width, and Great Stuff™ Pro Gaps & Cracks sealant (ESR-1961), are used in conjunction with Styrofoam™ brand insulation boards to seal joints between two or more edges of boards, when insulation boards are installed as an air barrier assembly. The installation must be as described in Section 4.6.2 of this report.

LiquidArmor™ CM applied in a minimum 2-inch-wide (51 mm) band with a minimum 45 wet mils and Great Stuff™ Gaps & Cracks sealant (ESR-1961), are used in conjunction Styrofoam™ brand insulation boards to seal joints between two or more edges of the boards, when the insulation boards are used as a water-resistant barrier or an air barrier assembly. The installation must be as described in Section 4.4 or Section 4.6.2 of this report, respectively.

LiquidArmor™ LT applied in a minimum of 1-inch-wide (25.4 mm) band with a minimum 25 wet mils are used in conjunction Styrofoam™ brand insulation boards to seal joints between two or more edges of the boards, when the insulation boards are used as a water-resistant barrier or an air barrier assembly. The installation must be as described in Section 4.4 or Section 4.6.2 of this report, respectively.

LiquidArmor™ QS applied in a minimum of 2-inch-wide (51 mm) band with a minimum 45 wet mils are used in conjunction Styrofoam™ brand insulation boards to seal joints between two or more edges of the boards, when the insulation boards are used as a water-resistant barrier or an air barrier assembly. The installation must be as described in Section 4.4 or Section 4.6.2 of this report, respectively.

3.4 Surface Burning Characteristics:
Styrofoam™ brand insulation boards, insulation boards and DuPont fan-fold products have a flame-spread index (FSI) of 25 or less and a smoke-developed index (SDI) of 450 or less when tested in accordance with ASTM E84 (UL 723) at a maximum thickness of 4 inches (102 mm) and a maximum density of 4.0 pcf (64 kg/m³).

3.5 Thermal Resistance:
Styrofoam™ brand insulation boards and have a thermal resistance (R-value) as noted in Table 1. DuPont fan-fold products have a thermal resistance (R-value) as noted in Table 2.

3.6 Air Permeability
At a minimum thickness of 1/4 inch (6.4 mm), the Styrofoam™ brand insulation boards are considered air-impermeable in accordance with 2018 IBC Section 1202.3 (2015 IBC Section 1203.3) and 2018, 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4), based on testing in accordance with ASTM E283.

4.0 INSTALLATION

4.1 General
Styrofoam™ brand insulation boards and DuPont fan-fold products must be installed in accordance with the manufacturer’s published installation instructions and this report. For the purposes of this report, the term “insulation board” is intended to refer to both Styrofoam™ brand insulation boards and DuPont fan-fold products.

The installation of the insulation boards in areas of “very heavy” termite infestation probability must comply with 2018 and 2015 IBC Section 2603.8 [2012 IBC Section 2603.9 (2009 IBC Section 2603.8)] or IRC Section R318.4. Under the IBC, protection against condensation must be provided in accordance with 2018 IBC Section 1402.2 (2015, 2012 and 2009 IBC Section 1403.2); under the IRC, a vapor retarder must be provided in accordance with 2018, 2015 and 2012 IRC Section R702.7 (2009 IRC Section R601.3).

Insulation boards must not be used as a nailing base for finish materials or wall covering materials. Fasteners used to attach exterior finish material over insulation boards must comply with a current ICC-ES evaluation report for proprietary wall covering materials, 2018 IBC Section 1403 or 1402.4 (2015, 2012 or 2009 IBC Section 1404 or 1405), 2018 and 2015 IRC Table R703.3(1) (2012 and 2009 IRC Table R703.4), and the installation instructions from the finish manufacturer. For cementitious exterior wall coating applications, fasteners for insulation board thicker than 1 1/2 inches (38 mm) must be considered for lateral resistance to ensure support for the exterior wall coatings.

When the insulation boards are applied over open framing, vertical butt joints must be over framing members. Vertical tongue-and-groove or shiplap joints need not be over framing members, provided joints are staggered a minimum of one stud space from adjacent courses. For cementitious exterior wall coating systems, unbacked joints are permitted only when specified in the ICC-ES evaluation report on the cementitious exterior wall coating system.

When installation is in an attic or crawl space, that attic or crawl space area must be separated from the interior of the building by an approved 15-minute thermal barrier.

The foam must be installed as described in Section 4.3. Styrofoam™ brand insulation boards may be installed in unvented attics when the maximum thickness of the insulation boards does not exceed 1/4 inch (6.35 mm) in accordance with 2018, 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4) or 2018 IBC Section 1202.3 (2015 IBC Section 1203.3), as applicable.

4.2 Thermal Barrier Requirements:

4.2.1 Application with a Prescriptive Thermal Barrier:
As excepted as described in Section 4.2.2, Styrofoam™ brand insulation boards and DuPont fan-fold products must be separated from the interior of the building by an approved 15-minute thermal barrier as required in IBC Section 2603.4, or IRC Section R316.4.
4.2.2 Application without a Prescriptive Thermal Barrier: ASTM C578 Type X and Type IV Styrofoam™ Brand insulation boards may be installed without a prescriptive 15-minute thermal barrier required by the applicable code when the maximum thickness does not exceed 2 inches (51 mm). ASTM C578 Type VI and VII Styrofoam™ brand insulation boards must be installed with code-prescribed thermal barrier. See Section 4.3 for conditions related to the use of insulation in attics and crawl spaces.

4.3 Attics and Crawl Spaces – Ignition Barrier Requirements:

4.3.1 Application with a Prescriptive Ignition Barrier: Except as described in Section 4.3.2, when Styrofoam™ brand insulation boards are installed within attics or crawl spaces, where entry is made only for service of utilities, an ignition barrier must be installed in accordance with IBC Section 2603.4.1.6 or IRC Section R316.5.3 or R316.5.4, as applicable. The ignition barrier must be consistent with the requirements for the type of construction required by the applicable code and must be installed in a manner so that the foam plastic insulation is not exposed.

4.3.2 Installation without a Prescriptive Ignition Barrier: Where ASTM C578 Type X and ASTM C578 Type IV Styrofoam™ brand insulation boards, with the maximum nominal thickness of 2 inches (51 mm), are installed in an attic or crawl space the prescriptive ignition barrier required by IBC Section 2603.4.1.6 and IRC Sections R316.5.3 and R316.5.4 may be omitted where the following conditions apply:

1. Attic ventilation is provided when required by 2018 IBC Section 1202.3 (2015 IBC Section 1203.2) or IRC Section R806.8, as applicable; except unvented attic assemblies are permitted under the conditions prescribed in 2018, 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4).

2. Under-floor (crawl space) ventilation is provided when required by 2018 IBC Section 1202.4 [2015 IBC Section 1203.4 (2012 and 2009 IBC Section 1203.3)] or IRC Section R408.1, as applicable, except unvented crawl spaces are permitted under the conditions prescribed in IRC Section R408.3.

3. Combustion air is provided in accordance with IMC (International Mechanical Code®) Section 701

ASTM C578 Type VI and VII Styrofoam™ Brand insulation boards must be installed with code-prescribed ignition barrier.

4.3.3 Attics Only – Installation without a Prescriptive Ignition Barrier: ASTM C578 Type X and ASTM C578 Type IV Styrofoam™ brand insulation boards, with a maximum nominal thickness of 1 inch (25.4 mm), covered with a water-resistive barrier (Weathermate [ESR-2862], Weathermate Plus [ESR-3401] or Tyvek [ESR-2375]) exposed to the interior of the attic space, may be installed on the walls of an attic (including gable ends and knee walls) (the attic may contain utilities, including but not limited to, mechanical equipment; electrical wiring; fans; plumbing; gas or electric hot water heaters; gas or electric furnaces; etc.) with no coverings (no thermal or ignition barrier) applied, when all of the following conditions are met:

1. Entry to the attic is only to service utilities and no storage is permitted.

2. There are no interconnected attic areas.

3. Air in the attic is not circulated to other parts of the building.

4. Attic ventilation is provided when required by 2018 IBC Section 1202.3 (IBC Section 1203.2) or IRC Section R806, as applicable; except unvented attic assemblies are permitted under the conditions prescribed 2018, 2015 and 2012 IRC Section R806.5 (2009 IRC Section R806.4).

5. Combustion air is provided in accordance with IMC Section 701.

4.4 Water-resistive Barrier:

The noted Styrofoam™ brand insulation boards (Styrofoam™ Cavimyl™, Styrofoam™ Cavimyl™ Plus, Styrofoam™ Cavimyl™ SC, Styrofoam™ Cavimyl™ Ultra, Styrofoam™ Ultra SL, Styrofoam™ Duramyl™ Plus, Styrofoam™ Residential Sheathing, Styrofoam™ Residing Board, Styrofoam™ Utilifty, Styrofoam™ Scoreboard, Styrofoam™ Sheathing Material, Styrofoam™ Square Edge and Styrofoam™ Tongue and Groove) and DuPont fan-fold products (DuPont High Performance Underlayment, Bluecor™, and DuPont Protection Board III) may be used as alternate water-resistive barriers as prescribed in 2018 IBC Section 1403.2 (2015, 2012 and 2009 IBC Section 1404.2) or IRC Section R703.2, when installed on exterior walls as described in following sections:

4.4.1 Styrofoam™ brand insulation boards measuring 4 feet by 8 to 10 feet are installed horizontally or vertically with long joints in contact with one another. Boards measuring 2 feet by 8 feet are installed horizontally. When installed directly on framing members, framing members are spaced a maximum of 24 inches on center. The insulation boards are attached using 3/8-inch-head (9.5 mm) galvanized nails, 1-inch-crown (25.4 mm) galvanized staples or 1-inch-head (25.4 mm) plastic cap nails or equivalent fasteners long enough to penetrate framing a minimum of 3/4 inch. Nails or staples must not be over-driven. Fastener spacing for boards measuring 4 feet by 8 to 10 feet is a minimum of 12 inches on center around the perimeter and 16 inches on center in the field; for 2-foot-by-8-foot boards, fastener spacing is a minimum of 12 inches on center on each stud (three fasteners per stud). For window installation, the installation must be in accordance with the window manufacturer’s instructions. Minimum 3-inch-wide flashing is used to seal the sill of windows, and minimum 2-inch-wide flashing is used to seal jambs and heads. Fasteners for window installation must be sufficient length to achieve 1 1/4 inch (31.8 mm) embedment into framing. See also Figure 1.

DuPont fan-fold products must be installed over wood structural sheathing with long joints butted tightly together. The insulation foam board joints must be staggered relative to joints in the structural sheathing. The remainder of the installation is as described above for rigid boards.

For the Styrofoam™ brand insulation boards and DuPont fan-fold products mentioned in this section, seams and joints between boards must be covered by minimum 2/3-inch-wide (73 mm) Weathermate™ Construction Tape or equivalent. Penetrations in exterior walls must be sealed with Great Stuff™ Gaps & Cracks sealant (ESR-1961), or an equivalent expanding spray foam sealant, or an elastomeric sealant. See Figures 2 and 3.

4.4.2 Styrofoam™ brand insulation boards with a minimum thickness of 1 inch (25.4 mm) are installed horizontally or vertically with edge joints in contact with one another. The insulation boards must be installed directly on steel studs spaced a maximum of 16 inches (406 mm) on center. The insulation boards must be attached with screws with diameter of 2 inches (51 mm) plastic caps or washers, long enough to penetrate the framing a minimum of 0.45 inch.
(11.4 mm) and spaced a maximum of 16 inches (406 mm) on center in the field and 12 inches (305 mm) on center on the perimeter.

The horizontal and vertical seams and joints of the insulation boards must be covered with LiquidArmor™ CM applied in a minimum of 2-inch-wide (51 mm) band with a minimum 45 wet mils and Great Stuff™ Gaps & Cracks sealant (ESR-1961), LiquidArmor™ LT applied in a minimum of 1-inch-wide (25.4 mm) band with a minimum 25 wet mils or LiquidArmor™ QS applied in a minimum of 2-inch-wide (51 mm) band with a minimum 45 wet mils.

Flashing of penetration items must be in accordance with the manufacturer’s published installation instructions. Penetrations in exterior walls must be sealed with Great Stuff™ Gaps & Cracks sealant (ESR-1961), equivalent expanding foam sealant or an elastomeric sealant and covered with LiquidArmor™ CM, LiquidArmor™ LT or LiquidArmor™ QS. See Figures 4 through 6.

4.5 Use on Exterior Walls in Types I, II, III and IV Construction:

When used on exterior walls of Types I, II, III and IV construction, and when installed in accordance with this report, the assembly must comply with Section 2603.5 of the IBC and must be as described in Table 3; the insulation boards must be installed in a single layer of insulation board at a maximum thickness of 3 inches. Alternatively, the insulation boards may be used in Types I, II, III and IV construction when specifically named in another ICC-ES evaluation report, in which case the insulation boards must be installed as described in that report. The potential heat of the ASTM C578 Type X and ASTM C578 Type IV Styrofoam™ foam plastic insulation boards and is 2849 Btu/ft² per inch of thickness (30.0 MJ/m²).

4.6 Air Barrier:

4.6.1 Air Barrier Material: When used as an air barrier material, the insulation boards must be installed in accordance with The DuPont de Nemours, Inc.’s installation instructions and this report.

4.6.2 Air Barrier Assemblies:

4.6.2.1 When installed on exterior walls as described in this section, the ASTM C578 Type X and ASTM C578 Type IV Styrofoam™ foam plastic insulation is part of an air barrier assembly in accordance with 2018 and 2015 IECC Section C402.5.1.1 (2012 IECC Section C402.4.1.1). The assemblies qualify as a continuous air barrier as prescribed in 2018 and 2015 IECC Section C402.5.1 (2012 IECC Section C402.4.1). The styrofoam products listed in Section 1.0 of this report, subject to the following conditions:

5.0 CONDITIONS OF USE

The Styrofoam™ brand insulation boards and DuPont fan-fold products 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. The walls must be braced in accordance with Item 3 of 2018 and 2015 IECC Section C402.5.1.1 (2012 IECC Section C402.4.2). The assemblies qualify as a continuous air barrier as prescribed in 2018 and 2015 IECC Section C402.5.1 (2012 IECC Section C402.4.1).
interior of the building by an approved 15-minute thermal barrier, except as described in Section 4.2.

5.7 Where required by the applicable code, a vapor retarder system, which may include the foam plastic insulation, must be installed in the exterior wall, floor, and/or roof ceiling assembly.

5.8 Jobsite certification and labeling of the insulation must comply with 2018 and 2015 IRC Section N1101.10.1 [2012 IRC Section N1101.12 (2009 IRC Section N1101.4)] and 2018, 2015 and 2012 IECC Sections C303.1.1, R303.1.1 and R401.3 (2009 IECC Section 303.1 and 401.3), as applicable.

5.9 Use of insulation in areas where the probability of termite infestation is “very heavy” must be in accordance with 2018, 2015 and 2009 IBC Section 2603.8 (2012 IBC Section 2603.9) or IRC Section R318.4. When use is on exterior walls of buildings of Type I, II, III, or IV, construction must be as described in Section 4.4 and Table 3.

5.10 Styrofoam™ brand insulation boards and DuPont fan-fold products are manufactured in Burley, Idaho; Dalton, Georgia; Channahon, Illinois; Pevely, Missouri; Varennes, Quebec; and Wyoming, Michigan, under a quality-control program with inspections by ICC-ES.

5.11 Weathermate™ Flashing Tape has not been evaluated by ICC-ES for use as flashing under IBC Section 1405.4.

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2015 (editorially revised October 2017).

6.2 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Sheathing Panels Used as Water-resistant Barriers (AC71), dated February 2003 (editorially revised January 2018).

6.3 Report of room corner fire tests in accordance with NFPA 286.

6.4 Reports of room corner fire tests in accordance with NFPA 286, AC12 Appendix B, for attics and crawlspace in Section 4.2.

6.5 Reports of air leakage tests in accordance with ASTM E283 and ASTM E2357.

6.6 Reports of potential heat tests in accordance with NFPA 259.

6.7 Report of fire propagation tests in accordance with NFPA 285.

6.8 Data in accordance with ANSI/FS 100 for wind resistance.

7.0 IDENTIFICATION

7.1 The Styrofoam™ brand insulation boards, and fan-fold products described in this report are identified by a label on the board or packaging material bearing the DuPont de Nemours, Inc. name, product name, plant code or manufacturing address, other information to confirm code compliance, and the ICC-ES evaluation report number (ESR-2142); except for those products that are used in Types I, II, III, and IV construction, which must have the above-noted labeling printed on the board.

Weathermate™ Construction Tape, Weathermate™ Flashing Tape, LiquidArmor™ CM, LiquidArmor™ LT, and LiquidArmor™ QS are identified with the product names.

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

DUPONT DE NEMOURS, INC.
1501 LARKIN CENTER DRIVE
MIDLAND, MICHIGAN 48642
(866) 583-2583
www.dupont.com/building

8.0 OTHER CODES

In addition to the codes referenced in Section 1.0, the products described in this report were evaluated for compliance with the requirements of the following codes:

■ 2006 International Residential Code® (2006 IRC)

The products comply with the above-mentioned codes as described in Sections 2.0 through 7.0 of this report, with the revisions noted below:

■ General: See Section 4.1, except the approved thermal barrier must be installed in accordance with Section R314.4 or R314.5 of the 2006 IRC.

■ Protection against Termites: See Sections 4.1 and 5.9, except use of the insulation in areas where the probability of termite infestation is “very heavy” must be in accordance with Section 2603.8 of the 2006 IBC and Section R320.5 of the 2006 IRC.

■ Protection against Condensation: See Section 4.1, except a vapor barrier must be provided in accordance with Sections R318 and N1102.5 of the 2006 IRC.

■ Application without a Prescriptive Ignition Barrier: See Sections 4.2.2, except attics must be vented in accordance with 2006 IRC Section R806.4 and combustion air must be provided in accordance with 2006 IMC Sections 701 and 703. Additionally, the prescriptive ignition barrier required by Sections R314.5.3 and R314.5.4 of the 2006 IRC may be omitted.

■ Application without a Prescriptive Thermal Barrier: See Section 4.2. The prescriptive thermal barrier may be omitted based on testing in accordance with 2006 IBC Section 2603.9 and 2006 IRC Section R314.6.

■ Jobsite Certification and Labeling: See Section 5.8, except jobsite certification and labeling must comply with Section 102.1.2 of the 2006 IECC, when applicable.
## TABLE 1—STYROFOAM BRAND INSULATION BOARDS

<table>
<thead>
<tr>
<th>PRODUCT NAME</th>
<th>ASTM C578 TYPE</th>
<th>R-VALUE, R / INCH (unless otherwise noted) at 75°F (ft²·hr·°F/Btu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Styrofoam™ Ag Board</td>
<td>IV</td>
<td>5.0</td>
</tr>
<tr>
<td>Styrofoam™ Cavitymate™</td>
<td>X</td>
<td>5.0</td>
</tr>
<tr>
<td>Styrofoam™ Cavitymate™ Plus</td>
<td>IV</td>
<td>5.0</td>
</tr>
<tr>
<td>Styrofoam™ Cavitymate™ SC</td>
<td>X</td>
<td>5.0</td>
</tr>
</tbody>
</table>
| Styrofoam™ Cavitymate™ Ultra  | IV              | 10.0 at nominal 1 3/4"  
12.0 at nominal 2 1/8"  
14.0 at nominal 2 3/8"  
16.8 at nominal 3"  
19.6 at nominal 3 1/8" |
| Styrofoam™ Deckmate™ Plus     | IV              | 5.0                                                                 |
| Styrofoam™ Deckmate™ Plus FA  | IV              | 5.0                                                                 |
| Styrofoam™ Duramate™ Plus R2  | X               | 2.0 at nominal 1/8"                                                |
| Styrofoam™ Duramate™ Plus     | X               | 3.0 at nominal 1/2"                                                |
| Styrofoam™ Freezermate™       | IV              | 5.0                                                                 |
| Styrofoam™ Brand Freezermate™ | IV              | 5.0                                                                 |
| Styrofoam™ Brand Freezermate™ 30 | VI          | 5.0                                                                 |
| Styrofoam™ Brand Freezermate™ 40 | VI          | 5.0                                                                 |
| Styrofoam™ Brand Freezermate™ 60 | VII         | 5.0                                                                 |
| Styrofoam™ High Load 40       | VI              | 5.0                                                                 |
| Styrofoam™ High Load 60       | VII             | 5.0                                                                 |
| Styrofoam™ Lightguard Feedstock | VI          | 5.0                                                                 |
| Styrofoam™ Panel Core         | VI, VII         | 5.0                                                                 |
|                              | IV, X           | 5.0                                                                 |
| Styrofoam™ Panelmate™ Plus    | IV              | 5.0                                                                 |
| Styrofoam™ Perimate™          | IV              | 5.0                                                                 |
| Styrofoam™ Plazamate™         | VII             | 5.0                                                                 |
| Styrofoam™ Residential Sheathing R5 | X         | 5.0 at nominal 1"                                                   |
| Styrofoam™ Residential Sheathing R4 | X         | 4.0 at nominal 1/4"                                                 |
| Styrofoam™ Residential Sheathing R3 | X          | 3.0 at nominal 1/2"                                                 |
| Styrofoam™ Residing Board     | X               | 2.8 at nominal 1 1/2"                                              |
| Styrofoam™ Ribbed Roofmate™   | VI              | 5.0                                                                 |
| Styrofoam™ Roofmate™          | VI              | 5.0                                                                 |
| Styrofoam™ Scoreboard         | IV              | 5.0                                                                 |
| Styrofoam™ Sheathing Material | X, IV           | 5.0                                                                 |
| Styrofoam™ Square Edge        | IV              | 5.0                                                                 |
| Styrofoam™ Square Edge R3     | IV              | 3.0 at nominal 1/2"                                                 |
| Styrofoam™ Square Edge R4     | IV              | 4.0 at nominal 1/4"                                                 |
| Styrofoam™ Tongue and Groove  | IV              | 5.0                                                                 |
| Styrofoam™ Ultra SL           | IV              | 10.0 at nominal 1 3/4"  
12.0 at nominal 2 1/8"  
14.0 at nominal 2 3/8"  
16.8 at nominal 3"  
19.6 at nominal 3 1/8" |
| Styrofoam™ Utilityfit™        | X               | 5.0                                                                 |
| Styrofoam™ Wallmate™          | X               | 5.0                                                                 |

For SI: 1 inch = 25.4 mm, 1 pcf = 16.02 kg/m³, 1°F·ft²·hr/Btu = 0.176 m²·K/W, 1°F = 1.8°C+32.

1Type IV has a minimum density of 1.45 pcf, Type VI has a minimum density of 1.80 pcf.
2Type VII has a minimum density of 2.20 pcf, Type X has a minimum density of 1.30 pcf.

## TABLE 2—DUPONT FAN-FOLD PRODUCTS

<table>
<thead>
<tr>
<th>PRODUCT NAME</th>
<th>NOMINAL THICKNESS (inch)</th>
<th>THERMAL RESISTANCE (R-VALUE) at 75°F (ft²·hr·°F/Btu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DuPont High Performance Underlayment</td>
<td>1/4</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>3/8</td>
<td>1.5</td>
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<tr>
<td></td>
<td>1/2</td>
<td>2.0</td>
</tr>
<tr>
<td>Bluecor™</td>
<td>1/4</td>
<td>1.0</td>
</tr>
<tr>
<td>DuPont Protection Board III</td>
<td>1/4</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>3/8</td>
<td>1.5</td>
</tr>
<tr>
<td>Styrofoam™ Recovermate™ CR</td>
<td>3/8</td>
<td>1.5</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 pcf = 16.02 kg/m³, 1°F·ft²·hr/Btu = 0.176 m²·K/W, 1°F = 1.8°C+32.
### TABLE 3—NFPA 285 COMPLYING WALL ASSEMBLIES FOR MAXIMUM 3-INCH-THICK ASTM C578 TYPE IV STYROFOAM™ INSULATION BOARD

| Base Wall System – Use either 1, 2, or 3 | 1 – Concrete Wall  
| 2 – Concrete masonry wall  
| 3 – 1 layer of 1/2-inch or 3/4-inch Type X Gypsum Wall Board (on interior), installed over steel studs (minimum 3/4-inch deep, minimum No. 20-gage, maximum 16-inch o.c., lateral bracing every 4 ft. vertically) |
| Floorline Firestopping | 4 pcf mineral wool in each stud cavity and at each floorline. Mineral wool to be attached with Z-clips or equivalent (See Figure 7). |
| Cavity Insulation – Use either 1, 2, or 3 | 1 – None  
| 2 – Fiberglass batt insulation (faced or unfaced)  
| 3 – Any non-combustible material |
| Exterior Sheathing – Use either 1, 2 or 3 | 1 – None  
| 2 – 1/2-inch thick, exterior type gypsum sheathing  
| 3 – 3/4-inch thick, Type X, exterior-type gypsum sheathing |
| Weather-Resistive Barrier Applied to Exterior Sheathing – Use 1 or 2 | 1 – None  
| 2 – Any of the following:  
| a. Air Bloc 31MR² – Henry Co.  
| b. AIR-SHIELD™ LMP² (black only) – W.R. Meadows  
| c. Backstop® NT² – Dryvit  
| d. Barritech™ VP³ – Carlisle  
| e. CCW-705FR with CCW-702WB Primer² – Carlisle  
| f. Fire-Resist Barritech™ NP² – Carlisle  
| g. Green Guard® Max Building Wrap – Pactiv  
| h. Perm-A-Barrier™ Aluminum Wall Membrane with WB Primer² – Grace Construction Products  
| i. Perm-A-Barrier™ VPS² – Grace Construction Products  
| j. Tyvek® CommercialWrap® (ESR-2375)  
| k. Tyvek® Fluid Applied WB+™ – DuPont  
| l. Wall Guardian™ FW100A² – STS Inc.  
| m. WEATHERMATE™ (ESR-2862)  
| n. WEATHERMATE™ Plus (ESR-3401) |
| Note: All barriers to be installed at recommended application rates per manufacturer’s installation instructions. |
| Exterior Insulation | ASTM C578 Type IV Styrofoam™ insulation board: 1/2-inch (minimum) to 3-inch (maximum). Insulation board joints may be covered with 4-inch (maximum) wide asphalt or butyl-based flashing tape |
| Flashing | Flash all exterior insulation joints and veneer tie penetrations with one of the following:  
| 1 – LiquidArmor™ CM –Minimum 2-inch-wide with a minimum 45 wet mils  
| 2 – LiquidArmor™ LT – Minimum 1-inch-wide with a minimum 25 wet mils  
| 3 – LiquidArmor™ QS – Minimum 2-inch-wide with a minimum 45 wet mils |
| Weather-Resistive Barrier¹ Applied to Exterior Insulation – Use 1, 2, 3, 4 or 5 | 1 – None  
| 2 – Green Guard® Max Building Wrap – Pactiv  
| 3 – Tyvek® CommercialWrap® (ESR-2375)  
| 4 – WEATHERMATE™ (ESR-2862)  
| 5 – WEATHERMATE™ Plus (ESR-3401) |
| Exterior Veneer – Use 1, 2, 3, 4, 5 or 6 | 1 – Brick. Use standard nominal 4-inch thick, clay brick. Use standard brick veneer anchors installed vertically on each stud at a maximum of 24-inch o.c. creating a 2-inch maximum air gap between the exterior insulation and brick.  
| 2 – Concrete – Minimum 2-inch thick, with a 2-inch maximum air gap between exterior insulation and concrete.  
| 3 – Concrete masonry units - minimum 4-inch thick, with a 2-inch maximum air gap between exterior insulation and concrete masonry units.  
| 3 – Limestone – minimum 2-inch thick installed using any standard non-open-joint installation technique such as ship-lap.  
| 4 - Natural stone veneer – minimum 2-inch thick installed using any standard non-open-joint installation technique such as ship-lap.  
| 5 – Pre-cast artificial stone complying with ICC-ES AC51 – minimum 1/2-inch thick installed using any standard non-open-joint installation technique such as ship-lap.  
| 6 – Terracotta cladding – minimum 1/2-inch thick installed using any standard non-open-joint installation technique such as ship-lap. |
| Special Conditions | Use header treatment shown in Figures 5, 6 and 7 for all window and door openings in wall |

¹ A code-complying water-resistive barrier must be provided, either over the sheathing or over the exterior insulation.  
² This material was evaluated by ICC-ES to comply with Section 2603.5 of the IBC, when used as part of the wall assemblies outlined in Table 3, but has not been evaluated for use as a water-resistive barrier under Section 1404.2 of the IBC and Section R703.2 of the IRC.
FIGURE 1—TYPICAL WINDOW FLASHING DETAIL

FIGURE 2—TYPICAL PENETRATION FLASHING DETAIL – FLANGED

FIGURE 3—TYPICAL FLASHING DETAIL – UNFLANGED
FIGURE 4—TYPICAL WINDOW FLASHING DETAIL

FIGURE 5—TYPICAL PENETRATION FLASHING DETAIL—FLANGED

FIGURE 6—TYPICAL FLASHING DETAIL—UNFLANGED