



EVALUATION SUBJECT: QUADFOAM® 500

REPORT HOLDER:
Accella Polyurethane Systems
100 Enterprise Drive
Cartersville, GA 30120
(770) 607-0755

CSI Division: 07 00 00 – THERMAL AND
MOISTURE PROTECTION
CSI Section: 07 21 00 – Thermal Insulation

Shelf life is six months from date of manufacture when stored in original unopened containers at 50 to 85°F (10 to 29°C).

3.2 Surface Burning Characteristics

3.2.1 The QuadFoam® 500 insulation, at a maximum thickness of 4 inches (102 mm) and a nominal density of 0.5 pounds per cubic foot (8.0 kg/m³), has a flame spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84.

3.2.2 Thicknesses of up to 11½ inches (292 mm) for ceiling cavities and 7½ inches (191 mm) for wall cavities are recognized based on testing in accordance with NFPA 286, when covered with a minimum ½ inch (12.7 mm) thick gypsum board or an equivalent thermal barrier complying with, and installed in accordance with the IBC or IRC.

3.3 Thermal Resistance

QuadFoam® 500 insulation has a thermal resistance, R-value, at a mean temperature of 75° F (24° C) as shown in Table 1 of this report.

3.4 Intumescent Coatings

DC 315: Intumescent coating is manufactured by International Fireproof Technology Inc., and is a water-based coating supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums. The coating material has a maximum shelf life of 12 months when stored in factory-sealed containers at temperatures between 50°F (10°C) and 90°F (32°C).

1.0 SCOPE OF EVALUATION

1.1 Compliance to the following codes & regulations:

- 2015, 2012, 2009 and 2006 International Building Code® (IBC)
- 2015, 2012, 2009 and 2006 International Residential Code® (IRC)
- 2015, 2012, 2009 and 2006 International Energy Conservation Code® (IECC)

1.2 Evaluated in accordance with:

- ICC-ES AC 377, Approved April 2016

1.3 Properties assessed:

- Surface-burning characteristics
- Physical properties
- Thermal Resistance
- Use in attics and crawl spaces
- Air permeability
- Exterior Walls in Types I through IV Construction

2.0 PRODUCT USE

QuadFoam® 500 spray foam is used as a nonstructural thermal insulating material in Type V-B construction under the IBC and dwellings under the IRC. The insulation may also be used in construction Types I, II, III or IV when installed in accordance with Section 4.5 of this report. The insulation complies with IBC Section 2603, 2015, 2012 and 2009 IRC Section R316 (2006 IRC Section 314), and IECC Sections C303, C402, R303 and R402 (2009 IECC Sections 303 and 402; 2006 IECC Section 402).

3.0 PRODUCT DESCRIPTION

3.1 Product information: QuadFoam® 500 is a two-component, spray applied, open cell polyurethane foam plastic insulation having a nominal density of 0.5 pcf (8 kg/m³).

4.0 DESIGN AND INSTALLATION

4.1 General: QuadFoam® 500 spray-applied foam insulation shall be installed in accordance with the manufacturer's published installation instructions and this report. Where conflicts occur, the more restrictive governs. A copy of these instructions and this evaluation report shall be available on the jobsite at all times during installation.

4.2 Application: QuadFoam® 500 shall be applied using spray equipment specified by Accella Polyurethane Systems.

4.3 Thermal Barrier: QuadFoam® 500 spray foam insulation with maximum nominal thicknesses of 11.5 inches (292 mm) in ceiling cavities and 7.5 inches (190 mm) in wall cavities shall be separated from the interior of the building by a thermal barrier. The IBC and IRC specify an approved thermal barrier of ½-inch thick (12.7 mm) gypsum board wallboard or equivalent 15-minute thermal barrier complying with IBC Section 2603.4 or 2015, 2012 and 2009





IRC Section R316.4 (2006 IRC Section 314.4), as applicable and installed in accordance with the applicable code.

4.4 Attics and Crawl Spaces: When installing QuadFoam® 500 in attics and/or crawl spaces and a thermal barrier is omitted in accordance with IBC Section 2603.4.1.6 or 2015, 2012 and 2009 IRC Sections R316.5.3 or R316.5.4 (2006 IRC Sections R314.5.3 or R314.5.4), installation shall comply with either Sections 4.4.1 or 4.4.2 of this report.

QuadFoam® 500 spray-foam insulation qualifies as an air-impermeable insulation at a minimum thickness of 3.5 inches (89 mm) and, when installed in accordance with Sections 4.4.1 or 4.4.2.1 of this report, may be used to insulate unvented attics in accordance with IRC Section R806.4.

4.4.1 Application with a Prescriptive Ignition Barrier: When QuadFoam® 500 insulation is installed within attics and crawl spaces where entry is made only for service of utilities, an ignition barrier shall be installed in accordance with IBC Section 2603.4.1.6 or 2015, 2012 and 2009 IRC Sections R316.5.3 and R316.5.4 (2006 IRC Section R314.5.3 and R314.5.4), as applicable. The ignition barrier shall be consistent with the construction type of the building.

4.4.2 Application without a Prescriptive Ignition Barrier: Where the spray-applied insulation is installed in accordance with Section 4.4.2.1 or 4.4.2.2 of this report, the following conditions apply:

- a) Entry to the attic or crawl space is only to service utilities, and no storage is permitted.
- b) There are no interconnected attic or crawl space areas.
- c) Air in the attic or crawl space is not circulated to other parts of the building.
- d) Attic ventilation is provided when required by IBC Section 1203.2 or IRC Section R806, except when an air-impermeable insulation is permitted in unvented attics in accordance with Section R806.4 of IRC. Under-floor (crawl space) ventilation is provided when required by 2015 IBC Section 1203.4 (2012, 2009 and 2006 IBC Section 1203.3) or IRC Section R408.1, as applicable.
- e) The foam plastic insulation is limited to the maximum thickness and density tested.
- f) Combustion air is provided in accordance with Sections 701 of the International Mechanical Code® (IMC) (2006 IMC Sections 701 and 703).
- g) The installed coverage rate or thickness of coatings, if part of the insulation system, shall be equal to or greater than that which was tested.

4.4.2.1 Attics and Crawl Spaces: QuadFoam® 500 spray foam insulation is permitted to be spray-applied without a prescriptive ignition barrier to the underside of the roof deck to thicknesses not exceeding 11.5 inches (292 mm) and/or vertical surfaces to thicknesses not exceeding 7.5 inches

(190 mm), as described in this section. The foam plastic shall be covered on all exposed surfaces with an application of DC 315 intumescent coating as described in Section 3.4 of 4 mils wet film thickness and 3 mils dry film thickness. Surfaces to be coated shall be dry, clean, and free of dirt, loose debris and other substances. The coating shall be applied in one-coat with low-pressure airless air equipment.

4.4.2.2 Use on Attic Floors: QuadFoam® 500 insulation may be installed exposed (no coating), without an ignition barrier up to a maximum thickness of 11½ inches (292 mm) between and over the joist in attic floors. The insulation shall be separated from the interior of the building by an approved thermal barrier complying with Section 4.3 of this report. The ignition barrier required by IBC Section 2603.4 and 2015, 2012 and 2009 IRC Section R316.5.3 (2006 IRC Section 314.5.3) may be omitted in this case.

4.5 Exterior Walls of Types I, II, III or IV Construction (IBC)

4.5.1 General: When QuadFoam® 500 insulation is used in exterior walls of Types I, II, III or IV construction of any height, the insulation shall comply with IBC Section 2603.5 and this section.

4.5.2 Complying Exterior Wall Assemblies: Wall assemblies that comply with Section 2603.5 of the IBC and this report that may be used in exterior walls of buildings of Type I, II, III or IV construction of any height are described in Tables 2 of this report.

5.0 LIMITATIONS

The QuadFoam® 500 spray foam insulation described in this report complies with, or is a suitable alternative to what is specified in those codes listed in Section 1.0 of this report, subject to the following limitations:

5.1 The product shall be installed in accordance with the manufacturer's published installation instructions, this evaluation report and the applicable code. The more restrictive governs if there are any conflicts between the manufacturer's published installation instructions and this report.

5.2 QuadFoam® 500 insulation shall be protected by a 15-minute thermal barrier in accordance with Section 2603.4 of the IBC; except installation in attics and crawl spaces may be protected by an ignition barrier in accordance with Section 2603.4.1.6 of the IBC.

5.3 The A and B components of the insulation are produced under a quality control program with inspections by IAPMO Uniform ES.

5.4 QuadFoam® 500 insulation shall be installed by contractors certified by Accella Polyurethane Systems.



5.5 When QuadFoam® 500 insulation is used in areas wherein the likelihood of termite infestation is “very heavy,” it shall be installed in accordance with 2015, 2012 and 2009 IBC Section 2603.8 (2012 IBC Section 2603.9) or IRC Section R318.4 (2006 IRC Section R320.5), as applicable.

5.6 Jobsite labeling and certification of the insulation shall comply with 2015 IRC Sections N1101.10 and N1101.10.1.1, 2012 IRC Sections N1101.12 and N1101.12.1, 2009 and 2006 IRC Sections N1101.4 and N1101.4.1 and IECC Sections C303.1.1 and C303.1.2 (2009 IECC Section 303.1.1.1; 2006 IECC Sections 102.1.1 and 102.1.1.1) as applicable.

5.7 Where applicable, QuadFoam® 500 shall be installed with a vapor retarder in accordance with the applicable code.

5.8 Use of QuadFoam® 500 insulation under this report is limited to Construction Type VB.

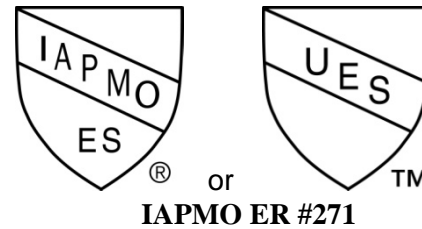
6.0 EVIDENCE SUBMITTED

6.1 Data and test reports submitted are from laboratories in compliance with ISO/IEC 17025 and in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation, (AC377), Approved April 2016, including reports of tests in accordance with Appendix X of AC 377.

6.2 Reports on fire propagation characteristics tests in accordance with NFPA 285.

7.0 IDENTIFICATION

Containers of QuadFoam® 500 components are identified with a label bearing the Accella Polyurethane Systems. name address; the product trade name (QuadFoam® 500, Grade S, W, AS or AW); the lot number; the flame spread and smoke developed indices; mixing instructions; density; the shelf life; the expiration date; and the IAPMO Uniform ES Evaluation Report number (ER-271).



Brian Gerber

Brian Gerber, P.E., S.E.
Vice President, Technical Operations
Uniform Evaluation Service

Richard Beck

Richard Beck, PE, CBO, MCP
Vice President, Uniform Evaluation Service

Russ Chaney

GP Russ Chaney
CEO, The IAPMO Group

For additional information about this evaluation report please visit www.uniform-es.org or email at info@uniform-es.org

Table 1—Thermal Resistance (R-Values)¹

SI: 1 inch = 25.4 mm; 1 °F•ft²•hr/Btu = 0.176

Thickness (inch)	R-Value (°F•ft ² •hr/Btu)
1.0	3.6
2.0	7.1
3.0	11
4.0	14
7.5	26
11.5	40

°K•m²•hr/W

¹R-values are calculated based on tested k-factors at 1- and 4-inch thicknesses.



**TABLE 2 - NFPA 285 COMPLYING EXTERIOR WALL ASSEMBLIES
FOAMSULATE 220² APPLIED TO EXTERIOR OF WALL ASSEMBLY WITH FOAMSULATE 220² OR
QUADFOAM[®] 500 IN WALL STUD CAVITY**

WALL COMPONENT	MATERIAL DESCRIPTION
Base Wall System (BWS) Use either 1, 2 or 3	1 – concrete wall 2 – concrete masonry wall 3 – 1 layer of 5/8-inch thick Type X gypsum wallboard installed on the interior side of minimum 35/8-inch deep minimum No. 25 gauge steel studs spaced a maximum of 24 inches on center. Lateral bracing installed minimum every 4 feet vertically or as required. Wall stud cavities shall be filled at each floor line with minimum 4 pcf density mineral wool (e.g. Thermafiber) friction fit between steel wall studs.
Perimeter Fire Barrier System	Perimeter fire barrier system complying with Section 715.4 of the 2015 or 2012 IBC shall be installed, as applicable, to fill the void created at the intersection of the exterior curtain wall assembly and the concrete floor slab.
Interior Insulation Use either 1, 2, 3, 4 or 5; or combination of 3 and 4; or combination of 3 and 5	1 – None 2 – Maximum 35/8-inch thickness of QuadFoam [®] 500 open-cell SPF insulation applied to the interior surface of BWS 1 or 2 above. ^{1,3,4} 3 – QuadFoam [®] 500 insulation applied to the full depth of the wall stud cavity, or less, with exterior gypsum sheathing (see BWS 3 above) as the substrate covering the width of the cavity and the inside of the steel wall stud framing flange. ^{3,4} 4 – Fiberglass batt insulation (faced or unfaced) 5 – Mineral wool insulation (faced or unfaced)
Exterior Sheathing Use either 1 or 2	1 – None (for BWS 1 or 2 above) 2 – 5/8-inch thick exterior gypsum sheathing (for BWS 3 above)
Exterior Insulation	Maximum 4-inch thickness of Foamsulate 220 ² insulation
Exterior Wall Covering² Use either 1, 2, 3, 4 or 5	1 – Brick: Standard type brick veneer anchors, installed at a minimum 24-inches on center, vertically on each stud with maximum 1-inch air gap between exterior insulation and brick. Brick to be standard nominal 4-inch thick clay brick installed in a running bond pattern using Type S mortar. 2 – Stucco: Minimum 3/4-inch thick, exterior cement plaster and lath. A secondary water-resistive barrier (WRB) may be installed between the exterior insulation and the lath. The secondary WRB shall not be full-coverage asphalt or butyl-based self-adhered membranes. 3 – Natural Stone: Minimum 2-inch thick natural stone (granite, limestone, marble, sandstone). Any standard non-open jointed installation technique may be used. 4 – CMU and others: Minimum 1½-inch thick concrete masonry unit (CMU), pre-cast concrete or artificial cast stone. Any standard non-open jointed installation method may be used. 5 – Terra Cotta: Minimum 1¼-inch thick Terra Cotta non-open jointed. Any standard non-open jointed installation method may be used.
Flashing of window, door and other exterior wall penetrations	As an option, flash around windows, doors and other exterior penetrations with limited amounts of maximum 12-inch wide flashing tape (acrylic, asphalt or butyl-based) or liquid-applied membrane material with or without fiber mesh reinforcements.

SI: 1 inch = 25.4 mm; 1 pcf = 16.0 kg/m³; 1 Btu/ft² = 0.01128 MJ/m²

¹ Fireblocking per Section 718 of the 2015 or 2012 IBC and thermal barrier material requirements per Section 2603.4 of the 2015 or 2012 IBC shall be met for Base Wall Systems 1 and 2, as required by specific wall construction details when a combustible concealed space is created on interior side of exterior wall assembly.

² Foamsulate 220 in accordance with IAPMO UES ER-352.