

## Description

**BioBased 1701s®** is a water blown, two-part, closed cell, bio-based spray applied, polyurethane foam having a nominal density of 1.7 p.c.f. (27.3 kg/m<sup>3</sup>).

When spray applied, **BioBased 1701s®** expands 30:1, filling voids, crevices and building cavities, and can reduce energy consumption needed for climate control by reducing infiltration. Once installed, **BioBased 1701s®** assists in increasing thermal resistance, and can assist in reducing the risk of moisture accumulation within the building envelope.

## Installation

**BioBased 1701s®** must be installed by certified dealers who have successfully completed a BioBased Insulation® approved training program or BioBased Insulation® approved field certification training which covers proper application techniques, environmental health and safety, building science and building code standards.

Always consult with local building code inspectors prior to installing **BioBased 1701s®**.

## Evaluation Criteria

For proper use of this material, refer to the *BioBased Insulation® Certified Dealer Training Manual* and the following building codes and guides:

**2006 International Building Code® (IBC) – Chapter 26**

**2006 International Residential Code® (IRC) Section R314**

**API publication Ax-230:** Fire & Safety Guidelines for Use of Rigid Polyurethane and Polyisocyanurate Foam Insulation in Building Construction.

## Architectural Reference

**Division: 07**—Thermal and Moisture Protection

**Section: 07210**—Building Insulation

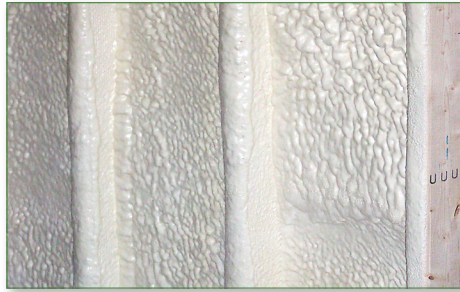
Model architectural specifications in CSI three-part format are available upon request.

## Recommended Uses

**BioBased 1701s®** can be used in residential, commercial and industrial applications. The following design assemblies are a general design guide only. **BioBased 1701s®** may be useful in other applications. Always consult with the local authority having jurisdiction before use.

## General:

**BioBased 1701s®** must be separated from



the occupants by an approved thermal barrier of ½" thick (12.7 mm) gypsum wall-board or an equivalent 15-minute thermal barrier complying with, and installed in accordance with, IBC Section 2603.4, IRC Section 314.4 or UBC Section 2602.4, as applicable, except when installed in attics and crawl spaces. Maximum thickness of the insulation is 6.5" (165 mm) in the walls and 9.5" (241 mm) in the ceiling.

## Conditioned Attic Assembly:

**BioBased 1701s®** may be installed in attics and covered with Flame Control Foam Kote 50-50 ignition barrier on the interior side of the insulation provided all of the following conditions are met:

- √ Entry to the attic is only to service utilities and no open combustion appliances are permitted.
  - Open-combustion appliances may be separated from the attic by enclosing the equipment in a mechanical closet constructed of ½" (12.7 mm) gypsum or equivalent 15-minute thermal barrier with combustion air supplied in accordance with the International Mechanical Code.
- √ There are no interconnected basement or attic areas.
- √ Ventilation of the attic or crawlspace is provided in accordance with the applicable code.
- √ The insulation is applied at a maximum thickness of 6" (152 mm) on the walls and a maximum thickness of 10" (254 mm) on the underside of the structural roof sheathing.
- √ The attic floor/ceiling is not insulated.
- √ Bathroom exhaust ventilation ducts extend to the exterior of the envelope.
- √ Flame Control Foam Kote 50-50 is applied to the interior surface of the insulation at a coverage rate of 100 ft<sup>2</sup>/per gallon (2.45 m<sup>2</sup>/L) in two coats.

## Vented Attic Assembly (use on attic floors):

**BioBased 1701s®** may be installed exposed at a maximum thickness of 9.5" (241 mm) between joists in attic floors/ceilings. The insulation must be separated from the interior of the building by an approved thermal barrier. The ignition barrier in accordance with IBC Section 2603.4.1.6 and IRC Section R 314.2.3 may be omitted.

## Conditioned Crawlspace Assembly:

**BioBased 1701s®** may be installed on the crawlspace walls and coated with Flame Control Foam Kote 50-50 ignition barrier provided that all of the following conditions are met:

- √ Entry to the crawlspace is only to service utilities and no open combustion appliances are permitted.
  - Open-combustion appliances may be separated from the crawlspace by enclosing the equipment in a mechanical closet constructed of ½" (12.7 mm) gypsum or equivalent 15-minute thermal barrier with combustion air supplied in accordance with the International Mechanical Code.
- √ One of the following methods of ventilation is provided.
  - Continuously operated mechanical exhaust ventilation at a rate equal to 1 cfm (0.47 L/s) for each 50 ft<sup>2</sup> (4.7m<sup>2</sup>) of crawlspace floor area, including an air pathway to the common area (such as a duct or transfer grille).
  - Conditioned air supply sized to deliver at a rate equal to 1 cfm (0.47 L/s) for each 50 ft<sup>2</sup> (4.7m<sup>2</sup>) of crawlspace floor area, including a return air pathway to the common area.
- √ The insulation is applied at a maximum thickness of 6" (152 mm) on the crawlspace walls.
- √ The exposed earth is covered with a continuous vapor barrier. Joints of the vapor barrier shall be overlapped by a minimum of 6" (152 mm) and be taped or sealed. The edges of the vapor barrier shall extend up the stem wall a minimum of 6" (152 mm).
- √ The insulation is not installed within 6" (152 mm) of the ground.
- √ The insulation fills and seals the rim/band joist area.
- √ No insulation is applied to the crawlspace ceiling.
- √ Flame Control Foam Kote 50-50 is applied to the interior surface of **BioBased 1701s®** at a coverage rate of 100 ft<sup>2</sup>/gal. (2.45m<sup>2</sup>/L) in two coats.

## Vented Crawlspace Assembly:

**BioBased 1701s®** may be installed in crawlspace ceilings and coated with Flame Control Foam Kote 50-50 ignition barrier provided that all of the following conditions are met:

- √ Entry to the crawlspace is only to service utilities, and no open combustion appliances are permitted.
  - Open-combustion appliances may be separated from the crawlspace by enclosing in a mechanical closet of ½" (12.7 mm) gyp with combustion air supplied in accordance with the International Mechanical Code.
- √ Ventilation openings are located in the foundation walls with a net free opening area of not less than 1 ft<sup>2</sup> (305 mm<sup>2</sup>) per 150 ft<sup>2</sup> (45.7 m<sup>2</sup>) of under-floor area.
- √ One ventilation opening is provided within 3' (1m) of each corner.

- ✓ The insulation is applied in direct contact with the underside of the sub floor at a maximum thickness of 9" (229 mm).
- ✓ No insulation is applied to the crawlspace walls.
- ✓ Flame Control Foam Kote 50-50 is applied to the interior surface of **BioBased 1701s®** at a coverage rate of 100 ft<sup>2</sup>/gal. (2.45 m<sup>2</sup>/L) in two coats.

**Application Below Grade:**

**BioBased 1701s®** may be installed on the exterior of foundation walls. For application guidance follow SPFA AY-140 "Spray Polyurethane Foam for Exterior Subgrade Thermal and Moisture Protection" and local building code.

**Safety and Handling**

Refer to Material Safety Data Sheet (MSDS) prior to application of **BioBased 1701s®**.

Storage temperatures for both 'A' and 'B' components should be between 60°F (15.6° C) and 90°F (32.2°C) out of direct sunlight. Conditioned trailers or storage areas may be necessary.

Use adequate ventilation to keep airborne particulates below the exposure level. Wear respiratory protection if material is heated, sprayed, or if the exposure limit is exceeded. Empty drums should be dry, punctured

with a non-sparking tool and sent to a qualified drum recycler. Liquid product should be incinerated in a licensed facility in accordance with local, state, and federal regulations. Do not discharge to waterways or sewer systems or dispose of on the ground.

**In case of Chemical Emergencies:**  
Call CHEMTREC (800) 424-9300 or (Collect) (703) 527-3887 (USA)

**Application Guidelines\***

While prepping equipment, heating drums and re-circulating for spray foam application, agitate the 'B' component mildly for 15 to 30 minutes before application using a pneumatic or equivalent performing mixer. Agitate for approximately 1 to 2 hours for a maximum of 4 hours each day during application to prevent frothing.

Depth per pass should be between ½" (12.7mm) and 1½" (38mm). Thin passes (¼" [6.35mm] or less) should be avoided and may result in reduced yield. Exceeding an overall depth of 4" (102mm) in 24 hours can cause internal charring of the foam and spontaneous combustion. Do not exceed 4" (102mm) in 24 hours at any depth per pass.

Allow a 5 to 10 second time interval between passes to allow foam to cure and

reduce the likelihood of blowing the uncured foam away from the substrate.

*\*It is important that applicators review and understand the BioBased Insulation® Certified Dealer Training Manual prior to use or application of BioBased 1701s®. Failure to follow the manufacturer's recommended guidelines may cause the warranty to become null and void.*

**Flushing/Purging**

**Chemical blown foams followed by BioBased 1701s® water blown foam:**

When using **BioBased 1701s®** after a chemically blown spray polyurethane foam it is necessary to flush the entire system with a non-water based solvent in order to achieve maximum foam quality and yield.

**Water blown foams followed by BioBased 1701s®:**

Flushing the system with solvent may not be necessary when switching from one water blown foam system to the next, but it is imperative that any remaining product from the previous application is completely removed or flushed from applicator guns, lines and pumping system by a throughput of **BioBased 1701s®** product until test sprays indicate that no mixed foam is present in the system.

**Containers**

Shipping weight per set is 1,032 pounds (468 kg). A set **BioBased 1701s®** consists of one (1) 55 gallon (208 L) drum of 'A' component and one (1) 55 gallon (208 L) drum of 'B' component.

**Effect of Environment and Substrate Conditions on Application**

The system settings required to achieve quality foam application will vary depending on environmental and substrate conditions. The following recommend parameters will help ensure optimum foam quality. Always consult the *BioBased Insulation® Certified Dealer Training Manual* prior to installing any BioBased Insulation® product.

	A Component	B Component	Hose
Drum Temp.	Approx. 70°F (21°C)	Approx. 110°F (43°C)	
Proportioner Temp.	140°F to 145°F (60–63°C)	150°F to 155°F (66–68°C)	140°F to 145°F (60–63°C)
Pressure	1200 to 1600 psi (83–110 bar)		
Ambient Temp	50°F to 120°F (10–49°C)		
Relative Humidity	< 85%		
Substrate Moisture	Substrate must be dry < 12% WMC		
Wind	< 12 mph (19 km/h)		
Max Service Temp	< 180°F (82°C)		

**GREENGUARD Certification Program®**

BioBased 1701s® is a third-party certified product that meets the stringent level requirements of the GREENGUARD Certification Program®, and has passed the GREENGUARD Certification Program for Children & Schools.



view listing at [greenguard.org](http://greenguard.org)

	Indoor Air Quality Criteria	Product Measurement after 7 days	Product IAQ Compliance
TVOC	≤ 0.5 mg/m <sup>3</sup>	< 0.003 mg/m <sup>3</sup>	Yes
Formaldehyde	≤ 0.5 ppm	< 0.002 ppm	Yes
Total Aldehydes	≤ 0.1 ppm	0.002 ppm	Yes
Individual VOCs	All ≤ 1/10 TLV	None	Yes

\*GREENGUARD Children & Schools products have been tested for their chemical emissions performance according to California Specification 01350.

Properties	Value	Test Method
<b>Water Vapor Permeability†</b>		
1" (25 mm)	2.06 perms	ASTM E 96
2.5" (63.5 mm)	0.73 perms	ASTM E 96
<b>Water Absorption</b>	0.2%	ASTM D 2842
<b>Air Leakage<sup>Δ</sup></b>		
1" (25 mm) thick foam @ 75 PA	< 0.02 L/s/m <sup>2</sup>	ASTM E 283
<b>Closed Cell Content</b>	> 90%	ASTM D 2856
<b>Core Density (nominal)</b>	1.7 lbs./ft <sup>3</sup>	ASTM D 1622
<b>Compressive Strength</b>	23 p.s.i. (1.6 bar)	ASTM D 1623
<b>Tensile Strength</b>	19 p.s.i. (1.3 bar)	ASTM D 1621
<b>Fungi Resistance</b>	Pass	ASTM C 1338
<b>Dimensional Stability</b>		
180°F (82°C), Ambient Humidity	< 1%	ASTM D 2126
73°F (23°C), 50% Relative Humidity	< 1%	ASTM D 2126
-4°F (-20°C), Ambient Humidity	< 1%	ASTM D 2126
<b>Surface Burning Characteristics</b>	1.625" (41 mm)	ASTM E 84
<b>Flame Spread Index</b>	≤ 25	ASTM E 84
<b>Smoke Developed Index</b>	≤ 450	ASTM E 84
<b>Room Corner</b>	Pass	NFPA 286

Wall: 2"x6" (38 mm x 140 mm) studs 24" (610 mm) o.c., Full Fill Foam.  
 Ceiling: 2"x10" (38 mm x 241 mm) studs 24" (610 mm) o.c., Full Fill Foam.  
 Covered with 1/2" (12.7 mm) Gypsum.

<b>Alternate Ignition Barrier</b>	Pass	SWRI 99-02
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Wall: 2"x6" (38 mm x 140 mm) studs 24" (610 mm) o.c., 6" (152 mm) foam.  
 Ceiling: 2"x10" (38 mm x 241 mm) studs 24" (610 mm) o.c., 10" (254 mm) foam.  
 Covered with Flame Control Foam Kote 50-50 at 100 sq ft/gal in two coats.

Initial R-Value	°F·h·ft <sup>2</sup> /BTU	(K·m <sup>2</sup> /W)	
1" (25 mm) nominal thickness	R – 5.9	RSI – 1.04	ASTM C 518
2" (51 mm) nominal thickness	R – 12	RSI – 2.11	***
3" (76 mm) nominal thickness	R – 18	RSI – 3.17	***
3.5" (89 mm) nominal thickness	R – 19	RSI – 3.35	***
5" (127 mm) nominal thickness	R – 28	RSI – 4.93	***
7" (178 mm) nominal thickness	R – 39	RSI – 6.87	***
8" (203 mm) nominal thickness	R – 44	RSI – 7.75	***
9" (229 mm) nominal thickness	R – 50	RSI – 8.81	***

<sup>Δ</sup> The International Residential Code defines air impermeable as having less than 0.02 L/m-s at 75 Pa.  
<sup>\*</sup> This numerical flame spread and all other data presented is not intended to reflect the hazards presented by this or any other material under actual fire conditions.  
<sup>†</sup> ASHRAE defines a Class II vapor retarder as a material having between 0.1 and 1 perms.  
 \*\*\* Calculated based on the K-Value at 3.5".

**Read This Before You Buy - What You Should Know About R-Values**

The chart shows the R-value of this insulation. R means resistance to heat flow. The higher the R-value, the greater the insulating power. Compare insulation R-values before you buy. There are other factors to consider. The amount of insulation you need depends mainly on the climate you live in. Also, your fuel savings from insulation will depend upon the climate, the type and size of your house, the amount of insulation already in your house, and your fuel use patterns and family size. If you buy too much insulation, it will cost you more than what you'll save on fuel. To get the marked R-value, it is essential that this insulation be installed properly.

**Notice:** The technical data contained herein is true and accurate to the best knowledge and information available to BioBased Insulation® on the date of publication. The technical data is subject to change, however, and the user should contact BioBased Insulation® prior to use or application to verify that the technical data is current. In addition, the technical data is provided for your guidance only. Because many factors can affect the processing or application of the product and/or its use, it is the user's responsibility to first test the product to determine its suitability for the user's intended use. The sale and use of this product is subject to all of the terms and conditions set forth in the BioBased Insulation® sales order, including the LIMITED WARRANTY, DISCLAIMER OF WARRANTY AND RELEASE, and EXCLUSION OF CONSEQUENTIAL AND OTHER DAMAGES. This technical data does not create an express warranty of any kind. The only warranty applicable to this product is the written, limited express warranty contained in the BioBased Insulation® sales order, which is extended to the purchaser only.

