

### Description

**BioBased 501w®** is a water blown, two-part, open cell, bio-based spray applied, polyurethane foam having a nominal density of 0.5pcf (8 kg/m<sup>3</sup>).

When spray applied, **BioBased 501w®** expands 100:1, filling voids, crevices and building cavities, and reduces energy consumption needed for climate control by reducing infiltration. Once installed, **BioBased 501w®** assists in increasing thermal resistance, minimizes sound transfer, and can reduce the risk of moisture accumulation within the building envelope.

### Installation

**BioBased 501w®** 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 501w®**.

### Evaluation Criteria

**BioBased 501w®** meets or exceeds the evaluation criteria for ICC (International Code Council) approval as a building insulation. Its ICC-ES approval number is ESR-1383, and shall be installed in full compliance with the *BioBased Insulation® Certified Dealer Training Manual* and the following codes or guides:

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

**2006 International Residential Code® (IRC) – Section 314**

**API publication Ax-230:** Fire and 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 501w®** can be used in residential, commercial and industrial applications. The following design assemblies are a general design guide only. **BioBased 501w®** may be useful in other applications. Always consult with the local authority having jurisdiction before use.



#### General:

**BioBased 501w®** must be separated from the occupants by ½" (12.7mm) thick gypsum wallboard 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 crawlspaces. Maximum thickness of the insulation is 7" (192.5 mm) in the walls and 11.5" (292.1 mm) in the ceiling.

#### Conditioned Attic Assembly 1:

**BioBased 501w®** may be installed in attics without an ignition barrier covering on the interior side of the insulation provided that all of the following conditions are met:

- √ Entry to the attic is only to service utilities, and no heat-producing appliances are permitted.
  - Heat-producing appliances may be separated from the attic by a mechanical closet constructed of ½" (12.7 mm) gypsum or an approved 15-minute thermal barrier with combustion air supplied in accordance with the International Mechanical Code.
- √ There are no interconnected basement or attic areas.
- √ Air in the attic is not circulated to other parts of the building.
- √ Ventilation of the attic is provided in accordance with the applicable code.
- √ The insulation is applied at a maximum thickness of 6" (152.4 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.

#### Conditioned Attic Assembly 2:

**BioBased 501w®** 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 a mechanical closet constructed of ½" (12.7 mm) gypsum or an approved 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" (152.4 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>/gal (2.45 m<sup>2</sup>/L) in two coats.

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

**BioBased 501w®** may be installed exposed at a maximum thickness of 11.5" (292.1 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 1:

**BioBased 501w®** may be installed in crawlspace walls without a covering provided that all of the following conditions are met:

- √ Entry to the crawlspace is only to service utilities and no heat-producing appliances are permitted.
  - Heat-producing appliances may be separated from the attic by a mechanical closet constructed of ½" (12.7 mm) gypsum or an approved 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> (4.7 m<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> (4.7 m<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 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.

**Conditioned Crawlspace Assembly 2:**

**BioBased 501w®** may be installed in 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 a mechanical closet constructed of ½" (12.7 mm) gypsum or an approved 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 ft² (4.7 m²) 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 50ft² (4.7 m²) 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 over lapped 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 501w®** at a coverage rate of 100 ft² (2.54 m²/L) in two coats.

**Vented Crawlspace Assembly 1:**

**BioBased 501w®** may be installed in crawlspace walls without a covering provided that all of the following conditions are met:

- ✓ Entry to the crawlspace is only to service utilities, and no heat-producing appliances are permitted.
  - Heat-producing appliances may be separated from the crawlspace by a mechanical closet constructed of ½" (12.7 mm) gypsum or an approved 15-minute thermal barrier 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 ft² (0.093 m²) per 150 ft² (14 m²) of under-floor area.
- ✓ One ventilation opening is provided within 3ft (0.9 m) of each corner.
- ✓ The insulation is applied in direct contact with the underside of the sub floor at a maximum thickness of 10" (254 mm).
- ✓ No insulation is applied to the crawlspace walls.

**Vented Crawlspace Assembly 2:**

**BioBased 501w®** 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 a mechanical closet constructed of ½" (12.7 mm) gypsum or an approved 15-minute thermal barrier 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 ft² (0.09 m²) per 150 ft² (14 m²) of under-floor area.
- ✓ One ventilation opening is provided within 3' (0.9 m) of each corner.
- ✓ The insulation is applied in direct contact with the underside of the sub floor at a maximum thickness of 10" (254mm).
- ✓ No insulation is applied to the crawlspace walls.
- ✓ Flame Control Foam Kote 50-50 is applied to the interior surface of **BioBased 501w®** at a coverage rate of 100 ft²/gal (2.45 m²/L) in two coats.

**Safety and Handling**

Refer to the Material Safety Data Sheet (MSDS) for the **BioBased 501w®**.

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 the remainder of the spray period on a low setting to prevent frothing.

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 501w®. 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 501w® water blown foam:**

When using **BioBased 501w®** after a chemically blown spray polyurethane foam it is necessary to flush the entire B-side hoses and gun with a non-water based solvent in order to achieve maximum foam quality and yield.

**Water blown foams followed by BioBased 501w®:**

Flushing the B-side hoses and gun with solvent may not be necessary when switching from one water blown foam system to the next, but it is important that any remaining product from the previous application is completely removed and flushed from applicator guns, lines and pumps by a throughput of **BioBased 501w®** product until test sprays indicate that the previous system has been completely replaced with **BioBased 501w®**.

**Containers**

Shipping weight per set is 1,032 pounds (468.1 kg). A set **BioBased 501w®** 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	
Drum Temp.	75 to 85°F (23.9 to 29.4°C)	75 to 85°F (23.9 to 29.4°C)	Hose
Proportioner Temp.		105 to 135°F (40.6 to 57.2°C)	
Pressure		1200 to 1600 psi (82.7 to 110 bar)	
Ambient Temp		50°F to 120°F (10°C to 49°C)	
Ambient Moisture		< 85% Relative Humidity	
Substrate Temperature		50°F to 120°F (10°C to 49°C)	
Moisture on Substrate		Substrate must be dry < 12% WMC	
Wind Velocity		< 12 m.p.h. < (19.3 km/h)	
Max Service Temp		< 180°F < (82.2°C)	

Properties	Value	Test Method
<b>Water Vapor Permeability†</b>		
3.5" (89 mm)	9.2 perms	ASTM E 96
5.5" (140 mm)	6.1 perms	ASTM E 96
<b>Air LeakageΔ</b>		
5.5" (140 mm) @ 75 PA	< 0.02 L/s/m <sup>2</sup>	ASTM E 283
<b>Closed Cell Content</b>	3.00%	ASTM D 2856
<b>Core Density (nominal)</b>	0.5 pcf (8 kg/m <sup>3</sup> )	ASTM D 1622
<b>Fungi Resistance</b>	Pass	ASTM C 1338
<b>Dimensional Stability</b>	< -5.0%	ASTM D 2126
<b>Surface Burning Characteristics*</b>	4" (101.6 mm)	ASTM E 84
<b>Flame Spread Index</b>	≤ 25	ASTM E 84
<b>Smoke Developed Index</b>	≤ 450	ASTM E 84
<b>Sound Transmission Class (STC)</b>		
2 x 4 (50.8 mm x 101.6 mm) wood studs, 1/2" (12.7 mm) gypsum	38	ATM E 90
<b>Tensile Strength</b>	3.0 psi (29.7 kPa)	ASTM D 1623
<b>Room Corner</b>	Pass	NFPA 286

Wall: 2 x 8 (50.8 mm x 203.2 mm) studs 24" (609.6 mm) o.c., Full Fill Foam.  
 Ceiling: 2 x 12 (50.8 mm x 304.8 mm) studs 24" (609.6 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 x 6 (50.8 mm x 152.4 mm) studs 24" (609.6 mm) o.c., Full Fill Foam  
 Ceiling: 2 x 10 (50.8 mm x 254 mm) studs 24" (609.6 mm) o.c., Full Fill Foam  
 Covered with Flame Control Foam Kote 50-50 at 100 ft<sup>2</sup>/gal (2.54m<sup>2</sup>/L) in two coats

R-Value Aged 90 days @ 140 F (60°C)	ft <sup>2</sup> ·°F·h/Btu	(K·m <sup>2</sup> /W)	
1" (25.4 mm)	R – 3.8	RSI – 0.67	ASTM C 518
3.5" (88.9 mm)	R – 13	RSI – 2.29	ASTM C 518
5.5" (139.7 mm)	R – 20	RSI – 3.52	***
7.5" (190.5 mm)	R – 28	RSI – 4.93	***
10" (254 mm)	R – 37	RSI – 6.52	***
11.5" (292.1 mm)	R – 43	RSI – 7.57	***

- Δ The International Residential Code defines air impermeable as having less than 0.02 L/m-s at 75 Pa.
- \* 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.
- † ASHRAE defines a Class III vapor retarder as a material having between 1 and 10 perms.
- \*\*\* Calculated Per ICC AC-377 and FTC Guidelines based on the K-Value at 3.5" (88.9 mm).

**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.

