



## **GUIDE SPECIFICATION BAYSEAL INSULATION FOR RESIDENTIAL ENVELOPE INSULATION**

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### **PART 1 -- GENERAL**

This guide specification discusses the application of the BaySeal™ sprayed in place insulation system for use in a building envelope insulation system. This guide specification is intended as a starting point for professionals to develop more complete specifications. Each project should be assessed on an individual basis.

#### **1.01 SCOPE OF WORK**

Furnish all labor, materials, tools and equipment necessary for the application of a BaySeal™ sprayed in place insulation system for a building envelope system. This includes accessory items subject to the general provisions of the contract.

#### **1.02 RELATED WORK SPECIFIED ELSEWHERE**

A. Rough Carpentry	Section 06100
B. Insulation, Other	Section 07200
C. Thermal Barrier	Section 07220
D. Vapor Retarder	Section 06100
E. Mechanical	Division 15
F. Electrical	Division 16

#### **1.03 QUALITY ASSURANCE**

All work is to be performed by applicators skilled in the application of BaySeal™ sprayed in place insulation system. Applicators shall have completed 5 similar projects over the last 5 years and shall provide a list of these projects to the owner or owner's representative upon request.

#### **1.04 SUBMITTALS**

- A. Manufacturer to provide current data sheets on all materials intended for use on the project.
- B. Shop drawings on sheet metal, accessories or other fabricated items, if required.
- C. Manufacturer's application and installation instructions.
- D. Safety and handling instructions for storage, handling and use of the materials including Material Safety Data Sheets (MSDS) on each product intended for use.
- E. Field Quality Control Procedures to be utilized by the contractor/applicator to insure proper installation of the BaySeal™ sprayed in place insulation system.

## **1.05 MATERIALS, DELIVERY AND STORAGE**

- A. Materials shall be delivered in the manufacturer's original, tightly sealed containers or unopened packages clearly labeled with the manufacturer's name, product identification, safety information, UL approvals, and batch or lot numbers where applicable.
- B. Containers shall be stored out of the weather and out of direct sunlight at temperatures within the limits specified by the materials manufacturer.
- C. All materials shall be stored in compliance with local fire and safety codes.

## **1.06 ENVIRONMENTAL CONDITIONS**

- A. BaySeal™ sprayed in place insulation system is provided in different reactivities to match differing ambient temperatures. Do not apply the BaySeal™ Sprayed in place insulation below the temperature (or below the dew point) specified by in BaySeal™ data sheets or as approved by BaySystems North America technical personnel.
- B. Apply thermal barriers and vapor retarder (if required) in accordance with the manufacturer's application instructions.

## **1.07 SEQUENCE OF SCHEDULING**

In new construction projects, the BaySeal™ sprayed in place insulation system is installed when the preparation of the perimeter wall/roof are in place and in coordination with other building trades.

## **1.08 SAFETY REQUIREMENTS**

All non-essential personnel are restricted from access to the area where the BaySeal™ Sprayed in Place Insulation is applied.

1. Post warning signs at all work area entrances to restrict entry by unauthorized personnel.
2. No welding or open flame.
3. Seal off work area from adjacent rooms and ventilation ducts.
4. Restrict access of non-application personnel including other trades.
5. Provide breathing and eye protection for spectators.
6. Provide ventilation as needed.

See **HEALTH AND SAFETY CONSIDERATIONS** at the end of this document

## PART 2 -- PRODUCTS

### 2.01 POLYURETHANE FOAM

- A. The BaySeal™ Sprayed in Place insulation shall be a two component system made by combining an isocyanate (A) component with a polyol (B) component and shall possess the following typical physical properties:

#### Typical Physical Properties\*

Properties	ASTM Test	Values
Density	D-1622	2.04 1.8 - 2.1 lbs/cu ft
Compressive Strength	D-1621	36.74 30 - 40 psi
Tensile Strength	D-1623	72.97 60 - 75 psi
Percent Closed Cell	D-2856	>90%
Insulation Values	ASTM C-518	
	k-factor	
	BTU-In/ft x ft deg F-Hr.	
	initial	0.153
	aged 140 deg F	0.16
	R Value	
ft x ft-deg F-Hr/BTU-in		
initial	6.54	
aged 140 deg F	6.25	
Spread of Flame**	ASTM E-84**	20**
Smoke** (4 1/2" sample)		<450**

\* Typical data as obtained from laboratory samples and value may vary under actual field conditions.

\*\* These flame-spread ratings are not intended to reflect hazards presented by this or any other material under actual fire conditions

B. Primer: Primer used shall be as recommended by BaySystems North America.

C. Fire Safety Requirements: See API Bulletin AX-119, "MDI - Based Polyurethane Foam Systems: Guidelines for Safe Handling and Disposal"

## **2.02 RELATED PRODUCTS**

A. Single Component Polyurethane Foam Sealants for use around windows, doors etc. shall be as approved by BaySystems North America.

B. 15-Minute Rated Thermal Barriers

1. Sprayed in place cementitious
2. Sprayed in place fiber
3. Minimum 1/2 inch gypsum board

C. Vapor Retarder (if required)

1. Asphaltic
2. Butyl
3. Chlorosulfonated Polyethylene
4. Polyethylene Film
5. Other

D. Substrate Primers (if Required)

1. Wood: BaySystems EC100
2. Galvanized: Wash Primer or BaySystems Aquapoxy
3. Concrete or Masonry: BaySystems EC 100 or BaySystems Aquapoxy

## **PART 3 -- EXECUTION**

### **3.01 APPLICATION OF PRODUCTS**

The products intended for use in the building envelope insulation system must be applied within the manufacturer's guidelines for temperature, humidity and other atmospheric conditions. In addition, they must be sequenced so as to take into consideration substrate preparation, proper cure times and inter-coat adhesion.

### **3.02 SURFACE PREPARATION**

All surfaces not to receive foam shall be carefully masked to avoid overspray. This includes (but is not limited to) beams, floors, windows, doors, fireplaces, appliances and any other surface which could be damaged by overspray.

### **3.03 EQUIPMENT**

Equipment shall be as recommended by BaySystems North America. Equipment

shall be capable of maintaining 1000 psi of pressure or higher and maintaining a minimum of 130 degrees. Equipment shall be capable of maintaining 1:1 ratio of A and B components on a continuous basis. Equipment shall be Graco/Gusmer, Glascraft or other approved equipment.

### **3.04 STORAGE OF MATERIALS**

Materials shall be maintained at a temperature of 60 degrees to 77 degrees F – see 1.05 (B) (preferably 70 degrees F). Temperatures below 60 degrees F can result in cavitation of the B side.

### **3.05 SUBSTRATE CONSIDERATION AND PREPARATION**

#### **A. Wood**

1. Plywood shall contain no more than 18% water, as measured in accordance with ASTM D-4449 and ASTM D-4444-84.
2. Most untreated and unpainted wood surfaces need not be primed. The spray polyurethane foam can be applied directly to the dry wood. Priming may be required in certain cases. Contact BaySystems North America for further information.

#### **B. Steel**

1. Primed: If the primed metal surface is free of scale, rust or chalking it normally does not require priming. Remove loose dirt or chalk by power washing prior to application of BaySeal™. Stainless Steel requires primer. Contact BaySystems North America for recommendations.
2. Previously painted: Clean the painted metal surface using hand or power tools to remove loose scale and rust. Grease, oil and other surface contaminants can be cleaned using a power washer.
3. Galvanized: On galvanized sheet surfaces, the surface shall be acid washed using vinegar or other approved acid. Primers shall be as recommended by BaySystems North America. Galvanized studs adhered to backer usually do not require primer.

### **3.06 PRIMER APPLICATION**

When required, the primer shall be applied to the properly prepared substrate in accordance with BaySystems North America recommendations to achieve the design coverage rate.

### **3.07 SPRAY APPLIED BAYSEAL™ FOAM INSULATION**

- A. BaySeal™ shall be processed at design temperatures and at a 1:1 ratio. See BaySystems North America for specific instructions.

- B. BaySeal™ is provided in several reactivities. Different reactivities are designed to be sprayed on substrates of varying temperatures. Contact Bay Systems of North America to establish the proper reactivity for the design temperature.
- C. Atmospheric Conditions: BaySeal™ shall not be applied when the temperature is within 5 degrees F of the dew point. In an exterior application, BaySeal™ shall not be applied when wind speeds exceed 12 miles per hour.
- D. BaySeal™ shall be applied in multiple passes, minimum 1/2 inch thick, to the design thickness. For winter application consult BaySystems North America technical personnel for specific instructions.

The full thickness of BaySeal™ is to be applied in the same day.

Note: When applying BaySeal™ over gypsum board, the first pass shall be no more than one inch in thickness.

### **3.08 VAPOR RETARDER APPLICATION**

When required, a vapor barrier shall be applied to the warm side of the BaySeal™ insulation. In low temperature applications or in high humidity conditions, consult BaySystems North America for specific instructions.

### **3.09 THERMAL BARRIER APPLICATION**

The interior surface of BaySeal™ must be covered with an approved 15 minute thermal barrier. The thermal barrier must be applied in accordance with the manufacturer's instructions.

### **3.10 CLEAN UP**

After the installation of BaySeal™ is complete, the installer is to remove all masking from protected surfaces. In stud wall applications, all studs are to be scraped to allow for the application of gypsum board. Collect all trash and debris and remove from the site, leaving the site in a clean and orderly condition.

## **PART 4 -- HEALTH AND SAFETY CONSIDERATIONS**

### *Health and Safety Information*

Because health and safety considerations cannot be overemphasized when using polyurethanes, appropriate literature has been assembled to provide information concerning the health and safety precautions that you must observe when handling BaySeal™ insulation systems. Before working with these products, you must read and become familiar with the available information concerning their hazards, proper use and handling. Information is available in several forms, including [Material Safety Data](#)

[Sheets \(MSDS\)](#) and product labels. For specific health & safety questions on your particular BaySeal™ insulation system, consult your local BaySystems representative to obtain assistance from Bayer's Product Safety & Regulatory Affairs Department located in Pittsburgh, PA.

Material Safety Data Sheets are supplied with all BaySeal™ insulation systems and list specific safety recommendations. You must read these thoroughly before handling any chemical, and be sure to keep them on file for ready reference.

For materials that are not BaySystems North America products, always be sure to follow the appropriate industrial hygiene and other safety precautions recommended by the manufacturer.

Examples of supplemental health and safety information that can be obtained in support of this product include:

- Bayer's Progressive Product Stewardship Program at [www.BayCareOnline.com](http://www.BayCareOnline.com)
- Alliance for the Polyurethanes Industry at [www.polyurethane.org](http://www.polyurethane.org)
- Spray Polyurethane Foam Association at [www.sprayfoam.org](http://www.sprayfoam.org)
- Canadian Urethane Foam Contractors Association at [www.cufca.ca](http://www.cufca.ca)

### *Basic Safety*

#### **Potential Health Hazards**

Polyurethane systems have two main components that are mixed together: isocyanates (i.e., MDI) and polyols. The polyols are considered to be the less hazardous of the two, but still require safe handling and storage practices. For example, polyols usually contain amine catalysts. Amines are a family of chemicals that can cause eye, skin and respiratory tract irritation. Certain individuals also may become sensitized to amines and may experience respiratory and skin effects.

Like other chemicals, MDI can be used safely if recommended procedures are carefully followed. At all times, your workers must be protected from potential chemical overexposure. Contact with MDI vapors, aerosolized MDI, or liquid MDI, above the published exposure limits, can be harmful to your health.

The four possible ways in which you may become overexposed to MDI are:

#### **1. Inhalation:**

If MDI is sprayed as a mist, heated, or otherwise aerosolized, there is a potential for over-exposure. Furthermore, over-exposure to airborne MDI can irritate your nose, throat and lungs, and you may feel tightness in your chest or have difficulty breathing. Irritation effects are generally reversible. Overexposure also may cause you to become sensitized or "allergic" to MDI, resulting in asthma attacks upon exposure to relatively low concentrations of airborne MDI. Extreme asthmatic reactions can be

life threatening.



## 2. Skin Contact:

Contact with MDI may produce contact dermatitis and in extreme cases, skin sensitization. Repeatedly getting MDI on your skin also may cause redness, itching and swelling; therefore, it is best to conduct your work in the proper way to prevent skin contact.

## 3. Eye Contact:

Direct contact with liquid MDI may cause slight irritation (e.g., reddening, tearing, stinging and swelling), but permanent corneal damage is unlikely. Contact with MDI vapor may also cause irritation.

## 4. Ingestion:

MDI has a relatively low level of oral toxicity; however, good hygienic practices (i.e., do not smoke, eat or drink in areas where MDI is used) should be utilized to minimize the accidental ingestion of MDI. Upon ingestion, no significant adverse effects are expected.

## Safe Work Practices

By implementing the proper precautions, you can use MDI safely and protect yourself from over-exposure. Where there is *adequate ventilation and minimal chances for contact*, you should use:

- Safety glasses or chemical splash goggles, or chemical splash goggles with face shield where there is a greater risk of splash.
- MDI-resistant chemical gloves (e.g., nitrile rubber, butyl rubber, or neoprene).
- Safety shoes or boots.

When there is a risk of exposure to MDI liquid, vapor or mist above the allowable exposure limits (e.g., spraying or heating), you should use the following Personal Protective Equipment (PPE):

- Chemical splash goggles, and/or chemical splash goggles with face shield where a half-mask APR is permitted.
- MDI-resistant gloves (e.g., nitrile rubber, butyl rubber, or neoprene).
- MDI-resistant long-sleeve coveralls or full body suit.
- MDI-resistant fitted boots.

- Head protection, such as a close-fitting hood.
- Respiratory protection that is chosen based upon the airborne MDI level and conditions of use. Use of such equipment is subject to the requirements set forth in the Occupational Safety and Health Administration's (OSHA's) Standard on Respiratory Protection (29 CFR § 1910.134). The types of respirators that may be used in this application include: supplied air respirators (SARs), operated in pressure-demand or continuous flow mode, or, to a lesser extent, air-purifying respirators (APRs). Various types of SARs and APRs are subject to assigned protection factors, fit factors and other criteria, which depending upon the airborne MDI concentration, will limit their use.

When using respiratory protection, the level and type of respirator is dependent upon the airborne MDI exposure conditions. Nearby assistants or bystanders also may be required to wear respiratory protection depending upon the number of sprayers, the geometry of the surface to be sprayed and the wind speed/direction.

### **Medical Surveillance (Employee Health) Monitoring**

Many employers currently require pre-placement and periodic medical examinations of their employees in order to establish an individual's fitness for duty. In addition, OSHA requires medical evaluations for employees required to wear respirators. A medical surveillance program specific to the safe use and handling of MDI is recommended for a worker using/handling the BaySeal™ insulation system .

### **Other Items to Consider:**

It is important to remember to act responsibly when handling MDI, or any chemical. To ensure proper handling, follow established procedures, guidelines and precautions listed on documents such as the *current MSDS*.