

## *Application Specification:*

**Gaco WallFoam  
(Half-Pound)**  
February 2009  
Supersedes 01/09

### **GUIDE SPECIFICATION GACO WESTERN OPEN CELL WALLFOAM INSULATION**

#### **PART 1 – GENERAL**

This guide specification discusses the application of Gaco Western sprayed in place polyurethane foam for use as 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 Gaco Western's polyurethane foam. 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 Gaco Western polyurethane foam systems. 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 Gaco Western 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.

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B. Containers shall be stored out of the weather and away from 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. Do not apply the Gaco Western Sprayed in place insulation below the temperature specified in Gaco Western data sheets (or within 5 degrees of the dew point) or as approved by Gaco Western's technical personnel.

B. Apply thermal barriers and vapor retarder (if required) in accordance with local building code requirements.

### 1.07 SEQUENCE OF SCHEDULING

In new construction projects, Gaco Western 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 Gaco Western 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 Gaco Western 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:

#### ASTM TEST VALUES

Density (D-1622-98): 0.45 – 0.55 lbs/ft<sup>3</sup>

Closed Cell Content (D-2856-94): <0.6 %

Aged R Value (C-518), tested at 75°F (23.9°C): R at 1 Inch: 4.21

R at 4 Inches 15.64

**NOTE: Federal Trade Commission regulations published in the Federal Register 16 CFR Part 460 require that “R” value testing of polyurethane foam insulation must be conducted on aged samples at a 75°F mean test temperature. Failure to comply can result in substantial fines by the FTC.**

Flame Spread / Smoke Developed: 25 Flame / 250 Smoke  
(ASTM E84-05, Also known as ANSI 2.5, NFPA 255, UBC 8-1 (42-1) and UL 723)

Typical data as obtained from laboratory samples and actual value may vary under field conditions.  
Note: 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 Gaco Western.

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 Gaco Western.

B. Examples of 15-Minute Rated Thermal Barriers

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

C. Vapor Retarder (if required)

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

## 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-pass 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 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 type.

### 3.04 STORAGE OF MATERIALS

Materials shall be maintained at a temperature of 65° to 77°F.

A and B chemical temperature must be 70-75°F or higher before spraying. Material temperatures below 70°F can result in proportioning errors and/or insufficient heat at the spray gun.

### 3.05 SUBSTRATE CONSIDERATION AND PREPARATION

A. Wood

1. Plywood shall contain no more than 18% water.
2. Most untreated and unpainted wood surfaces need not be primed. Spray polyurethane foam can be applied directly to the dry wood. Priming may be required in certain cases. Contact Gaco Western for further information.

B. Steel

1. Primed: If the primed metal surface is free of scale, rust or oils it normally does not require priming. Remove loose dirt or contaminants by power washing prior to application of Gaco Western's polyurethane foam. Stainless Steel requires primer. Contact Gaco Western 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: Primers shall be as recommended by Gaco Western. 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 Gaco Western recommendations to achieve the design coverage rate.

### 3.07 SPRAY APPLIED GACO WESTERN FOAM INSULATION

A. Gaco Western polyurethane foam shall be processed at design temperatures and at a 1:1 ratio. See Gaco Western for specific instructions.

B. Gaco Western polyurethane foam is designed to be sprayed over a wide range of substrate temperatures. For very cold conditions contact Gaco Western.

C. Atmospheric Conditions: Gaco Western shall not be applied when the temperature is within 5 degrees F of the dew point. In an exterior application, Gaco Western shall not be applied when wind speeds exceed 15 - 20 miles per hour.

D. Gaco Western polyurethane foam shall be applied in multiple passes, minimum 3/4" thick, maximum 6" per pass. For winter application consult Gaco Western technical personnel for specific instructions. The full thickness of Gaco Western polyurethane foam is to be applied in the same day.

**Note:** When applying Gaco Western polyurethane foam 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 Gaco Western insulation. In low temperature applications or in high humidity conditions, consult Gaco Western for specific instructions.

### 3.09 THERMAL BARRIER APPLICATION

In interior applications Gaco Western polyurethane foam 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 Gaco Western 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 Gaco Western 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 Gaco Western insulation system, consult your local Gaco Western representative.

Material Safety Data Sheets are supplied with all Gaco Western 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 Gaco Western products, always be sure to follow the appropriate industrial hygiene and other safety precautions recommended by the manufacturer.

### 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. Possible routes of exposure 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.