FOAM BOOK

EDUCATION ABOUT SPRAY FOAM **BOOK 2**

INSIDE: **SPF & Thermal Barriers • SPF & Safety • Personal Protective Equipment**

SUSTAIN YOUR BUSINESS THROUGH KNOWLEDGE

At Covestro, we're dedicated to helping you build and sustain your business. We've created this series of educational books to help you learn more so that you can sell more spray foam. Your success is our business, and we're here to help you every step of the way.

Covestro provides spray foam wall insulation systems, roofing spray foam insulation systems, and a full line of specialty coatings that are used for thermal and moisture protection, roofing, waterproofing, abrasion resistance, and other applications. Covestro products enhance the total building envelope to provide sustainability, durability, energy efficiency, and improved occupant comfort.

For more information go to www.polyurethanes.covestro.com

Thermal

Barriers:

What they are:

A thermal barrier slows the temperature rise of the material behind it during a fire. According to the ASTM E119 test method, the temperature of the underlying Spray Polyurethane Foam (SPF) cannot exceed 250°F (121°C) after 15 minutes of fire exposure.

The following are examples of thermal barrier materials:

*Tested to the requirements of ASTM E-119.

When to use a thermal barrier

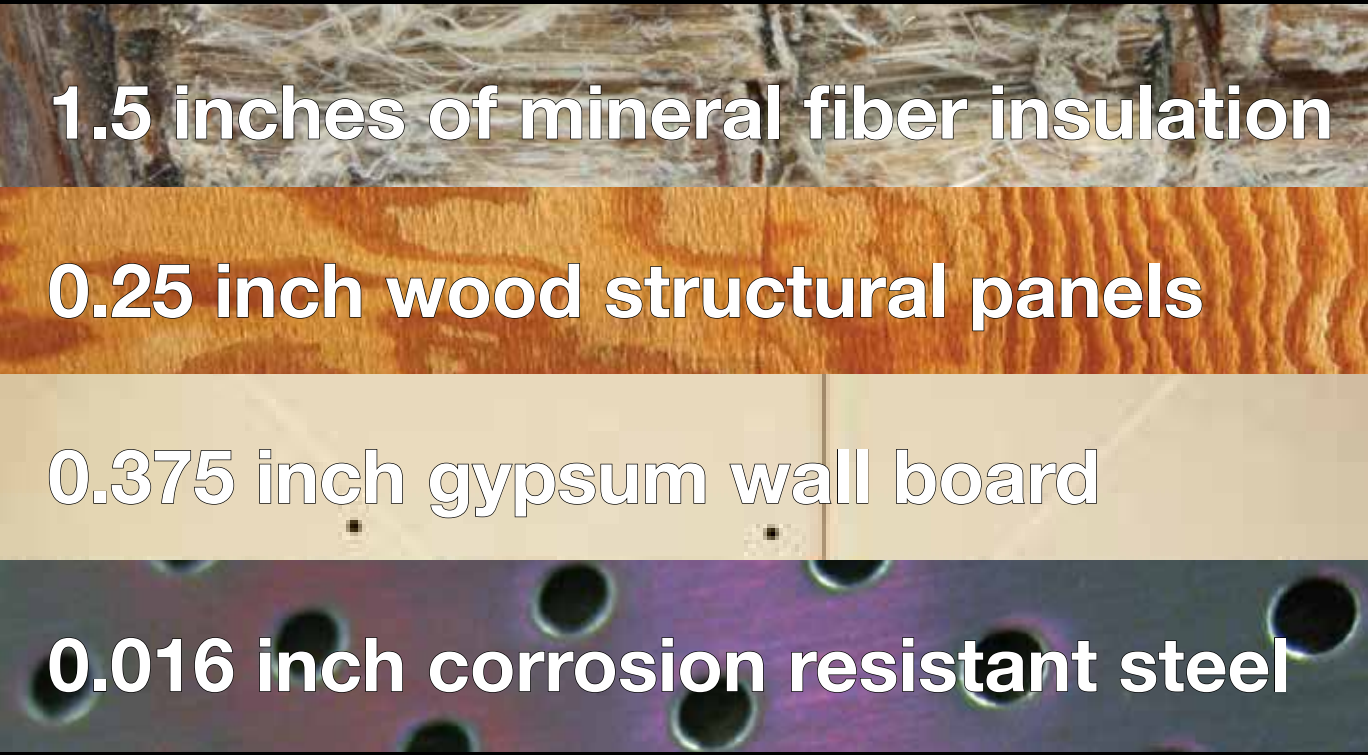
SPF insulation in a building MUST be covered with an approved thermal barrier to separate it from the occupied space. An exception is allowed in areas where access is limited to service of utilities, such as attics and crawl spaces, where an approved *ignition* barrier is required. It's critical to stay informed of the current local building codes to ensure usage is compliant.

Ignition

Barriers:

What they are: Ignition barriers are protective coverings that provide some resistance to ignition for combustible materials.

Building codes define four materials as prescriptive ignition barriers:



Using any of these materials over SPF insulation meets the requirement of an ignition barrier. No testing is needed.

Alternatives to Ignition Barriers:

In practice, the code-prescribed ignition barrier coverings can be cumbersome or costly to apply, and the building codes allow other systems to be qualified as alternatives.

To qualify, an alternative system must perform equal to or better than a test assembly constructed using one of the four code-prescribed ignition barrier coverings using one of several well-established large-scale flammability tests.

Bayseal® OC and Bayseal® CC SPF coated with Bayseal® IC, a spray applied coating, have been tested in a large-scale flammability test[1] and have performed better than a comparable SPF assembly covered with a code-prescribed ignition barrier. This test result allows Bayseal® OC and CC, coated with 0.005 inch of Bayseal® IC coating to be used as an acceptable alternative to a code-prescribed ignition barrier. This thickness equates to a coverage rate of 1 gallon per 160 square feet. More information about Bayseal® IC can be found at www.polyurethanes.covestro.com.

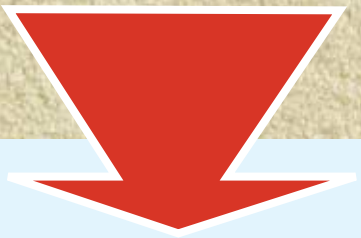
[1]*Modified NFPA 286 test, as approved by ICC-ES in their June, 2009 committee hearings: this large-scale flammability test can be used for qualifying alternatives to ignition barriers with SPF assemblies.*

Safety:

This section introduces the importance of safe handling of materials and the use of required personal protective equipment (PPE) when applying SPF.

This discussion is not intended to be a complete source of information on the topic of safety. More comprehensive information is provided on the http://www.productsafetyfirst.covestro.com/ web page, under the "NAFTA" tab. In particular, refer to the document titled "Spray Polyurethane Foam Insulation: Safe use and handling guidelines for installers". Additional references for more information on the safe handling and use of SPF are provided at the end of this book.

SPF, when properly installed and fully cured, is a safe material. However, the installation of SPF requires special care because the liquid components used to produce SPF present potential health hazards. The two liquid components that react together to form SPF are commonly referred to as A-side and B-side.



Before working with any SPF chemicals you need to read and understand the Safety Data Sheets (SDS) for the A-side and B-side. The SDS for Covestro's SPF systems are available at: http://www.productsafety-first.covestro.com/

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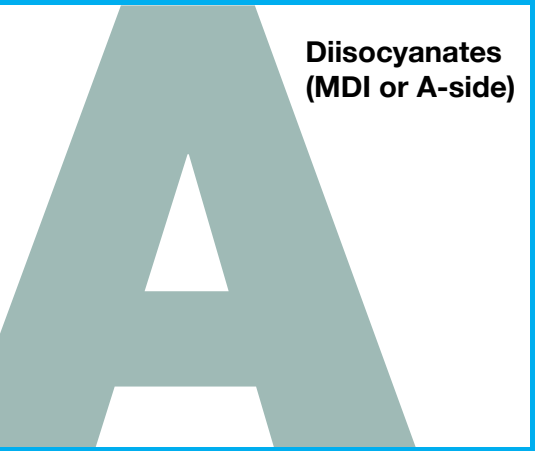

Diisocyanates (MDI or A-side)

Polyol-based resin blends (B-side), primarily comprised of polyols, with smaller amounts of catalysts, blowing agents, flame retardants, and surfactants.

Regulatory agencies have established limits for worker exposure to the airborne A-side chemical, and monitoring studies during SPF installation have shown these limits are typically exceeded. Therefore spray applicators, and all other workers in the vicinity of the SPF installation must wear appropriate PPE.

Personal Protective Equipment:

Individuals handling chemicals need to understand and practice safe handling techniques for MDI and other chemicals that pose potential health hazards. Spray foam applicators and all of the workers in the vicinity of SPF installation MUST wear appropriate personal protective equipment. This includes the wearing of the appropriate protective equipment including:

1. Respiratory protection
2. Eye protection
3. Skin protection
4. Hand protection
5. Foot protection

Over-exposure to some of the components in the A-side

A-side

Inhalation overexposure can cause

1) Irritation of the nose, throat, and lungs, causing runny nose, sore throat, coughing, tightness in the chest, and shortness of breath.
2) Respiratory tract sensitization (i.e., the development of asthma) with symptoms of chest tightness, shortness of breath, coughing, and/or wheezing.

Skin contact can cause

1) Irritation
2) Sensitization (allergy) — Symptoms of both include reddening, itching, swelling, and rash.
3) Note that skin contact alone may possibly lead to respiratory sensitization.

Eye contact can cause

1) Reddening
2) Tearing
3) Stinging, and/or
4) swelling of the eyes.

More information about A-side and B-side health effects and recommended PPE can be found in the document titled "Spray Polyurethane Foam Insulation: Safe use and handling guidelines for installers", found at: http://www.productsafetyfirst.covestro.com/

and B-side is potentially hazardous to your health.

B-side

Inhalation overexposure can cause irritation of the respiratory tract, causing coughing, sore throat, and runny nose. Irritation of the eyes (liquid or vapor) and skin (liquid) is also possible. Cardiac arrhythmia (irregular heartbeat) is a symptom of overexposure to certain blowing agents. In addition, the vapors of some amine catalysts can temporarily cause vision to become foggy or blurry, and halos may appear around bright objects such as lights.

Refer to the safety data sheets (SDS) for a complete listing of the composition and potential health effects of A and B-side chemicals.

Due to the potential health hazards just mentioned and the fine mist that is produced by the spray application, it is important to avoid inhalation of, and skin and eye contact with, SPF chemicals.

Before working with any of the chemicals, you'll want to read and understand the Safety Data sheets for the A-side and B-side chemicals. These are available at: http://www.productsafetyfirst.covestro.com/

What type of personal protective equipment should **applicators** wear during spraying?

- A NIOSH-approved full face or hood-type supplied air respirator operated in positive pressure or continuous flow mode.
- Disposable coverall with attached hood
- Disposable over-boots
- Fabric gloves coated with nitrile, neoprene, butyl, or PVC

What type of personal protective equipment should **helpers** wear during spraying?

- Helpers working on the same floor as the applicator should wear the same PPE worn by the applicator, except that disposable over-boots may not be necessary.
- In some cases, such as when the work area is well ventilated or when helpers are not working in the immediate vicinity of the applicator, helpers may be able to wear full face air purifying respirators with organic vapor/particulate (P100) cartridges instead of supplied air respirators. Professional judgement must be exercised in making this determination, taking into account the specifics of the job site and application.
- Note that PPE should also be worn during post-spray activities, such as trimming of foam and clean-up activities.

What type of personal protective equipment should be worn during handling of liquid SPF chemicals?

- Chemical safety goggles
- Nitrile, neoprene, butyl, or PVC gloves
- If splash to the body is possible, impermeable protective clothing (e.g., PVC, polyethylene)
- If handling heated SPF chemicals, NIOSH-approved air purifying respirator with combination organic vapor/particulate (P100) cartridges
- Steel toe safety shoes should be worn when moving drums.

Important Notes About Respiratory Protection

Where the use of respirators is required on the job, the Occupational Safety & Health Administration (OSHA) requires the following of the employer, among other items:

- Develop and maintain a written respiratory protection program.
- Ensure that employees undergo a medical evaluation by a licensed health care professional to determine their fitness for using a respirator.
- Ensure that employees who wear respirators with tight-fitting facepieces have an annual respirator fit test.
- Ensure that employees who are required to use respirators receive annual training.

What are some good work practices to employ to protect building occupants and property during interior SPF application?

- Ideally, no other persons should be in the building during SPF application. Where this is not possible or practical, discourage entrance by using barrier tape and/or signs to establish a perimeter around the work area. Containment of the work area in combination with active ventilation (i.e., fan/blower exhausting to the outside of building) should also be considered. Access should be restricted near the exhaust point(s). Do not locate exhaust points near air intakes.
- Shut down and temporarily seal off (e.g., plastic sheeting and tape) HVAC system components in the work area.
- Avoid spraying foam too thickly in a single lift, and allow sufficient time between lifts. Failure to take these precautions may cause foam to char, smolder, or burn.
- The application area should be ventilated for a period of time following installation to purge mist and vapors from the structure. One example is via fans exhausting air at one side (restrict access near exhaust point[s]), and open windows/doors on the opposite side. The amount of time required will depend on the size of the area, amount of foam applied, the particular foam formulation applied, ventilation rate, etc. Entrance by others may be permitted following this ventilation period.
- Warning signs should be prominently displayed at all entrances to the work area identifying the fire dangers of open flames, welding, sparks, etc. until a thermal barrier (e.g., drywall) is applied over the installed foam.

Take responsibility for your own safety.

RESOURCES:

- Covestro Product Stewardship Program, available at http://www.productsafetyfirst.covestro.com/
- Safety Data Sheets for the A and B-side chemicals, available at http://www.productsafetyfirst.covestro.com/
- Report: Spray Polyurethane Foam Insulation Safe use and handling guidelines for installers, available a http://www.productsafetyfirst.covestro.com/Country/USA/Spray-Polyurethane-Foam.aspx.
- Center for the Polyurethanes Industry at www.polyurethane.org. Select “Safety” or “Health”.
- Spray Polyurethane Foam Alliance web site: www.sprayfoam.org. Select “Health & Safety”.
- Spray Polyurethane Foam Health and Safety website www.spraypolyurethane.com

Go to www.polyurethanes.covestro.com
to learn more about the competitive advantages
of spray polyurethane foam.

DOWNLOAD:

Product Datasheets
Specifications
Project Profiles

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