



# UNIVERSAL POLYMERS CORPORATION

A Division of General Manufacturing Coatings Corp.

## SPF (SPRAY POLYURETHANE FOAM) BASICS



Whether retro-fitting a home or choosing insulation when building a new one, spray polyurethane foam (SPF) insulation is among the best ways to increase energy efficiency and improve comfort.

### What is SPF and How Does it Work?

SPF, a spray-applied cellular plastic, is made by mixing chemicals to create foam. Those chemicals react very quickly, expanding on contact to create foam that insulates, air seals and provides a moisture barrier. When properly installed, SPF forms a continuous barrier on walls, around corners and on contoured surfaces. It resists heat transfer very well and is an effective solution for reducing unwanted air infiltration through cracks, seams, and joints.

SPF insulation applied by professionals is usually described as either a high- or low-pressure foam and is available as either open or closed cell. Each type has advantages and disadvantages depending on the application requirements. The comparison chart below can be helpful in explaining or understanding which type of SPF insulation is best suited to a specific application.

### Closed Cell vs. Open Cell Foam: A Comparison

 Closed Cell	 Open Cell
Higher R-value (greater than 6.8 per inch)	R-value (greater than 3.5 per inch)
High moisture barrier (lower moisture permeability)	Lower moisture barrier (higher moisture permeability)
Air barrier	Air barrier at full wall thickness
Higher strength and rigidity	Lower strength and rigidity
Resists water	(Not suggested for applications in direct contact with water).
Medium density (1.85 – 2.35 lbs./ft <sup>3</sup> )	Lower density (0.45 – 1.2 lbs./ft <sup>3</sup> )
Absorbs sound	Absorbs sound very well

### More About the Chemicals and How They React:

Two liquids combine during a chemical reaction to form SPF. The two liquids come in different drums or containers, and professionals generally refer to one container as the A side and the other container as the B side.

The A side of a spray polyurethane system is commonly comprised of methylene diphenyl diisocyanate (MDI) and polymeric methylene diphenyl diisocyanate (pMDI). The B side is typically a blend of polyols, catalysts, blowing agent, flame retardant and surfactant. Note that the A and B sides may be reversed outside of the U.S.





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## SPF (SPRAY POLYURETHANE FOAM) BASICS (CONT.)

The polyols are part of the chemical reaction to make foam. The remaining ingredients in the B side serve different purposes to help control the creation of the foam bubbles (the “cells”) in an optimal way, and to provide the various characteristics of the finished foam product (flame retardancy, for example).

After the chemicals are mixed and reacted, the foam hardens very rapidly. The time to complete depends on the type of SPF insulation and other variables.

Safety Data Sheets (SDS) are available for both A and B side chemicals. As a SPF professional, it's important that you understand the information on safety sheets and are able to share the details with your customers.

### Educating the Customer

Professionals will want and need to give their customers guidance about the process for installation and time when they can reenter their home after an interior, two component foam insulation application.

Part of that guidance will be explaining that interior, two component foam is applied with the professional using specific personal protective equipment (high pressure foam is installed while using a respirator, for example). It is encouraged that professionals explain clearly to customers that this equipment, coupled with certain work and engineering practices, including ventilation, is used to minimize exposure to the chemicals used to make SPF during the job.

Further, professionals will want to share how homeowners can minimize or eliminate their exposure to the chemicals used to create spray foam by carefully following guidance about not occupying the home or space during the insulation, job completion and clean up for an appropriate period after.



Please let us know if you have questions or concerns, so we may address them.  
We are here to help.