

Benefits of Closed-Cell Spray Polyurethane Foam Air Barrier Technology

There are many considerations when designing a building to optimize heating and cooling efficiency, control moisture and provide occupant comfort in all climates. The case for well-designed air barrier systems is strengthening as expectations for improved energy efficiency and building performance grow. Air barriers are systems of materials used to control the unintended movement of air into and out of a building enclosure. A building enclosure includes all “six sides” of a building — exterior walls, roof and foundation floor — and may also include separations within the structure.

Although there are many materials that meet minimum criteria for air barriers, closed-cell spray polyurethane foam (ccSPF) offers unique benefits that make it a preferred choice. According to many designers, builders and enclosure specialists, ccSPF is one of the leading materials that helps meet (and in many cases, exceed) air barrier code and performance requirements.

Benefits of ccSPF Air Barrier Systems

With a proven performance record, ccSPF offers an integrated air barrier solution providing superior thermal insulation, while helping prevent moisture and air infiltration. The key elements affecting air infiltration are wind, stack effects and pressure differentials. Let’s take a look at the many benefits that a well-designed ccSPF air barrier system can provide. CcSPF can help:

- Create an effective air barrier due to its superior air sealing capabilities (nearly zero air permeance).
- Mitigate the “wind” and “stack effect” by reducing or eliminating air infiltration/leakage from the building envelope (conforms to unusual shapes and fills voids common in building enclosures).
- Simplify the air barrier design process (offers “all-in-one” air sealing, thermal insulation, moisture resistance and adhesive properties).
- Inhibit mold and mildew growth (minimizes air infiltration that can generate condensation). Note: The U.S. Federal Emergency Management Agency (FEMA) considers ccSPF to be a flood-damage resistant construction and insulation material.¹
- Address increasingly stringent air barrier and building/energy conservation codes and standards.
- Reduce labor and insurance costs* (since ccSPF is installed in a single operation, it does not require large crews, fasteners, glues or torches).
- Qualify* for energy rebates, tax credits and other sustainability/green building designations, such as Leadership in Energy and Environmental Design (LEED) certification or Energy Star[®] certification.

The effectiveness of air barrier systems vary depending on many factors, including the type of assembly, the material choices, the installation quality and how well the system is integrated into the overall building enclosure system. For diagrams of common ccSPF applications, view Honeywell’s document: Closed-Cell Spray Polyurethane Foam Insulation: A Preferred Air Barrier System in Building Envelopes.

Additional Benefits of ccSPF Air Barrier Systems

Along with the benefits of ccSPF as an air barrier system, it offers many additional advantages as a high quality insulation and air sealing material. For example, ccSPF can help:

- Lower energy bills[†] by improving energy efficiency (air seals and insulates).
- Resist heat transfer better than many other insulation materials (R-values[†] are typically >6.0 per one inch of thickness).
- Reduce the load on heating and cooling systems (HVAC sizing can be reduced as much as 35% without the loss of efficiency and comfort).²
- Deliver high structural (racking) strength (adheres to exterior sheathing and studs, adding rigidity).
- Resist settling due to its rigidity and stability (some other insulations tend to “settle” or slip down the stud cavity over time).
- Increase occupant comfort by reducing drafts.
- Absorb sound and reduce noise.
- Impede the entry of insects and pests.



Specify ccSPF For Your Next Air Barrier System

There are many challenges when designing an effective air barrier system. As you've seen, ccSPF's unique benefits such as self-adhesion, moisture resistance, strength, durability and outstanding air sealing/insulating capabilities, make it a preferred air barrier material. Along with its outstanding performance characteristics, ccSPF continues to grow in popularity due to its ability to simplify the air barrier system design process, compatibility with other materials/systems and ease of application.

Talk to a professional spray foam contractor about your next air barrier system. Also, consider specifying a ccSPF product that uses a blowing agent, such as Honeywell's Enovate® blowing agent (HFC 245fa) or Solstice™ Liquid Blowing Agent which has improved performance and environmental properties. These Honeywell blowing agents are approved by the U.S. Environmental Protection Agency (EPA) under the Significant New Alternatives Policy³ (SNAP) to replace ozone depleting substances. Honeywell continues to advance SPF blowing agent technology providing leadership to meet evolving industry requirements.

Discuss the latest in ccSPF and blowing agent technology with Honeywell or your spray foam supplier.

Sources:

1. FEMA Technical Bulletin 2-08 (replaces 2-93): Flood Damage-Resistant Materials Requirements (August, 2008). www.FEMA.gov.
2. Canadian Urethane Foam Contractors Association. www.cufca.com.
3. Significant New Alternatives Policy (SNAP) program. EPA website. www.epa.gov/ozone/snap/foams/lists/comm.html.

What makes ccSPF so effective?

CcSPF insulation is spray-applied on site during new construction or renovations to air seal/insulate wall cavities, crawl spaces, attics and basements. It can also be used as continuous external insulation for walls and as a roofing system. It is sprayed as a liquid that immediately expands to many times its original volume upon installation. As it expands into foam, it adheres and contours to the spray surface, filling in cracks and crevices that can cause air and water infiltration. Not only can ccSPF help prevent damage during severe weather, it provides excellent insulating and air sealing capabilities which can lower energy costs* and may qualify for rebates and tax credits.

*Since many variables impact ccSPF material and installation costs, it is preferable to discuss the project budget, return on investment (ROI), potential energy savings and possible rebates, tax credits or green certification (e.g. LEED credits) with the SPF manufacturer or contractor.

†Savings can vary. Check your SPF seller's fact sheet for specific R-values when comparing SPF to other insulations.

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Honeywell Performance Materials and Technologies

101 Columbia Road
Morristown, NJ 07962-1053

Phone: 1-800-631-8138

www.honeywell-refrigerants.com

12-09-EBA
February 2013 Printed in U.S.A.
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