

The Case for Improved Energy Performance in Residential Construction

Consumers want homes that are energy efficient, long lasting, safe and comfortable to live in. Better energy performance and building durability have become key components of building codes and green building programs. Many architects, builders and homeowners are turning to closed-cell spray polyurethane foam (ccSPF) as the preferred insulation and air sealant for residential construction and renovations. CcSPF provides consistent and unparalleled airtightness, thermal performance, moisture control and even structural benefits.

Why Is Improved Residential Energy Performance Important?

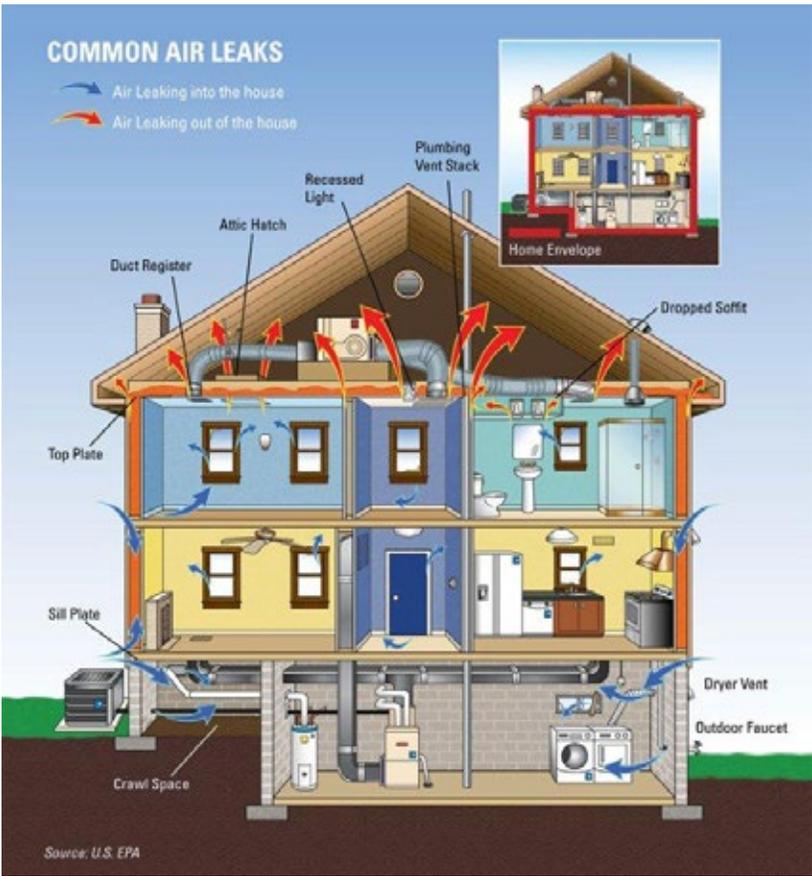
Before further exploring the benefits of ccSPF insulation, it is important to look at some of the reasons that demand is growing for more energy efficient homes. Some of the key factors include:

- Homes account for 21% of the energy used in the United States each year. In fact, the average home releases twice as much greenhouse gas into the atmosphere as the average vehicle. The residential sector contributes 335 million metric tons of carbon to the atmosphere each year.¹
- According to the Air Barrier Association of America (ABAA)², a “typical 2,500-square-foot home has more than a half mile of cracks and crevices.” Unsealed, about a third of the air leakage in a home occurs through floors, walls and ceilings.
- Air infiltration can account for 30% or more of a home’s heating and cooling costs and can contribute to problems with moisture, noise, dust, and the entry of pollutants, insects, and rodents.³
- The annual energy bill for a typical single family home in the U.S. is approximately \$2,200. Heating, cooling and hot water account for about 50-70% of energy used in homes.⁴
- A study by National Association of Home Builders (NAHB) indicated that “61% of consumers would spend more than \$5,000 upfront to save on utility costs.”⁵
- Energy efficiency and occupant comfort — two key ingredients of sustainable design — are driving the use of air barriers across the construction industry.



- Energy codes from the 1980’s through 2006 had modest energy improvements of 1 to 3% per code cycle. The 2012 International Energy Conservation Code (IECC) represents a 30% improvement relative to the 2006 IECC (Note: the 2015 IECC is a 50% improvement relative to 2006).⁶

According to the U.S. Energy Information Administration (EIA)⁷, it is expected that household expenditures for natural gas, heating oil and electricity will continue to rise, driving homeowners to more carefully evaluate their home’s energy performance. In addition, federal, state and local governments are focusing efforts to conserve energy in the residential sector to improve national energy security and reduce reliance on foreign oil. This will lead to further changes to building codes to increase the standard of energy performance. Codes are also recognizing that “how” insulation is installed is just as important as “how much” insulation is installed.



Why Is ccSPF so Effective?

According to many design experts and builders, ccSPF is one of the leading materials that helps meet (and in many cases, exceed) air barrier code and performance requirements. CcSPF insulation is spray-applied by SPF professionals on site during new construction or renovations to provide an effective thermal and air barrier. It is used to air seal/insulate wall cavities, crawl spaces, attics and basements. It is also used to insulate exterior walls and as a roofing system. It is sprayed as a liquid that immediately expands to approximately 30 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. CcSPF has a commonly accepted R-value* >6.0 per one inch of thickness.

“Sealing and insulating the “envelope” or “shell” of your home — its outer walls, ceiling, windows, doors, and floors — is often the most cost effective way to improve energy efficiency and comfort. Energy Star® estimates that a knowledgeable homeowner or skilled contractor can save up to 20% on heating and cooling costs (or up to 10% on their total annual energy bill) by sealing and insulating.⁸⁷”

-- Energy Star



Advancements in SPF Blowing Agent Technology

CcSPF expands through the use of a blowing agent, which helps create tiny cells in the foam. High performance blowing agents help provide excellent insulating properties, similar to the way insulating gas is used in double-pane glass for windows. 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 Policy⁹ (SNAP) to replace ozone depleting substances. They are the preferred choice for many ccSPF products worldwide. Honeywell continues to advance SPF blowing agent technology providing leadership to meet evolving industry requirements.

Discuss the latest blowing agent technology with Honeywell or your spray polyurethane foam supplier.

Visit www.honeywell-solstice.com.

Specify ccSPF Insulation for Your Next Project

CcSPF offers a cost effective thermal barrier, air barrier and vapor retarder — all in a single application. In addition, it can improve structural strength and reduce noise in the home. Although the initial installed cost of ccSPF may appear higher than some alternative insulation products, this investment may be offset by savings* realized in other areas. Examples include:

- Perpetual energy savings* can be realized as a result of substantially higher thermal and air sealing performance compared to other insulations. Discuss the long-term savings/return on investment with an experienced SPF supplier.
- HVAC sizing can be reduced providing cost savings without the loss of efficiency and comfort.¹⁰
- CcSPF will not distort framing and can reduce framing costs when properly installed.† CcSPF can achieve R- 23^{††} in a 2"x4" wall system reducing costs associated with a framing package, trim detailing and possible bracing requirements.
- Better moisture and condensation control translates to more durable homes, potentially reducing maintenance costs and the need for service call backs.
- Reduced drafts contribute to improved occupant comfort. CcSPF can add value by minimizing the potential need for future air sealing resulting from less effective and durable insulations.
- Structural strength can be increased since ccSPF adheres to exterior sheathing and studs. This can improve the home's durability and longevity.
- The use of ccSPF may qualify* for energy rebates and tax credits.



CcSPF's unique benefits for residential construction, including severe weather advantages, make it a preferred choice. Along with its exceptional performance characteristics, ccSPF continues to grow in popularity due to its ability to simplify

the air barrier design process, compatibility with other materials/systems and ease of application. Consequently, it is suggested that designers, builders and homeowners familiarize themselves with ccSPF insulation.

Visit Honeywell's "Choosing the right insulation" information sheet to compare ccSPF to other insulation options. Consult and work with experienced SPF contractors who are trained and certified in ccSPF installation.

Consider specifying ccSPF insulation that utilizes Honeywell blowing agent technology for your next residential building project. Also, discuss the latest in blowing agent technology with a Honeywell representative or visit www.honeywell.com for more information.



Sources:

1. Energy Star: http://www.energystar.gov/ia/business/challenge/learn_more/ResidentialHomeImprovement.pdf.
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4. DOE: Where Does My Money Go? Sourced Oct. 16, 2012 http://www.energystar.gov/index.cfm?c=products.pr_pie (2009).
5. NAHB Green Remodeling: http://www.nahb.org/fileUpload_details.aspx?contentID=86475&fromGSA=1 (2012).
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8. Energy Star: http://www.energystar.gov/index.cfm?c=home_sealing.hm_improvement_sealing.
9. Significant New Alternatives Policy (SNAP) program. EPA website. www.epa.gov/ozone/snap/foams/lists/comm.html.
10. Canadian Urethane Foam Contractors Association. www.cufca.com.

*Savings can vary. R-value is a term used to rate an insulation's ability to resist conductive heat transfer. The higher the R-value, the greater the insulating power. Ask your seller for a fact sheet for specific R-values.

†No insulation product should distort framing when properly installed. Always make sure your contractor is qualified for your job regardless of the type of insulation being used.

†† Honeywell Estimate - Figures may vary depending on markets and building practices.

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