

# The Case for Improved Building Performance

As a designer, builder or homeowner, you want to install durable materials designed to withstand nature's toughest test – severe weather. Each year, thousands of buildings are damaged or destroyed due to flooding, hail and high winds. The National Weather Service (NWS) estimates that damages due to flood loss over the past 30 years has averaged nearly \$8 billion.<sup>1</sup> In addition, hurricanes, tornadoes and typhoons also wreak havoc and can cause billions of dollars in damage. Even worse, they can lead to injuries and loss of life. No fewer than 800 tropical storms and hurricanes were recorded in the North Atlantic area in just the past 100 years, according to the National Oceanic and Atmospheric Administration (NOAA). Yet coastal construction remains among the most active nationally as population densities continue to grow along shorelines.

Catastrophic storms have prompted advancements in building practices, regulations/standards and materials intended to better withstand severe weather conditions. Increasingly, building systems are being specified that better protect the structure and its occupants during severe weather.

## How are buildings damaged during severe weather?

It is important to consider how buildings are typically damaged during severe weather. Not surprisingly, it has been found that roofs, followed by windows and doors, are the most susceptible to hurricane damage.<sup>2</sup> For roofs, the potential for failure is increased when:

- Fastening devices and sheet thicknesses are inadequate
- There are insufficient frequencies of fasteners in the known areas of greater wind suction

If the roof fails, the interior of the building is exposed to the elements resulting in significant damage and loss. In fact, water damage to a structure and its contents is often ten times more costly than damage to the roof itself.<sup>3</sup> The loss of even just a few windows during severe weather can quickly lead to roof failure as a result of internal and external pressure differentials.

Other areas of concern include damage resulting from hail storms, windborne debris or projectiles. Subsequently, a number of regions are adopting windborne-debris standards that require windows and doors to pass multiple impact and pressure loading tests. This, coupled with stronger roofing systems, can help reduce damage.

### How can closed-cell spray polyurethane foam (ccSPF) help?

Here are just some of the reasons ccSPF is serving an increasingly vital role in homes or commercial buildings being built or renovated in coastal areas and other regions prone to severe weather:

- CcSPF offers a long and positive performance record during severe weather.
- The U.S. Federal Emergency Management Agency (FEMA) considers ccSPF to be a flood-damage resistant construction and insulation material.<sup>4</sup> In fact, it is the only cavity insulation approved by FEMA as resistant to floodwater damage.
- CcSPF increases the ability of buildings and homes to withstand the effects of flooding, storm surge and high winds.
- It is relatively easy to build with and effective in terms of life-cycle costs.
- Additional ccSPF benefits include: improved energy efficiency, air sealing, moisture management, structural integrity, and long-term building protection.

### Advancements in Non-Ozone Depleting SPF Technology

CcSPF expands through the use of a high performance 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 windows. An example is Honeywell's Enovate® blowing agent (HFC 245fa) which is approved by the U.S. Environmental Protection Agency (EPA) under the Significant New Alternatives Policy<sup>5</sup> (SNAP) to replace ozone depleting substances. It is the preferred blowing agent in many ccSPF products worldwide. Continuing its advancement of blowing agent technology, Honeywell has introduced its new Solstice™ brand of low-global-warming blowing agents, refrigerants and aerosols. Solstice Liquid Blowing Agent is also EPA SNAP approved and can increase the thermal value of highly energy-efficient spray-applied insulation foams by an additional 5%. Discuss the latest foam blowing agent technology with Honeywell or your spray polyurethane foam supplier. To learn more, visit [www.honeywell-solsticelba.com](http://www.honeywell-solsticelba.com).



## 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.

## Why specify ccSPF for your building?

For buildings that may face severe weather, some additional advantages of installing ccSPF insulation include:

- Excellent wind uplift resistance (seamless, strong adhesion and self-flashing so ccSPF grips the building deck and roof)
- High structural (racking) strength (adheres to exterior sheathing and studs, adding rigidity)
- Outstanding water resistance (negligible water permeability and absorption)
- Strong hail resistance (performs above average compared to other roofing systems<sup>6</sup>)

In addition to benefits when facing severe weather, ccSPF offers many other day to day advantages. The American Chemistry Council's Center for the Polyurethanes Industry states:

- CcSPF resists heat transfer better than many other insulation materials. R-value is a term used to rate an insulation's ability to resist conductive heat transfer.<sup>7</sup> The higher the R-value, the greater the insulating power.
- By minimizing air infiltration, ccSPF assists in preventing moisture vapor from entering and escaping the building, which can reduce the load on heating and cooling systems. As a result, HVAC sizing can be reduced providing cost savings without the loss of efficiency and comfort.<sup>8</sup>

Not only can ccSPF help increase indoor comfort and potentially lower energy costs\*, you can be confident knowing you've installed insulation with a proven history of meeting severe weather demands. Talk to a certified SPF contractor and consider specifying ccSPF insulation for your next building project.

### Sources:

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3. Spray Polyurethane Foam Alliance (SPFA) technical paper: SPF-The Roofing System That Can Stand Up to High-Wind Disasters. SPFA Stock Number AY 124. [www.sprayfoam.org](http://www.sprayfoam.org).
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7. American Chemistry Council's Center for the Polyurethanes Industry website. [www.spraypolyurethane.org](http://www.spraypolyurethane.org).
8. Canadian Urethane Foam Contractors Association. [www.cufca.com](http://www.cufca.com).

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

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12-07-EBA  
November 2012 Printed in U.S.A.  
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