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# Losing their health and homes to spray polyurethane foam



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Design / Green Architecture  
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*This article is the first of a series examining the risks associated with spray polyurethane foam.*

When Keri Rimel's husband first came down with respiratory symptoms, he wasn't sure what caused them. He had a sore throat, congested sinuses, and runny eyes.

The day before, he has visited the construction site of their new home, where a contractor was installing spray polyurethane foam insulation. He and the architect were in the same room as the installer. "He didn't think anything of it," said Keri Rimel.

Their house in Austin, Texas was a new build. They had chosen Demilec's Sealection 500 spray foam as the only insulation and it filled every exterior wall cavity of the structure and the roof. Whenever he went back into the house, his symptoms would return.

**"As soon as I went into the house, the smell would be overwhelming and my throat would clog up."**

Keri experienced symptoms herself when she visited the house. "As soon as I went into the house, the smell would be overwhelming and my throat would clog up," she said. "I would get chest pain on the left side of my chest. That always happened."

Spray foam is often touted as a green building material because of its high insulation value and tight seal, which can make homes more energy efficient. The American Resource and Recovery Act of 2009 promoted spray foam as a source of green jobs that provides energy efficiency. According to the industry group Spray Foam Coalition, sales increased 29 percent from the first half of

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## IS SPRAY FOAM INSULATION SAFE?



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Yet as more homes and buildings are insulated with spray foam, a growing number of consumer advocates and green builders are concerned about the growing use of a product made from a number of toxic components. At the same time, homeowners around the U.S. are reporting serious health issues following the installation of spray foam or moving into a new home insulated with spray foam.

Spray foam insulation is produced during installation by mixing two liquid chemical components, referred to as "Side A" and "Side B." The liquid is then applied to the wall or ceiling with a spray gun, where it reacts and expands. Although there are toxicants in both Side A and Side B and installers are instructed to wear full body haz-mat suits, spray foam manufacturers say the final "cured" product is inert.

**"The products are safe, There are no issues. The products become inert. There's no long term effect and we have over 25 plus years of history in this marketplace."**

"We do standard [Volatile Organic Compound] analysis on all of the products that go to market," said Robert Naini, the chief operating officer of Demilec, one of the largest manufactures of spray foam. "It's lab testing done as part of our procedures." Volatile Organic Compounds (VOCs) are chemicals with negative health effects that off-gas from a variety of solid or liquid products. Naini said that all of their products meet several established guidelines for low-emissions products, including LEED standards, standards set by the California Department of Public Health, and GreenGuard certification.

"The products are safe," said Naini. "There's no issues. The products become inert. There's no long term effect and we have over 25 plus years of history in this marketplace."



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According to the Environmental Protection Agency and the Centers for Disease Control, the issue of off-gassing is less clear-cut. The EPA recently launched a webpage dedicated to reducing the risk of chemical exposure from spray foam, which states, "The potential for off-gassing of volatile chemicals from spray polyurethane foam is not fully understood and is an area where more research is needed."

Another issue is reentry time, or in other words, when is it safe to be around spray foam without protective garments after installation? The Centers for Disease Control is currently researching this question, but some manufacturers estimate as little as seven hours while others say as many as 72 hours. There are many factors that can impact curing rates, included the type of spray foam, the humidity, the thickness of the foam, the ambient temperature, the temperature of the chemicals and the technique of the installer.

**"The potential for off-gassing of volatile chemicals from spray polyurethane foam is not fully understood and is an area where more research is needed."**

Whatever the conditions might have been, it was unsafe for Keri Rimel's husband to be in the house at the time of installation without protective gear



out of the house," said Keri.

Rimel said the lingering chemical odor caused their building project to come to a halt. She and her husband delayed installing drywall to conduct air quality tests and attempted to ventilate their house. Eventually, they concluded that the foam had to be removed after testing indoor air quality tests found unacceptable levels of of VOCs, formaldehyde, acetaldehyde and hexanal. The written report from Argus Environmental, the company that conducted the testing, concluded that the Rimels should not occupy the home until the foam was removed.

But even after the spray foam had been removed, the chemical sensitization Keri and her husband suffer from made it impossible for them to stay in the house. "The fumes permeate everything," said Rimel. Even tiny amounts of chemicals can trigger their symptoms. After months of being unable to find a satisfactory solution, they sold the property.

### "This new source of exposure potentially puts a large population at risk for adverse health effects."

In the March 2012 edition of the Journal of Occupational and Environmental Medicine, Dr. Yuh-Chin T. Huang and Dr. Wayne Tsuang describe a case similar to the Rimels. A couple in their 30's returned to their home four hours after spray foam was installed in the attic. They almost immediately began experiencing difficult breathing, coughing, nausea, headaches and watery eyes.

The patients were diagnosed with asthma triggered by isocyanate, a chemical found in Side A and widely cited as the leading cause of occupational asthma. "The use of [spray polyurethane foam] in residential homes likely will continue to increase," they write. "This new source of exposure potentially puts a large population at risk for adverse health effects." The couple was eventually forced to leave their home after three months of trying to remediate both their symptoms and the lingering chemical odor.

Since publishing the article, Dr. Huang said he has been contacted by more than a dozen people who developed similar symptoms after being around spray foam. Although they call from around the country and he is not able to see them in person, he said most arrive at the same conclusion. "They cannot move back to their houses."

*[Next: Chemicals in spray polyurethane foam: How can something so toxic be considered green?](#)*

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