

# QUARTERLY TECHNICAL BULLETIN

from Progressive Foam Technologies, Inc.

**Q3 2009 – Volume 1, Issue 3**

(The purpose of this bulletin is to provide customers of Progressive Foam Technologies with critical and vital information about Insulated Siding in the areas of standards, testing, building codes, product performance and other relevant technical aspects which are providing additional support in the sale and installation of this product category. Please direct any questions or inquiries to your sales representative at Progressive Foam Technologies.)

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## **Insulated Siding Outperforms Fiber Cement in New Study**

The Vinyl Siding Institute (VSI) recently commissioned a study to evaluate the environmental performance of Insulated Siding. The study was conducted by Newport Ventures, a research and consulting firm with expertise in the housing industry. Two high-performance homes were built to comply with the rigorous goals of the New York State Energy Research and Development Authority's (NYSERDA) High Performance Residential Development Challenge, one in Saratoga Springs, NY, and one in Burnt Hills, NY. The Challenge was conceived to educate home builders on construction of cost effective, high performance homes designed to achieve 50 to 60 percent energy savings above that of typical homes built to New York's stringent energy code. In achieving this goal, both builders involved in the Challenge showed preferences for systems that offered both energy savings and affordability. Insulated Siding was specified by both builders as a system to help them achieve energy conservation and green building goals.

Researchers performed a side-by-side field test on the Burnt Hills home to compare Insulated Siding against James Hardie fiber cement. The test was conducted during the winter on a two story colonial built by Stewart Construction. Thermal imaging clearly indicated that there was less heat loss from the home to outdoors with the Insulated Siding compared to the fiber cement. The exterior surface temperature of the Insulated Siding section of the wall was considerably colder, indicating that there was more thermal bridging (heat loss) with the fiber cement product.

In the case of the Saratoga Springs home, the study found that environmental performance and visual appeal can go hand-in-hand through the use of Insulated Siding. Sixty eight percent of visitors to the home found the siding to be "very attractive" while 95 percent agreed that the visual appeal of the Insulated Siding was "better than average".

Overall, the study provides documentation that Insulated Siding can outperform exterior cladding alternatives like fiber cement on environmental issues while at the same time remaining aesthetically pleasing.

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## Expansion and Contraction Rates of Insulated Siding's Components

Over the past sixteen years, we at Progressive Foam Technologies, Inc. have worked very hard to overcome contractor skepticism towards Insulated Siding and the phenomenon of expansion and contraction. Our customer's concerns rest in the tendency of vinyl siding to expand in warmer temperatures and contract in cooler ones. Historically, anything that is attached to vinyl siding has complicated the expansion and contraction issue, with the result being a negative reputation of vinyl siding due to unattractive appearances and out-of-warranty applications. When we decided to laminate expanded polystyrene foam behind vinyl siding, customers were quick to point out that the expansion and contraction issue would ultimately defeat our product.

The technical term for what we call "expansion and contraction" is the "Coefficient of Linear Thermal Expansion (CLTE)". We have used accelerated weathering testing, field studies, and mathematical analysis to determine that the concern about expansion and contraction is unfounded. However, in order to further combat the skepticism, third party testing is being done to assess the expansion and contraction of the vinyl, adhesive, and EPS foam individually and also in combination with one another, as used in the field. The test method used to determine the CLTE of vinyl and foam separately and as a composite is ASTM D 696-03 *Standard Test Method for Coefficient of Linear Expansion of Plastics between -30°C and 30°C with a Vitreous Silica Dilatometer*.

This testing, which is currently being done on the product, has been referenced in Volume 1, Issue 1 of the Quarterly Technical Bulletin as part of the VSI Product Certification for Insulated Siding (see [Previous QTB's at www.fullback.com/professionals/tech\\_bulletin.php](http://www.fullback.com/professionals/tech_bulletin.php)). The VSI Product Certification program will take this performance characteristic into account and evaluate it based on the above standard.

In addition to this, a separate third party study has recently confirmed what years of field experience have demonstrated; that the similar rates of expansion and contraction for vinyl siding and foam insulation make them compatible materials as a composite when laminated. Not only do the vinyl and foam insulation expand and contract together, but the adhesive layer has an "elongation factor" of approximately 500%, which allows the glue to expand and contract as well, while maintaining its bond strength.



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## **Preventol<sup>®</sup> TM Protects Insulation from Termites**

Most people in the remodeling or building industry can tell you their own personal horror story about termites. Termites destroy wood in foundations, walls, and roofs of houses, and treating them and the damage they leave behind can be an expensive and difficult task. Most people aren't aware of the damage caused by termites until it is too late to eliminate them. In the foam insulation business, we at Progressive Foam Technologies are particularly aware of the habits of termites because the foam conceals their activities.

Since the introduction of the Fullback Thermal Support System, we have incorporated a termite inhibitor in our insulating foam for several reasons. We know that a termite will tunnel through ordinary foam insulation, such as fanfold, for shelter. The foam conceals the insects, leaving them undetected so they can have easy access to the wooden parts of the structure. The tunnels that termites leave behind damage the insulating value of the foam, and termite excretions compromise the strength of the foam.

As part of the continuous improvement and product upgrade process at Progressive Foam, in 2008 we shifted to what we believe is a far superior product in the war on termites, Preventol<sup>®</sup> TM. Preventol<sup>®</sup> TM Preservative Insecticide is not a repellent, but a systemic insecticide which protects the foam from termite damage. In testing, Preventol<sup>®</sup> TM outperformed all other similar or related products by a wide margin.

Of course, moving from a repellent to an insecticide raised some issues. Would the fact that this new product is an insecticide cause anxiety among homeowners? To answer that question, we can relate that the formulation of Preventol<sup>®</sup> TM is used at very low concentrations which have been shown to be safe for installers and homeowners. The active ingredient in Preventol<sup>®</sup> TM is also commonly used for crop protection as well as in collars and topical treatments for flea and tick control on pets.

We at Progressive Foam are convinced that we're using the best product available to keep termites from nesting in and tunneling through the foam insulation so they cannot cause damage to our customers' homes.



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## **Life Cycle Analysis of Insulated Siding**

The “green” movement has become extremely popular in everything from ecology to manufactured products, but how can “green” be quantified and explained to the customers and end users of Insulated Siding? If consumers are doing comparison shopping and looking for “green” products, how do they know which ones are actually “green” and which ones are not?

These are the questions that spurred us at Progressive Foam to begin a sustainability initiative process in the summer of 2008 by partnering with Sustainable Solutions Corporation. The plan was to complete a sustainability assessment around the manufacturing of the Insulated Siding product to see what could be improved in terms of our economic, social, and environmental performance. Opportunities to reduce natural gas and electricity usage, minimize waste, increase recycling, and improve water efficiencies were evaluated. All these opportunities would lead to a decreased negative impact on the environment and could be accomplished within the doors of our manufacturing plants. Several efforts were undertaken simultaneously to determine which would have the greatest and most lasting impact on reaching the above goals. Results began to show that improvements could be made in almost every area, resulting in an overall positive impact on the environment.

With this kind of encouraging news, we at Progressive Foam decided to pursue a life cycle analysis of Insulated Siding. A life cycle analysis, or LCA, takes every aspect of the product’s lifespan is taken into consideration, including: the environmental impacts of the extraction and processing of the raw material, manufacturing, transportation, distribution, use, reuse, and maintenance of the product as well as recycling, and final disposal of the product after it is used by the consumer. We began collecting data for the years 2007, 2008, and 2009 to create a life cycle inventory. Sustainable Solutions Corporation completed an assessment of Insulated Siding’s impact on the environment at each stage of the life cycle. This created a benchmark for us to compare our environmental impact to in the future.

At this point, the process of evaluation is ongoing. As such, we have not been able to publish the results of the Life Cycle Analysis. However, the results do indicate a positive trend from 2007 through the current date. Our goal is to publish the results of the LCA in 2010. At that point, we will be able to firmly represent the “greenness” of Insulated Siding for ourselves, our customers, and their customers as well. In the meantime, we continue to focus on improving efficiencies and recycling efforts and reducing our energy usage in order to decrease the carbon footprint of Insulated Siding.