

# NEXT GENERATION POLYISO ROOF INSULATION



By Jared Blum

*Polyisocyanurate insulation being installed on a roof deck. Photo courtesy of Firestone Building Products Co.*

In the 21st century, building owners, architects, specifiers, and physical plant managers look for high quality building products that are cost effective, energy efficient, and supportive of the environment. While the roofing marketplace has a number of quality thermal insulation products, recent developments have made polyisocyanurate (polyiso), already the nation's leading roof insulation product, an even more appropriate choice for long-term building performance. Using non-ozone depleting and non-global warming blowing agents in the manufacture of the insulation, polyiso manufacturers now utilize the most advanced scientific method to assess the long-term thermal resistance (LTTR) of their insulation products.

## Long Term Thermal Resistance (LTTR)

For architects and specifiers, providing R-values that accurately describe long-term thermal performance has been an issue of increasing importance. In the 1980s and 1990s, the polyiso industry used PIMA 101 (RIC/TIMA 281-1), a six-month conditioning procedure, to report R-value. This practice allowed for an "apples-to-apples" comparison of R-values from different manufacturers. During the past several years, polyisocyanurate rigid foam insulation manufacturers have participated in research projects in both the United States and Canada resulting in consensus laboratory methods that can be used to determine the design LTTRs of permeably-faced plastic insulating foams typically used as roof insulation.

In 2003, the members of PIMA, the Polyisocyanurate Insulation Manufacturers Association, transitioned to a new way to determine the thermal insulation efficiency of permeable-faced products. LTTR represents the most advanced scientific method to describe the long-term thermal resistance of foam insulation products using blowing agents such as hydrocarbons. LTTR has many advantages. It provides a technically supported, more descriptive measure of the long-term thermal resistance of polyiso insulation. It is an advanced test method, based on consensus standards in the United States and Canada. It applies to all closed-cell foam insulation with blowing agents other than air and provides a better understanding of the thermal performance of foam.

The chart above provides a representative overview of LTTR

POLYISO THICKNESS (inches)	LTTR R-VALUE
1	6.0
1.5	9.0
2	12.1
2.5	15.3
2.7	16.6
3	18.5
3.5	21.7
4	25.0

values, confirmed by third-party testing, for third generation/zero ozone depletion potential (ODP) polyiso foam insulation.

### Third Generation Blowing Agents:

On January 1st of this year, the polyiso industry began using new, zero ozone-depleting blowing agents in the manufacture of its foam insulation products. Blowing agents are one of the three basic components of polyiso insulation. The blowing agent is the ingredient that expands the foam and then remains contained in the closed cells, thereby enhancing the foam's thermal performance. This new generation of polyiso foam insulation is manufactured with hydrocarbon blowing agents instead of HCFC-141b.

The transition has been smooth, and product performance has continued to meet industry standards. In fact, PIMA manufacturing members have installed over one billion board feet of the new polyiso throughout North America over the past three years, and reported no difference in product performance. This is further supported by the extensive use of the new polyiso in Europe over the same time period, with similar results.

Polyiso foam insulation proves to be increasingly the product of choice for the commercial roofing industry, with an impressive 55% market share, according to a 2002 NRCA market survey. Its widespread use can be attributed to the fact that it is one of the most energy-efficient and cost-effective insulation materials used in roofing applications today, and to factors such as:

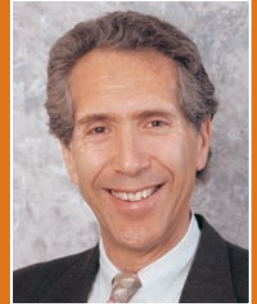
- The highest R-value per inch with long-term thermal performance validation;
- Compatibility with all types of roofing systems; and

- It meets both FM 4450 and UL 1256 for direct application over steel decks without a coverboard.

PIMA believes the dedication of its member manufacturers to innovation is a testament to the ingenuity and commitment of the industry in achieving the highest possible environmental performance for its products. The products' combination of zero ozone depletion and zero global warming potential, with their performance in reducing energy use and reducing CO<sub>2</sub> emissions, should solidify polyisos' place well into the 21st century. ■

## ABOUT THE AUTHOR

**Jared O. Blum** is the President of the Polyisocyanurate Insulation Manufacturers Association (PIMA), the Washington-based national trade association representing manufacturers of polyiso foam insulation. The Association is committed to working independently and with public and private organizations to educate Americans about the critical importance of national energy conservation. To learn more about polyiso and PIMA, visit PIMA's website at [www.pima.org](http://www.pima.org).



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