

# Multi-layering of Polyiso Roof Insulation

## About Polyiso Insulation

Polyiso is a rigid foam insulation used in over 70% of commercial roof construction, in commercial sidewall construction and in residential construction.

The Benefits of using Polyiso include:

- Quality Mark™ certified LTTR-values for permeable faced products
- Highest R-value per inch of thickness
- Excellent fire test performance
- Moisture resistant
- Dimensional stability
- Superior compressive strength
- Extensive building code approvals
- Cost effective
- Recycled content
- Zero ozone depletion potential
- Virtually no global warming potential
- Preferred insurance ratings
- Nationwide availability
- Thinner walls and roofs with shorter fasteners
- Compatible with most roofing systems

PIMA and polyiso products have received many environmental awards. These include an honorable mention in the Sustainable Buildings Industry Council's (SBIC) 2003 "Best Practice" Sustainability Awards Program and the U.S. EPA's Climate Protection Award for the association's leadership in promoting energy efficiency and climate protection. The EPA also awarded PIMA and its members the Stratospheric Ozone Protection Award for "leadership in CFC phase-out in polyiso insulation and in recognition of exceptional contributions to global environmental protection."



Multi-layering of polyiso roof insulation installed with staggered joints offers a number of advantages, including:

- Reduced thermal loss at insulation joints;
- Less thermal bridging;
- Helps prevent moisture from the inside of the building from condensing on the underside of the roofing membrane; and
- Minimizes potential for membrane splitting in Built Up Roofing (BUR) systems

The benefits of multiple layers of rigid board insulation of all types have been well known for years. Industry authorities, including National Roofing Contractors Association (NRCA), Oak Ridge National Laboratory (ORNL), Canadian Roofing Contractor Association (CRCA) and Roof Consultants Institute (RCI), have recognized these benefits; and contractors, designers and specifiers have followed this long-standing recommendation for the use of multiple insulation layers.

In a double or multiple layer configuration, the layer next to the deck must meet the polyiso roof insulation manufacturer's minimum thickness requirement for fire performance as designated by FM 4450 / UL 1256 / ULC-S126. The upper layer must meet the FM or UL/ULC applicable wind uplift classification.

## Single-Ply Systems

- Insulation Mechanically Fastened Through All Layers: When a coverboard is not used, PIMA **strongly recommends** the use of multiple layers. It is the responsibility of the designer to ensure that the cumulative R-value of multi-layer insulation corresponds to the R-value of the single layer insulation.
- The minimum thickness of either layer shall meet the requirements of the manufacturer's FM approvals and UL/ULC classifications.
- Joints of each layer must be offset (minimum 6" or as otherwise approved by the insulation manufacturer) to prevent continuous vertical joints through the full insulation thickness.

## Hot-Applied BUR and Modified Bituminous Roof Systems

- Cover boards are generally required in hot-applied BUR and modified bituminous roof systems and therefore create a multi-layered system. Multiple layering of the polyiso can add to the benefits of a multi-layered system in both fully mopped systems and systems that have

the first layer of insulation mechanically fastened with successive layers mopped or adhered.

- Joints of each layer must be offset (minimum 6" or as otherwise approved by the insulation manufacturer) to prevent continuous vertical joints through the full insulation thickness.

## In Summary

Although polyiso roof insulation manufacturers recognize that single-layer insulation systems continue to be specified and installed, they all agree that a multiple-layer system provides greater thermal efficiency.

## PIMA

For over 20 years, PIMA (Polyisocyanurate Insulation Manufacturers Association) has served as the unified voice of the rigid polyiso industry proactively advocating for safe, cost-effective, sustainable and energy efficient construction.

PIMA produces technical bulletins in an effort to address frequently asked questions about polyiso insulation. PIMA's technical bulletins are published to help expand the knowledge of specifiers and contractors and to build consensus on the performance characteristics of polyiso. Individual companies should be consulted for specifics about their respective products.

PIMA's membership consists of manufacturers of polyiso insulation and suppliers to the industry. Our members account for a majority of all of the polyiso produced in North America.

## SAFETY

Polyiso insulation, like wood and other organic building materials is combustible. Therefore, it should not be exposed to an ignition source of sufficient heat and intensity (e.g., flames, fire, sparks, etc.) during transit, storage or product application. Consult the product label and/or the PIMA members' Material Safety Data Sheets (MSDS) for specific safety instructions. In the United States, follow all regulations from OSHA, NFPA and local fire authorities; in Canada, follow all regulations from Health Canada Occupational Health and Safety Act (WHMIS) and local fire authorities.

**For more information on polyisocyanurate insulation, visit [www.polyiso.org](http://www.polyiso.org)**



### PIMA

7315 Wisconsin Avenue, Suite 400E, Bethesda, Maryland 20814  
Phone: 301.654.0000 • Fax: 301.951.8401  
[www.polyiso.org](http://www.polyiso.org) • [pima@pima.org](mailto:pima@pima.org)

