PIMA Technical Bulletin #112

Moisture Generated During Construction

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:

- *Low environmental impact*
- *Virtually no global warming potential*
- *Zero ozone depletion potential*
- *Cost effective, optimized energy performance*
- *Long service life*
- *Recyclable through reuse*
- *Recycled content (amount varies by product)*
- *Regional materials (nationwide production network)*
- *Meets new continuous insulation (ci) standards*
- *Quality Mark™ certified LTTR-values*
- *High R-value per inch of thickness*
- *Thinner walls and roofs with shorter fasteners*
- *Excellent fire test performance*
- *Extensive building code approvals*
- *Preferred insurance ratings*
- *Compatible with most roof and wall systems*
- *Moisture resistance*
- *Dimensional stability*
- *Compressive strength*

PIMA and polyiso products have received many environmental awards. These include an honorable mention in the Sustainable Buildings Industry Council's (SBIC) - "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."

POLYISO
The top performer.

Polyiso roof insulation is used in built-up (BUR), modified bitumen, metal, ballasted single-ply, mechanically attached single-ply, and adhered single-ply roofing systems. These roofing systems depend on proper installation for successful performance. Although all roofing systems can be compromised by construction generated moisture, loose laid and mechanically attached systems are more likely to be affected because as the flexible membrane flutters, moisture laden air from the interior may be drawn in to the system.[1]

Although not specifically a source of construction generated moisture, buildings under construction are susceptible to water/moisture intrusion from unfinished portions of the roof or adjacent components.

In *The Manual of Low Slope Roof Systems* by Griffin & Fricklas. (pp.112), information regarding construction generated moisture is presented:

- A 4" thick concrete floor slab placed in an enclosed building generates 1 ton of water per 1000 square feet of concrete.
- The use of heaters, such as "salamanders," to provide more comfortable working conditions or to help dry the construction also generates large quantities of moisture. For each 200-pound tank of propane burned, 30 gallons of water are produced.
- Oil-burning heaters produce 1 gallon of water for every 1 gallon of oil burned.
- Paint, plaster and other water based construction materials may also contribute to moisture accumulation in the roofing system.

Effects of moisture generated during construction on the roofing system:

- Condensed water vapor can collect in steel deck ribs causing corrosion and possible water intrusion into the building[2].
- Condensed moisture can promote the growth of micro-organisms that can weaken or destroy building components and create health issues[2].
- Liquid water entering the roof from rain or snow events can collect in the steel deck ribs and other levels of the system causing unseen damage.
- Moisture drawn into the roof system may affect the physical properties of roof insulation, including dimensional stability and thermal resistance.

1 Griffin & Fricklas. The Manual of Low Slope Roof Systems, pp.116
2 NRCA Roofing and Waterproofing Manual, 5th Edition, pp. 813

Good construction practices to help minimize moisture problems:

- Provide adequate ventilation of enclosed construction areas to minimize the accumulation of construction generated moisture.
- Since most moisture is transported by air, sources of air movement should be identified and blocked.
- A decision to use a vapor retarder should only be made by the roof designer because the inclusion of a vapor retarder may affect insulation fastening requirements, wind uplift ratings, or other approvals.
- Multi-layered roof insulation applications help restrict air flow and moisture transport into the roof system.
- During application of the roofing system, the completed portion should be protected from liquid water entry at the end of each day. Prior to installation of insulation the deck should be allowed to dry.
- When installing a roof covering on a concrete deck, ensure that the deck is dry enough for application of prime coat, hot asphalt or cold adhesive, and subsequent roof materials.

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 and marketers 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 (WMHIS) and local fire authorities.

For more information on polyisocyanurate insulation, visit www.polyiso.org

PIMA
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