

Moisture Generated During Construction

About Polyiso Insulation

Polyiso is a rigid foam insulation used in more than 70% of commercial roof construction and offers a continuous insulation solution for commercial and residential wall assemblies. As one of North America's most widely used and readily available building products, Polyiso is a cost-effective insulation option for reducing building energy use and improving the overall service-life of roofs and walls.

The benefits of using Polyiso include:

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

Moisture generated or entrapped during construction operations has the potential to compromise the performance and durability of even the most well-designed building enclosure systems of which roof assemblies are a critical component. Elevated moisture levels in buildings and building materials lead to conditions conducive to corrosion, further accumulation, and fungal growth. As with any building product or construction assembly, roof assembly systems rely on proper design and installation to ensure successful performance over the life of a building.

Rigid polyisocyanurate (polyiso) foam insulation board, installed above the roof deck, is used in a wide variety of common roof assembly systems including built-up roof (BUR), modified bitumen, metal, and ballasted, mechanically attached, and adhered membrane systems. While under construction, polyiso roof insulation boards are susceptible to wetting by moisture vapor and liquid water from exposure to unfinished portions of the roof, walls, or adjacent components, and from environmental exposures ranging from unconditioned interior environments to direct exposure. It is imperative that contractors adhere to the storage, handling, and installation instructions provided by the polyiso manufacturer.

Building materials and construction activities can release significant amounts of water; for example¹:

- A 4-in. thick concrete slab generates close to 1 ton of water per 1,000 square feet.
- The use of propane heaters, to provide more comfortable working conditions or to promote drying by elevating temperatures, 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.

Potential effects on the roofing system of moisture generated (and unmanaged) during construction include:

- Accumulation of water and water vapor within the roof assembly increasing the risk of water and moisture related issues such as promoting mold growth, decay, and corrosion.



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1. Griffin & Fricklas. *The Manual of Low Slope Roof Systems*, pp.116

- Liquid water entering the roof and collecting in the steel deck ribs, and other levels of the system, leading to corrosion and other unseen damage.
- Condensed water vapor in steel deck ribs leading to corrosion and possible water intrusion into the building.²
- Water drawn into the roof system compromising the physical properties, performance, or long-term durability of the roof system components.

Good design and construction practices to help minimize moisture problems:

- Adhere to the manufacturer's storage, handling, and installation instructions.
- Ensure continuity of waterproofing layers and air barriers.
- Ensure overall design, intended use, and project location (i.e., Climate Zone) considers drying potential.
- Provide adequate ventilation of enclosed construction areas to minimize the accumulation of moisture vapor.
- The use and location of vapor retarders or air-barrier membrane should be determined by the roof designer.
- Multi-layered roof insulation applications, with staggered joints, help restrict air flow and moisture transport into the roof system.
- Protect completed portions of installed roof systems from liquid water entry at the end of each day.
- Ensure roof decks are dry prior to installation of roof insulation.
- Ensure that concrete decks are dry enough for the installation of roof assembly components (i.e., primers, adhesives, insulation, and membranes).
- Monitor evolving industry research and best practices regarding moisture in building materials and construction.

2. NRCA Roofing and Waterproofing Manual, 5th Edition, pp. 813

ABOUT PIMA

Since 1987, PIMA has served as the voice of the North American rigid polyiso insulation industry. PIMA is a leading advocate for safe, cost-effective, sustainable, and energy-efficient construction. The Association is comprised of polyiso manufacturers and industry suppliers, and represents the public policy interests of its membership at the local, national, and international levels to advance high-performance building practices.

PIMA produces technical bulletins to address key topics related to polyiso insulation. These publications inform architects, specifiers, and contractors about the performance characteristics of polyiso insulation. Always consult individual manufacturers for product specific information, including product data sheets and installation instructions.

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

