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.

• 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.


**PIMA**

For more than 30 years, the Polyisocyanurate Insulation Manufacturers Association (PIMA) has served as the voice of the rigid polyiso industry, proactively advocating for safe, cost-effective, sustainable, and energy-efficient construction. Organized in 1987, PIMA is an association of polyiso manufacturers and industry suppliers. Polyiso is one of North America's most widely-used and cost-effective insulation products.

PIMA produces technical bulletins to address frequently asked questions about polyiso insulation. These publications update and inform architects, specifiers, and contractors about and build consensus on the performance characteristics of polyiso insulation. Individual companies can provide specific information about their respective polyiso products.