PIMA Technical Bulletin #501

High-Density Polyiso Cover Boards

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)
- QualityMark[CM] certified LTTR-values

POLYISO

Surround yourself with the best.

Polyiso Insulation: The Clear Winner

High-Density Polyiso (HDP) cover boards are an important component in roof systems providing a stable substrate for roofing membranes as well as suitable protection for underlying insulation.

HDP cover boards build on proven technology in a high-density form to deliver a high-performance alternative for the cover board market and provide the following advantages:

- Lightweight for installation efficiencies
- Excellent water resistance
- Easy to cut, no special tools required
- Virtually dust free
- Excellent impact resistance from foot traffic, storms and hail
- Mold resistance
- Long-term durability
- Increased additional R-value

Lightweight

HDP cover boards on average weigh 2/3 to 4/5 less when compared to comparable like-thicknesses of various gypsum products.

Long-term durability

HDP cover boards provide ideal long-term solutions for roofing membrane systems. HDP is governed by ASTM C1289 Type II, Class 4 products with three grades available.

HD Polyiso Cover Boards - ASTM C1289 Type II, Class 4

Physical Property	
Compressive Strength - psi, min	Grade 1: 80 Grade 2: 110 Grade 3: 140
Flexural Strength - psi, min	400
Break Load - lbf, min	20
Tensile Stregth - psf, min	2000
Water Absorption - % vol, max	4.0
Water Vapor Transmission - perm, max	1.5
Minimum Thermal Resistance @ 75 +/- 2°F	1/4" - 1.0 1/2" - 2.0

Benefit (carbon footprint)

HDP cover boards can be shipped with approximately three times more square feet per truckload - so fewer trucks are needed. This leads to fuel savings and reduced carbon emissions associated with transportation (assumes 48,000 pound maximum trailer capacity).

	HD Polyiso	1/4" Gypsum	1/2" Gypsum	5/8" Gypsum
Number of SQs per truck load (4 ft x 8 ft boards)	>700	<400	<250	<200
Number of trucks needed per 1,000 SQs	2	3	6	7
Additional trucks required per 1,000 SQs	—	1.5x	3x	3.5x

Benefit (product staging)

HDP cover boards allow for reduced crane time with less hoisting, loading and staging costs. HDP cover boards are easier to carry and maneuver around the roof. Pallets need not be broken or redistributed like gypsum products.

	HD Polyiso 4′ x 8′	1/4" Gypsum 4′ x 8′	1/2" Gypsum 4′ x 8′	5/8" Gypsum 4′ x 8′
# of Pallets or Bundles Per 1,000 SQs	70 to 104*	63	104	130
Hoisting — Fork Lift/Crane (Hours)	6 or less	17	28	35
Loading (Man Hours)	12 or less	33	56	69
Staging (Man Hours)	16 or less	63	83	104

* Varies among manufacturers

Benefit (structural design)

When considering the building structural design, HDP cover boards will contribute less dead load to the roof compared to gypsum boards. This is important since less dead loading can add up to big savings in structural costs.

	HD Polyiso	1/4" Gypsum	1/2" Gypsum	5/8" Gypsum
4 ft x 8 ft Board Weight - lbs	12	38-50	64-88	80-102
Weight per 1,000 SQs - thousands lbs	38	119-157	200-275	250-319
Additional Weight on Roof	—	3x - 4x	5x - 7x	6x - 8x

Increased additional R-value

HDP cover boards provide suitable protection to a roof system while contributing extra R-value. HDP cover boards can provide two to five times more R-value than gypsum-based products contributing to the overall system R-value.

	HD Polyiso	1/4" Gypsum	1/2" Gypsum
Board R-value	1.2 - 2.5	0.2 - 0.36	0.5 - 0.56

Excellent water resistance

The water absorption by volume of HDP cover boards is 4%. HDP cover boards will not rot, dissolve or support mold. They maintain their integrity under adverse weather conditions for the long-term enhancement of the roof system.

	HD Polyiso	1/4" Gypsum	1/2" Gypsum	5/8" Gypsum
Water Absorption - % volume	4%	9% - 12%	8% - 11%	8% - 10%
Water Absorption - lb per 4 ft x 8 ft board	1.7 - 3.3	3.8 - 5.0	6.4 - 8.8	8.0 - 10.2

Virtually dust free

HDP cover boards are a closed-cell high-density polyiso product that contribute less dust than gypsum products when cutting the boards. In addition, HDP cover boards do not cause itching, leading to overall worker satisfaction and improved productivity.

Mold resistance

HDP cover boards are resistant to the growth of mold when tested under the ASTM D3273 standard. This makes HDP cover boards highly suitable for applications prone to elevated moisture conditions.

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.

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

PIMA
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