

Polyiso Roof Insulation: Sustainable Buildings and LEED Credits

The LEED Rating System

In the early 1990's, the United States Green Building Council (USGBC) developed the Leadership in Energy and Environmental Design (LEED) rating system. This system is to be used as a model for green building performance and assessment. The LEED Rating System established basic requirements for key aspects of sustainable design, including Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, Integrative Processes, Innovation, and Regional Priorities. After certain prerequisite requirements are met, points are earned for implementation of the technical requirements of 44 different credits offering a total of 110 points. In order to achieve a Certified LEED Rating, a minimum of 40 points are required, while higher point levels are required for Silver, Gold, or Platinum LEED ratings.

LEED v4

Since its inception, the LEED Rating System has been periodically updated, and the current version is designed as LEED v4. According to the USGBC, the newest version of LEED is designed to be more flexible and improve the overall user experience. As an example, LEED v4 places greater focus on material ingredients and their effect on human health and the environment as well as an enhanced performance based approach to indoor environmental quality to ensure improved occupant comfort.

Sustainable Building Design and Green Architecture

Today, architects, contractors, specifiers and building owners are using the LEED program to promote the use of design and material that minimize the overall environmental impact of construction. While many have perceived that this type of building design requires a higher initial investment in the planning and construction of the building, the movement for sustainable or green buildings has quickly shifted from a niche construction market to mainstream building design. Building green can be a good long-term investment that does not have to cost significantly more than building with traditional materials.

Polyiso Insulation: An ideal product for LEED building design

Polyiso insulation is an ideal choice for LEED building design because it offers these advantages:

- **Highest Thermal Efficiency:** Polyiso is one of the most thermally efficient rigid foam insulations available in the marketplace, as determined using the LTTR testing method. LTTR is a measure of the thermal insulating performance of a panel over a 15 year, time-weighted R-Value. In addition, members of PIMA initiated a third party certification program called QualityMark™ to validate these thermal values. QualityMark is a voluntary program administered by FM Approvals, one of the nation's most recognized test organizations. In addition to saving energy, well-insulated buildings reduce fossil fuel use and associated air pollution.
- **Zero Ozone Depletion Potential:** All PIMA polyiso manufacturer members produce rigid foam board with third-generation, zero ozone-depleting blowing agents. All PIMA polyiso products are HCFC-free and CFC-free.
- **Negligible Global Warming Potential:** All PIMA polyiso manufacturing members produce rigid foam board with negligible global warming potential blowing agents. This quality is critical as the impact of climate change, or global warming, is acknowledged as a worldwide environmental concern.
- **Reuse/Recycled Content:** Polyiso insulation can be removed and reused through a network of national insulation recycling providers. In addition, virtually all polyiso insulation is manufactured using recycled material. The percentage of the recycled material by weight depends on the individual manufacturer and the thickness of the product. Many facers on polyiso products contain up to 100% recycled materials.

LEED Points Distribution: Potential Credits for Polyiso Use

Using polyiso insulation may gain credits under three of LEED's six rating categories: Energy and Atmosphere (EA), Materials and Resources (MR), and Indoor Environmental Quality (EQ). Here are some suggested opportunities to incorporate polyiso in a LEED building design, using the LEED Scorecard:

Energy & Atmosphere (EA)

- **Optimize Energy Performance:** As one of the most thermally efficient building insulations available, polyiso allows building designers to meet or exceed R-value goals while minimizing the thickness required for wall and roof systems.

Material and Resources (MR)

- **Building Life-Cycle Impact Reduction (Option 3: Building and Material Reuse):** Polyiso insulation may be reused or salvaged from off-site or on-site insulation recycling.
- **Building Life-Cycle Impact Reduction (Option 4: Whole-Building Life Cycle Assessment):** Life cycle assessment data for polyiso insulation is included in LEED recognized whole building life cycle assessment tools such as the Athena Impact Estimator.
- **Environmental Product Declarations (Option 1: EPD):** PIMA has published two industry-generic EPDs: One for polyiso roof and one for wall insulation. Both EPDs are third-party certified and meet the requirements of Type III EPDs.
- **Sourcing of Raw Materials (Option 1: Raw Material Source and Extraction Reporting):** Many manufacturers of polyiso roof and wall insulation publish and maintain third-party certified corporate sustainability reports (CSRs) that meet the requirements of Option 1. Contact individual manufacturer for detail.
- **Sourcing of Raw Materials (Option 2: Leadership Extraction Practices):** Polyiso manufacturers produce a variety of materials that may qualify for inclusion under responsible extraction criteria. Contact individual manufacturer for details.
 - **FSC-certified Wood Products:** Polyiso / Oriented Strand Board (OSB) composites may be manufactured using FSC-certified wood products.
 - **Materials Reuse:** Polyiso insulation may be reused or salvaged from off-site or onsite insulation recycling.
 - **Recycled Content:** Virtually all polyiso products contain post-consumer and preconsumer recycled content.
- **Construction and Demolition Waste Management (Option 1: Diversion):** Polyiso insulation can be removed and reused through a network of national insulation recycling providers.

- **Material Ingredients (Option 1: Material Ingredient Reporting):** Many manufacturers of polyiso roof and wall insulation publish and maintain manufacturer inventories and/or health product declarations (HPDs) that meet the requirements of Option 1. Contact individual manufacturer for details.

Indoor Environmental Quality (EQ)

- **Low-Emitting Materials (Option 1: Product Category Calculations):** Many manufacturers of polyiso roof and wall insulation publish and maintain third-party emission certifications that may be used to calculate the overall emittance of a project as required by Option 1. Contact individual manufacturer for details.
- **Low-Emitting Materials (Option 2: Budget Calculation Method):** Many manufacturers of polyiso roof and wall insulation publish and maintain third-party emission certifications that may be used to calculate the overall emittance of a project as required by Option 2. Contact individual manufacturer for details.
- **Thermal Comfort:** As one of the most thermally efficient building insulations available, polyiso allows building designers to meet or exceed thermal comfort goals while minimizing the thickness required for wall and roof systems.

PIMA: Committed to Energy Efficiency and the Environment

PIMA is the national trade organization that advances the use of polyiso insulation, one of the nation's most widely used and cost-effective insulation products. PIMA's membership consists of manufacturers and marketers of polyiso insulation, as well as suppliers to the industry. PIMA and its members have long been supporters of energy-efficiency, sustainability and the green building movement. As the most thermally efficient insulation available in the marketplace, polyiso directly contributes to our nation's effort to conserve energy, mitigate the effects of global warming, and reduce dependence on foreign energy sources.

As an association, PIMA is recognized as a major supporter of public policy that promotes energy efficiency. From support of tax incentives for energy-efficient commercial buildings to efforts aimed at updating a number of outdated state energy codes, PIMA continues to be a leader in the field of energy efficient construction.