

Residential Construction Details with the WarmWall^{cm} System

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:

- Quality MarkTM certified LTTR-values
- Highest R-value per inch of thickness
- Excellent fire test performance
- Moisture resistant
- Dimensional stability
- Superior compressive strength
- Extensive building code approvals
- Cost effective
- Recycled content
- Zero ozone depletion potential
- Virtually no global warming potential
- Preferred insurance ratings
- Nationwide availability
- Thinner walls and roofs with shorter fasteners
- Compatible with most roofing systems

PIMA and polyiso products have received many environmental awards. These include an honorable mention in the Sustainable Buildings Industry Council's (SBIC) 2003 "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."



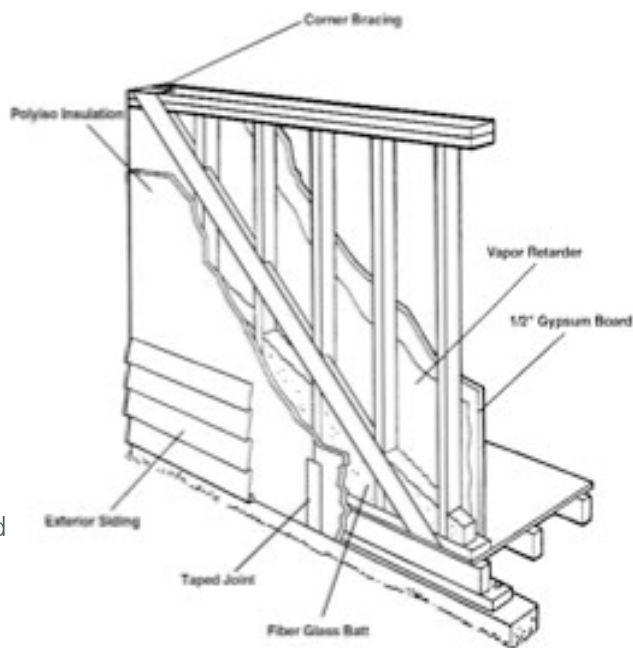
The Superior Sheathing System.

The Polyisocyanurate Insulation Manufacturers Association (PIMA) features WarmWall^{cm} - the Superior Sheathing System. WarmWall^{cm}

is an innovative building concept utilizing foil faced polyiso insulation sheathing to provide a complete envelope of insulation on the exterior of a home. The WarmWall^{cm} concept is extremely beneficial to both wood and steel framed construction, providing insulation over 100% of the exterior walls and increasing the overall thermal performance of a home.

What is the WarmWall^{cm} System?

- Proper corner bracing of framing;
- Insulates 100% of the exterior framed walls with foil faced polyiso insulation keeping energy loss to a minimum;¹
- The exterior joints of the polyiso insulation sheathing are taped to prevent air infiltration;
- Conventional glass fiber batt insulation is placed between the wood or steel framing;
- In heating or mixed climates, a continuous vapor retarder is applied on the interior side of the studs;
- Gypsum board, minimum 1/2" thick, is applied to the interior; and
- Exterior finish is applied in accordance with the manufacturer's recommended application instructions, over the polyiso insulation sheathing.



The WarmWall^{cm} System

¹ Savings can vary. Find out why in the insulation sellers fact sheet on R-value. Higher R-values mean greater insulating power.

Construction Details

- **Corner bracing**

Polyiso insulation sheathing is not a structural material. As such, wall systems with polyiso must have corner bracing to resist lateral loads resulting from wind forces on the home. Corner bracing is required by building codes; therefore, be sure to consult the local building code for specific wind load requirements since each home design presents different conditions. See the PIMA WarmWall^{cm} Technical Bulletin on Corner Bracing for more details.

Special construction techniques are needed for homes in seismic regions. Consult the local building code for specific seismic related construction requirements.

- **Foil faced polyiso insulation**

The polyiso insulation sheathing is applied over 100% of the opaque wall area. The application instructions provided by the manufacturer of the polyiso insulation should be followed to ensure proper attachment of the sheathing to the framing prior to attaching the exterior finish.

- **Taping the polyiso insulation board joints**

The joints of the polyiso sheathing should be taped using aluminum foil tape with an acrylic adhesive. (DO NOT USE DUCT TAPE because the adhesive degrades with time, especially at high temperatures.) Caulking at the top and bottom plates and around openings should be considered for improved performance.

- **Penetrations**

Penetrations for plumbing, electrical, air conditioning, and other openings, such as dryer vents, should be caulked or sealed with a high quality silicone caulking or polyurethane foam sealant to ensure long term performance.

- **Glass fiber batt cavity insulation**

Cavity insulation must be carefully installed to ensure it is not compressed and to avoid uninsulated areas around plumbing or electrical wiring in the wall cavity.

- **Vapor retarder**

A proper vapor retarder such as 4 or 6 mil polyethylene is installed over the inside face of the studs. Good construction practice dictates that penetrations at electrical outlets should be sealed with silicone caulking. Any tears or rips in the vapor retarder should be repaired with polypropylene tape with an acrylic adhesive. Sealing the vapor retarder at the top and bottom plates with either silicon caulking or tape is also a component of good construction practice. Consult local building codes for vapor retarder requirements.

- **Gypsum board interior finish**

The gypsum board should be installed and finished per the manufacturer's application instructions. Care must be taken by the installation crew so that damage to the vapor retarder does not occur.

- **Exterior finish**

The exterior finish is installed over the polyiso insulation sheathing. The choices include wood or vinyl siding, fiber cement siding, stucco, stone veneer or brick. Each exterior finish requires specific application details. During application of the exterior finish, follow the manufacturer's application instructions and exercise caution to prevent damage to the polyiso sheathing. In some wood siding applications, wood furring strips may be used over the polyiso sheathing before application of the wood siding.

NOTE: If structural sheathing (such as OSB or plywood) or foil faced cardboard is used over 100% of the opaque wall area, it is critical to consider the use of the WarmWall^{cm} system. The

1/2" or 7/16" OSB or plywood has an R-value of approximately 0.5. The use of 1 inch of polyiso insulation with an R-value of 7.2 delivers almost 15 times the insulation value of OSB or plywood and over 50 times the insulation value of foil faced cardboard. This increased R-value provided by polyiso sheathing insulates the framing, thereby greatly increasing the overall energy efficiency of the home.

The WarmWall^{cm} System Provides:

- **A wall system with a high R-value** - increasing the energy efficiency of the home and significantly reducing heat loss;
- **A reduction in air infiltration and exfiltration** - increasing the overall performance of the wall and reducing heat loss;
- **A reduction in the risk of water condensation/intrusion** - increasing thermal and structural performance and reducing builder call backs;
- **Insulation over the entire framing members** - reducing the loss of energy from the home;
- **Increased home builder confidence** - assurance that the builder is providing a quality product;
- **Increased home buyer/owner confidence** - assurance of a quality home with state-of-the-art energy efficient construction techniques.

Remember, normal good construction practices are essential in any building system. Always follow the manufacturers recommended application instructions.

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 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 (WHMIS) and local fire authorities.

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



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