



A New Insulation Solution

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Introduction

The application of insulation to building envelopes and structures has satisfied most requirements to date. However; recent changes to the local building codes, in response to global warming and greenhouse gas reduction, has made existing solutions inadequate to meet the new requirements. Designers and Builders are looking for solutions that easily integrate with traditional approaches comprised of existing insulation products meeting these new requirements.

The following paper outlines the use of Proloft^{®1}; a new product that provides alternatives to the current insulation issues that have not been readily addressed by existing technologies. Proloft[®] uses nanotechnology and is available in flexible sheets that offer the highest R-value per inch of thickness when compared to other existing insulating materials. In addition to being breathable, Proloft[®] is a hydrophobic matter that sheds water which is a benefit for those areas susceptible to mould.

This paper identifies insulation concepts that are well suited to the application of Proloft[®]. The following supports the superior benefits of Proloft[®] over current insulation solutions. Advanced Insolutions Inc. continues to bring innovative insulation solutions to the construction industry.

¹ Proloft[®] is a registered trademark of Advanced Insolutions Inc.

New Materials Deliver New Insulation Solutions

The quest for new products in the Energy marketplace has never been as strong as it is today. Existing products continue to evolve and new products are being developed to address the gaps in diverse market needs. Proloft[®] offers a solution for addressing thermal bridging areas that have previously been problematic for the builder or home owner.

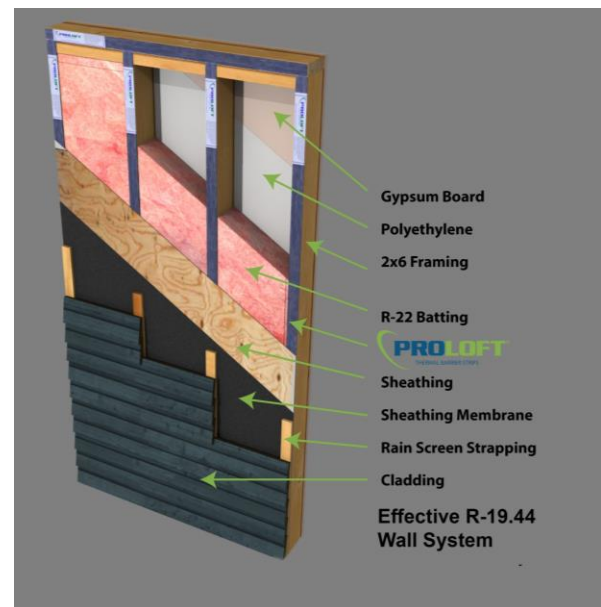


Figure 1: Typical Wall Assembly

The main use for Proloft[®] is in applications where current insulation solutions are restricted such as, areas with limited space or installations in compromising areas. Both of these applications are significant considerations in renovations of existing buildings or new construction, especially where the previous insulation solutions require a compromise of the profile of installation.

Thermal Breaks In Exterior Construction Assemblies

Thermal bridging within exterior construction assemblies is a known energy loss issue that has been identified for years with no effective solutions readily available. Code changes have compounded this problem with the requirement for professionals to directly address this area with limited product/support availability. The installation of Proloft® on the outer face of the framing members in a structure provides additional insulation in the heat loss path of wall and roof assemblies and exposed floor construction. Proloft® offers a simple solution to the long known problem with minimal impact on the profile and improves the assembly R-value.

Steel Stud Walls



Figure 1: Typical Steel Stud Wall Assembly

Exterior walls constructed with steel studs are especially susceptible to thermal bridging². Steel stud walls are most prevalent in commercial construction and are a good conductor of heat and effectively a short circuit.

“The R-value of 6 inch deep steel studs installed at 16 inch centers with cavity insulation of R-21 is reduced to R7.4, a value only 35% of the nominal.”³

The addition of even a single 10 mm layer of Proloft® will reduce the heat loss through a steel stud constructed exterior wall by up to 40% and is just as relevant for reducing energy loss in residential structures using steel studs.

Curtain Wall Insulation

Curtain wall assemblies are another assembly prone to thermal bridging with the need for targeted insulation. Proloft®, with its high R-value and aversion for water is an ideal insulating material to address those components of the curtain wall, that until now design professionals have not been able to insulate. Use of Proloft® in the mullion detail and the spandrel accents enables insulation solutions for those areas that previously could not be addressed.

² Insight – A Bridge Too Far, Joseph W. Lstiburek Ph.D., P.Eng. Fellow ASHRAE, August 2008.

³ Research Report - 0901, Thermal Metrics of Higher Performance Enclosure Walls: The Limitations of R-Value, John Straube, Building Science Corporation.

Limited Space Insulation Applications

The light weight and high R-value characteristics of Proloft® make it the ideal solution for adding insulation to existing walls without altering the profile of the existing structure.

Exterior walls on mobile or manufactured homes are ideal candidates for providing insulation without changing the profile or adding weight. Tight spaces within vaulted ceilings are another application that benefits from the low profile/high insulation properties of Proloft®.

Renovations Requiring Reduced Profile Insulation

The issue of adding insulation with a low profile during renovations is important. Under floor heating requires insulation when adding a heated floor to a bathroom or installing radiant floors where height and the impact on existing doors is a concern. For interior walls, on renovation projects, where insulation is desirable but the existing profile cannot accept current board insulation products; Proloft® is a simple and effective solution to the problem.

Special Applications Requiring Insulation

In most construction, there are always one or two instances where adding insulation brings energy savings and more comfort to the occupants of the building but the application of the insulation is impractical. Proloft® allows builders to pinpoint problem areas with little change to the existing profile.

Compressed Truss Heel

Within a truss system insulation is essential to create an effective building. The height of the

trusses, normally delineated by the heel height, is an area of concern as the height limits the maximum depth of insulation. The main area of concern in a truss system, is where the roof assembly meets the exterior wall as this area normally has the least room for insulation.

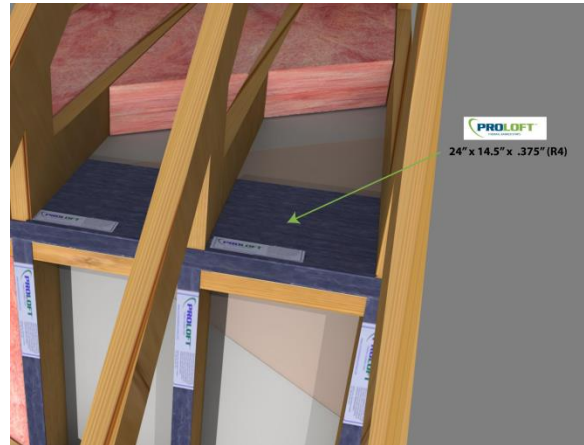


Figure 2: Insulation Compress Associated With Heel Height

Most building codes provide relief to the designer and builder in this area. For example; one metre from the exterior wall, due to the compressed space connected with the roof. Installing Proloft® where the roof assembly meets the exterior wall takes advantage of its higher R-value and the associated low profile can eliminate the cold spots normal found in these areas.

Steel Beam Insulation

Steel beams are good for structural issues but not good for insulating value. As a result, most steel beams are encapsulated in insulation to reduce the transfer of energy from the interior to the exterior where many of these beams are exposed. Proloft® permits a lower profile covering of the beam to reduce any energy loss thru the steel beam.

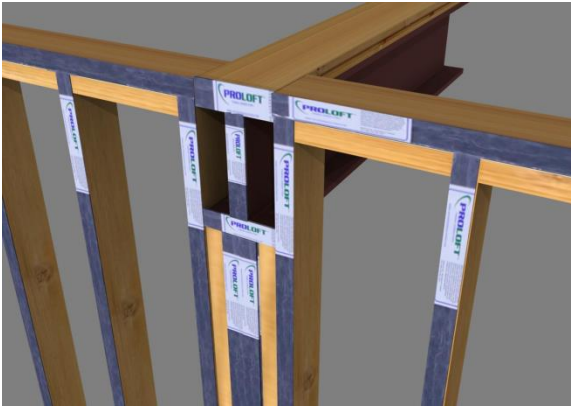


Figure 3: Steel Beam and support post insulation on exterior face

Insulated Lintels and Headers

The concern for the proper handling of the roof load so doors and windows do not have problems at different times of the year is normally addressed with thicker framing members, which reduces the available space for insulation, leading to another set of issues. Installing Proloft® in this reduced space can bring the overall wall system insulation level back up to that of the insulation between the framing members in the wall. This limits the energy loss thru the lintel and header.

Attic and Roof Hatch Coverings

Attic and roof hatches are infamous for being locations in the building envelop that are difficult to insulate. In many cases the hatches are uninsulated areas of the ceiling or the insulation needs to be adjusted after every access to the attic. Proloft®, with its low profile, can be integrated into the attic hatch minimizing the problems associated with insulation in this area.

High Temperature Applications

Proloft® in its standard form can be used in applications where the ambient temperature is kept below 200°C such as shielding walls from wood stoves and fireplaces. An additional benefit is the aversion to water condensation.

Conclusion

New materials are continually being developed addressing the existing insulation shortcomings in the industry today. Proloft® is one of these products as it addresses problems where high R-value insulation in a low profile is required. With its' high insulating value and hydrophobic properties, Proloft® makes the ideal insulation solution for problematic areas within the building envelop. Proloft® can be custom cut to fit specific needs from 1 ½" wide strips for thermal bridging applications or in blanket form for general insulation applications.

Contact your local Proloft® dealer for more information on this revolutionary product or visit www.advancedinsolutions.com.