

Exterior Insulation improves performance of steel framed structures

Technical Analysis

Recognizing that structures built with steel framing, cavity insulation and brick veneer exterior claddings were increasingly subject to moisture-related ailments, the Canadian Mortgage and Housing Corporation decided to try and determine the causes of these problems and further, how to mitigate them. Condensation was accumulating in the wall cavity, leading to deterioration of the studs, sheathing, brick ties, and insulation. Moisture in the brick was not uniformly distributed and was sufficient enough to affect the cladding adversely in freeze/thaw cycles. The wet insulation and sheathing fostered mold growth and reduced interior air quality. Walls designed to last 50 years were deteriorating in a much shorter period of time.



This study, entitled “Performance of a Brick Veneer/Steel Stud Wall System” examined the relationship between framing, insulation and cladding—and how these can be designed to perform better when used together in real world conditions.

It was theorized by many experts that thermal bridging at the studs in addition to heat lost due to air leakage compromised the thermal resistance of such wall assemblies, and the CMHC verified this by evaluating “perfect” test walls built in strict accordance with all Codes and standards, and observing similar results.

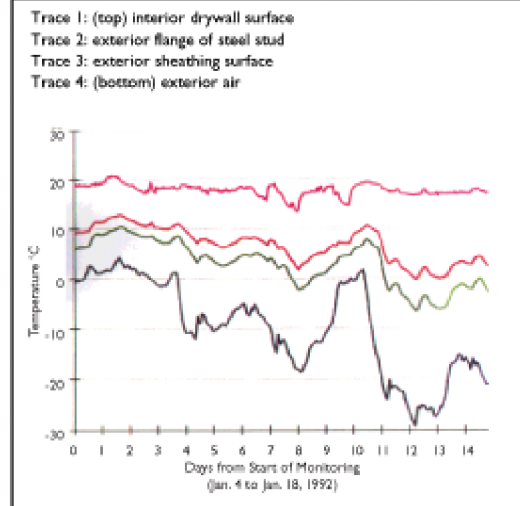
A key conclusion of their research is that by placing sufficient insulation on the exterior of the sheathing, the dew point temperature would not fall within the wall cavity—reducing thermal bridging and the condensation that occurred on the studs as a result! Dryvit Engineering services can provide a free water vapor transmission (WVT) analysis for any building design to confirm this.

Dryvit Outsulation Systems place insulation on the exterior of the wall, reducing air leakage and eliminating thermal bridging in steel framed construction. As steel framed construction continues to gain market share, the issues of thermal bridging, pressure equalization, condensation and moisture must be addressed when considering the building design—and Dryvit Outsulation systems offer cost effective, efficient design solutions to these challenges.

Dryvit Outsulation systems offer other meaningful benefits, such as:

- **Unmatched energy efficiency.** Dryvit Outsulation systems were found by the Oak Ridge National Laboratory to be at least 84% more energy efficient than other tested claddings.
- **Incredible design flexibility.** Dryvit offers a wide array of acrylic based finishes which accurately replicate many types of materials—stucco, cement, limestone, granite and even brick—allowing you to have the look you want and a more energy efficient exterior.
- **Lighter weight and faster to install.** Dryvit Outsulation systems weigh a fraction of heavier claddings—allowing for potential savings in footings and structural steel, as well as on construction time itself.

Figure 1: Temperature profile at stud



Dryvit systems are the perfect compliment to steel stud construction!