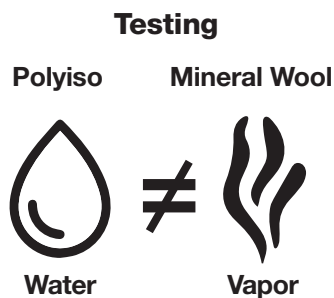


Polyiso “ci” vs Mineral Wool “ci”*

Polyiso outperformed when comparing water absorption, drying time and rewetting

A white paper called ‘Mineral Wool and Polyisocyanurate Insulation: A Comparative Study of Water Absorption, Drying, and Rewetting’ by M. Steven Doggett, Ph.D., can help design professionals decide what type of continuous insulation material is the best fit for their next project. In his white paper, Dr. Doggett, the Principal Scientist at Built Environments, Inc., examined and compared the water absorption, drying time, and rewetting effects of Polyiso wall insulation products and Mineral Wool wall insulation products (hereafter abbreviated as MWCI)* intended for use as exterior continuous insulation. Some of the highlights of the study are listed below. Check out the white paper for more details.



Testing:

While Polyiso wall insulation boards and MWCI products are intended for similar use within the building envelope, published test methods for water exposure differ greatly. Per published data sheets for MWCI, sorption potential is evaluated through ASTM C1104, which uses water vapor, and not liquid water, for wetting. Polyiso “ci” is evaluated using ASTM C209, which involves full immersion of the material being tested.

Testing with liquid water more accurately simulates real world conditions because exterior walls are subject to liquid water intrusion during installation, jobsite sequencing, and throughout the project’s lifespan. The true sorption properties and moisture holding capacity of MWCI are misunderstood and the consequences of sorption behavior, which include reduced R-value and increased moisture sorption ability, are often underestimated. The Built Environments white paper compares samples of both materials using the ASTM C209 methodology.

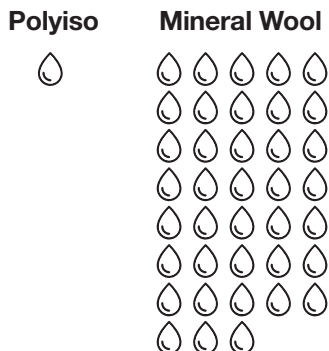
Evaluating Polyiso “ci” and MWCI using the same test method allows for more accurate comparison.

Consistency:

Performance and results differed significantly in testing of the MWCI products, even between individual panels of a given product from a manufacturer. While published information lists similar densities and binder types among products tested, variations in binders, additives, fiber orientation, and other physical properties exist between MWCI samples tested. This was experienced not only between products from different manufacturers, but also within products from the same manufacturer and package.

Significant differences and performances were observed between individual panels of MWCI.

Water Absorbed



Water Absorption:

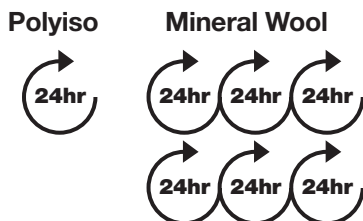
The ASTM C209 test method of a 2-hour full immersion followed by a 10-minute drain was used to represent a stringent wetting scenario. The samples were dried vertically as opposed to a 45° angle (as indicated in C209) in order to represent a more realistic drying scenario. In the initial testing the following results were seen:

- MWCI samples absorbed 8–38 times more water than foil-faced Polyiso “ci” samples.
- MWCI samples absorbed 4–19 times more water than coated glass-faced Polyiso “ci” samples.

Further analysis of the difference in water absorption between foil-faced and coated glass-faced Polyiso “ci” revealed that the additional holding capacity of coated glass-faced material is entirely due to the holding capacity of the porous facer, not the foam core. Drying times for both materials was virtually identical.

The study findings illustrate Polyiso “ci” showed significantly better resistance to water absorption than did MWCI products tested.

Drying Times

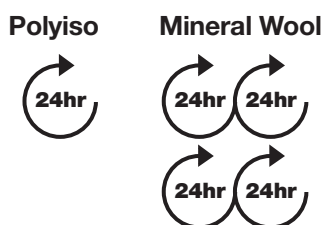


Drying Times:

The Polyiso “ci” samples were effectively dry within 24 hours while the MWCI samples took 2–6 days longer to reach 0.05% moisture content. Most of the water drainage from the mineral took place during the 10-minute drain, indicating that the post-drain weight does not necessarily come close to representing the actual moisture-holding capability of MWCI.

Polyiso “ci” samples were dry within 24 hours while MWCI samples took up to 6 days to dry.

Drying Times After Rewetting



Rewetting:

Once dried, the Polyiso “ci” and MWCI samples were re-wet under the same conditions (2-hour immersion followed by 10-minute drain). Rewetting of the MWCI material increased the moisture absorption of the samples by 132–190% and added up to 4 more days for drying to occur. Additionally, the physical appearance and fiber orientation of the MWCI were negatively affected.

Conversely, rewetting had no effect on Polyiso’s absorption rates, physical properties, or appearance.

In testing, Polyiso retained its properties after wetting and rewetting occurred while MWCI experienced significant changes under similar conditions.

**Contact Hunter Panels today
for more information.**

*Mineral Wool Continuous Insulation materials selected and used in testing described in the white paper are products intended for exterior facades and rainscreen applications. Reported densities for MWCI panels were 4.5 lbs/ft³ and 4.3 lbs/ft³ as per published manufacturer data sheets.

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