

STUDY SUMMARY

Moisture No. 106

In-Situ Water Absorption and R-value of XPS

The impact of moisture absorption and age on the performance of polystyrene foam insulations used for construction applications is an important design consideration. It is known that water absorption into extruded polystyrene (XPS) foam insulations will diminish their R-values. It is also known that XPS will lose R-value over time.

This Study Summary provides the in-situ R-value of 6 random XPS samples which were removed below grade from a building in Minnesota during renovation. The XPS is believed to be 33 years old.



The samples were tested following the industry standard for R-value, ASTM C518, at a mean temperature of 75F.

- The lowest R-value was 3.2, an incredible 36% below the claimed R-value of 5.0.
- Even the highest R-value was 4.4, a full 12% below the R-value claim of 5.0.
- The average R-value of the samples was 3.9, a significant 22% below the claimed R-value of 5.0.

Additional testing is in progress to determine moisture absorption, R-value loss due to moisture absorption, and R-value loss due to aging.



FOAM FACTS: XPS R-value.

