



Infrared technology application in building enclosures: applications, ASTM standards, and limitations

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Water infiltration, moisture accumulation, air leakage, and thermal bridging are among the most common and costly failures encountered in building envelope construction. Such conditions can negatively impact owners and occupants, accelerate degradation of materials, damage interior finishes, increase energy costs, and promote interior mold growth. Infrared thermography in building-enclosure-related work is used as a cost-effective, non-destructive evaluation tool for these types of conditions. Much of the appeal comes from its comparatively low introduction cost, ease of use, and production of images that are easily explicable to most people, from trained technicians to unfamiliar owners. Unfortunately, this ease of use and seemingly easy-to-interpret imagery also gives way to misuse and misinterpretation if the scan is not performed correctly.

This presentation will identify and explain three of the most commonly referenced ASTM standards involving infrared thermography:

- ASTM C1153: Standard Practice for Location of Wet Insulation in Roofing Systems Using Infrared Imaging
- ASTM C1060: Standard Practice for Thermographic Inspection of Insulation Installations in Envelope Cavities of Frame Buildings
- ASTM E1186: Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems.

Attendees will gain an understanding of the referenced ASTM standard tests, the purpose of the tests, overlooked challenges of building-enclosure-related infrared work, and methods that can be used to provide additional accuracy and precision. Specifically, we will use several roofing and building envelope case studies to illustrate the benefits and limitations of current infrared thermography practice relating to building enclosures. We



will also describe ongoing Simpson Gumpertz & Heger research to identify how different environmental factors affect infrared scans.

Keywords

ASTM test procedures, building enclosures, building materials, engineering quality detection, heat loss, infrared thermal imaging, roofing systems, wet insulation