

Thermographic Stucco Testing

The Color of Temperatures

Objective: Establish clarity about testing, including invasive vs. non-invasive approaches

Concerns about moisture intrusion problems in stucco homes have expanded beyond the well-documented issues encountered with EIFS (Exterior Insulation Finish Systems). Specifically, issues with conventional, hard-coat stucco applications recently have been raised in Pennsylvania and Minnesota. Homebuyers are requiring in-depth inspections of these properties, creating the need for clarity about test procedures.

One key word for early EIFS testing methods: invasive

In the early days of the EIFS controversy, inspectors were forced to use moisture meters that utilized invasive probes; in some cases, hundreds of small penetration holes were needed in order to complete a thorough moisture survey of a home's underlying structure.

The problem with “wet wall meters”

In order to minimize the number of probe points, the testing industry developed “wet wall meters,” a new technology capable of detecting moisture content through thin, synthetic stucco veneers and foam boards that comprise EIFS systems. When used properly, wet wall meters help to limit the number of invasive probes into a wall.

Unfortunately, wet wall meters are ineffective when testing conventional, hard coat stucco. Wet wall detectors utilize electrical impedance to detect moisture by transmitting electrical current into the wall and interpreting moisture content based on the effect that moisture has on the stability of the electrical current. The problem is that metal lath, the wire mesh which holds together all conventional hard coat stucco applications, creates a disturbance to the electrical current which routinely creates “false positive” readings.

Back to the future: conventional stucco requires invasive testing

Conventional, hard coat stucco applications, therefore, must be tested using the approach originally developed for use with EIFS applications. A significant number of invasive probes – around windows, doors, roof-to-wall junctions, utility access points, etc. – are used to evaluate areas of possible water intrusion. This invasive test procedure remains the most accurate way of assessing homes with conventional, hard coat stucco applications; however, this approach has reinvigorated the question about what can be done to facilitate a less invasive process.

The value (or not) of thermographic testing

More recently, there has been a lot of discussion regarding the use of thermographic, or infrared, testing as a non-invasive method for testing stucco homes. Thermographic cameras capture infrared images at test locations, and then calculate surface temperatures of an object based on the radiation it emits.

Thermographic testing: The bad and the ugly

As the nation's leading home inspection company, U.S. Inspect strives to deliver the best advice and most efficient approach to issues impacting our clients. We have spent considerable time and effort researching thermographic technology to understand its value, as well as challenges and potential limitations.

In concept, thermographic testing appears to be a reasonable approach to prevent invasive techniques; however, our research indicates otherwise:

- Ambient temps skew results. Because cameras “read” heat signatures of an object, there are inherent limitations regarding when equipment can be relied upon to capture accurate images. High and low ambient temperatures can bias results and complicate data interpretation; for example, some industry experts believe that dusk is the only appropriate time of day to capture thermographic images.
- Thermographic may not prevent invasive testing. Thermographic testing is not a panacea; like many other technologies, thermographic testing produces results that often are not definitive. Even after potential problem areas have been discovered, invasive probing is still necessary to verify the moisture content of the underlying structure.
- Cameras are complicated. Significant training and expertise are required in order to properly interpret the images; this requirement increases the cost of thermographic testing.
- Equipment is very expensive. Low resolution models are available from \$1,500 and more sophisticated high resolution models cost \$15,000 to \$25,000. Because equipment is expensive, testing is a high cost proposition.
- Very slow adoption. Given the aforementioned limitations, thermographic testing for evaluation of moisture intrusion in buildings is growing at a very slow pace.

Conclusion: Continue to use invasive probing, continue to study thermographic

US Inspect continues to recommend invasive probing as the most reliable and cost efficient method for evaluating i) conventional stucco and ii) EIFS homes.

US Inspect monitors thermographic industry developments. As more inspectors begin to utilize the technology and as more data becomes available, we will continue to reevaluate this technology. We will also evaluate opportunities to offer thermographic inspections in areas in which the technology can add value for our clients.

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Please contact marketing@usinspect.com if you have any questions or require assistance.