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Fluke's thermal imaging products can protect your building's envelope from moisture, mold and damage

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The presence of moisture in building envelopes, whether from leakage or condensation, can have serious consequences. For example, moisture in insulation reduces its insulating capability, causing heating and/or cooling losses and wasting energy. Moisture can also cause structural deterioration and foster the growth of mold, while a serious roof leak can damage or destroy a building's contents. Thermography, also known as thermal imaging, is well suited to identifying wet spots in building envelopes. As a diagnostic technique, thermography captures two-dimensional images of the apparent temperatures of equipment and structures. Thermal images can reveal anomalies in roofs and walls that can indicate the presence of moisture as buildings cool after having been under a thermal load.

What to look for?

Collecting thermal images is a good first step in analyzing a structure and identifying suspected problem areas. Unlike other moisture-detecting technologies, such as meters, thermography requires no physical contact with roofs, ceilings, walls or floors. In addition, you can check inaccessible areas and cover a large area in a single image. Regular building-envelope inspections are key to prolonging the lives of industrial, commercial and institutional buildings.

New construction and especially new roofs should be thoroughly inspected 6 to 9 months after construction, while the structure is still under warranty. That time lag allows the structure to experience the elements, hopefully a rainy season. Then, perform additional building-envelope scans every two to five years. Compare them to the original, baseline images to establish trends and determine remedies to any deterioration.

Experts estimate that preventive maintenance of this kind will double the life your facility's roof. Roof inspections should be conducted with the imager mounted on a tripod, so that the technician can concentrate on properly adjusting the camera to maximize the thermal resolution and analyzing the image. Fluke thermal imagers include IR-Fusion, a technology that fuses a visual, or visible light, image with an infrared image for better identification, analysis and image management. The dual images are accurately aligned at any distance heightening details, making it much easier to spot where further investigation is needed.

Follow-up actions

Before checking your building for moisture, be aware that this kind of inspection constitutes one of the most challenging uses for IR thermography. Buildings vary with respect to kind, use, construction techniques, building materials, size and so on.

Conducting effective thermal building surveys requires understanding construction methods and the thermal characteristics of building components, as well as how to account for changing thermal conditions within and around buildings. Then, following the IR inspection, determine where inside

heat sources are and whether they affected the exterior images. Finally, perform further analysis to confirm the findings. Infrared inspections provide the most cost effective means of ensuring that the roof is properly sealed, but the presence of a thermal anomaly does not indicate the presence of moisture in the roof. It is essential to follow up with core samples and other techniques. Reference ASTM C1153 Standard practice for location of wet insulation in roofing systems using infrared thermography. When you have accurately identified moisture in a building's envelope, targeted maintenance work can be performed.

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