How Temperature Differences Can Reveal Moisture Beneath A Commercial Roof



SLIDELL, LA, UNITED STATES, October 30, 2026 /EINPresswire.com/ -- Moisture trapped beneath the surface of a commercial roof can remain undetected for extended periods, even when the visible roofing membrane appears intact. Infrared thermography provides a method of examining temperature differences across roofing surfaces that may indicate the presence of moisture within the underlying roofing assembly.

Commercial roofing systems are exposed to rainfall, temperature fluctuations, ultraviolet radiation, and environmental conditions that can gradually affect their performance. Small openings around seams, flashing, penetrations, and other vulnerable areas may allow water to enter the roofing assembly without producing an immediately noticeable interior leak.

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>
> *Jules Albert III*

According to Jules Albert III, owner of Jaymar Roofing in Slidell, Louisiana, temperature differences can provide information about conditions that are not readily visible during a conventional roof inspection.

"Moisture beneath a commercial roof isn't always visible from the surface," Albert said. "Infrared inspections can identify temperature patterns that suggest certain areas are holding moisture, but those findings need to be evaluated carefully. A temperature difference alone doesn't automatically mean a roof is wet."

Understanding How Infrared Thermography Works

Infrared thermography uses specialized cameras to detect infrared radiation emitted by surfaces

and convert that information into thermal images.

These images display apparent surface temperature differences through variations in color or shading.

Unlike ordinary photography, which records visible light, infrared imaging provides information about the thermal characteristics of the surface being examined.

When roofing materials become wet, their thermal behavior may differ from that of surrounding dry materials.

Water can affect how roofing components absorb, retain, and release heat. Depending on the roofing system, moisture-containing areas may cool more slowly than adjacent dry areas after sunset.

Under suitable conditions, those differences can produce thermal patterns detectable through infrared imaging.

However, infrared cameras do not directly see through roofing materials or measure the amount of water beneath a membrane. They measure radiation from the visible surface, which may provide indirect evidence of underlying conditions.

Why Inspection Timing Matters

The timing of an infrared roof inspection can significantly influence the information collected.

During daylight hours, solar radiation warms exposed roofing surfaces. Roofing assemblies containing moisture may absorb and retain heat differently from surrounding dry materials.

After sunset, roof surfaces begin releasing accumulated heat.

In certain roofing systems, areas containing moisture may remain warmer than nearby dry sections because of differences in thermal mass and heat transfer.

This temperature contrast can make suspected moisture locations more apparent.

Albert explained that environmental conditions must be considered when interpreting thermal

images.

"The weather leading up to an inspection can affect what appears on the infrared camera," Albert said. "Sun exposure, wind, recent rainfall, and the type of roofing material all influence temperature patterns. The inspection needs to take those conditions into account before conclusions are made."

Cloud cover, surface shading, wind, and changing temperatures can reduce or alter thermal contrasts.

Consequently, inspections are generally scheduled during conditions suitable for the roofing assembly and the intended evaluation method.

Not Every Temperature Difference Indicates Moisture

One important limitation of infrared thermography is that temperature variations can occur for reasons unrelated to water intrusion.

Roofing materials with different thicknesses or compositions may heat and cool at different rates.

Insulation variations, previous repairs, roof penetrations, equipment shadows, surface contamination, and differences in membrane color can also produce thermal patterns.

Areas near HVAC equipment may experience temperature changes resulting from mechanical operation rather than moisture.

Similarly, roof sections exposed to different amounts of sunlight may display contrasting temperatures even when both areas are dry.

For these reasons, infrared findings should be interpreted alongside information about the roofing system, its construction, and existing environmental conditions.

A thermal image is a diagnostic tool rather than a definitive moisture test.

Confirming Suspected Moisture Locations

When infrared imaging identifies an area of concern, additional evaluation may be necessary to determine whether moisture is actually present.

Depending on the roofing assembly, confirmation methods may include moisture meters, electrical impedance testing, core samples, or other appropriate inspection procedures.

Core sampling allows direct examination of selected roofing components but requires careful planning and proper restoration of the sampled location.

Other testing methods may provide additional information without immediately opening the roof.

The appropriate approach depends on the roofing material, insulation type, roof construction, and inspection objectives.

Some roofing assemblies are not suitable for conventional infrared moisture surveys because their construction does not produce reliable thermal contrasts.

Why Trapped Moisture Matters

Moisture within a commercial roofing assembly can affect multiple components.

Wet insulation may experience reduced thermal resistance, potentially increasing the amount of heat transferred between the building interior and exterior.

Prolonged moisture exposure can also contribute to deterioration of certain insulation materials, adhesives, roof decks, and other components.

In roofing systems containing metal decking or fasteners, persistent moisture may contribute to corrosion under appropriate conditions.

Moisture can also complicate roof restoration projects.

Applying a coating or installing additional roofing materials over an assembly containing trapped moisture may leave underlying deterioration unaddressed.

Identifying affected areas before restoration or replacement planning can help determine which materials require further examination, repair, or removal.

Evaluating Moisture Patterns Across Large Roof Areas

Commercial roofs often cover thousands of square feet, making moisture assessment more complicated than examining a single visible leak.

Infrared imaging can help survey broad roof areas and document temperature patterns that warrant additional investigation.

These patterns may identify isolated areas of concern or indicate that suspected moisture extends across multiple roof sections.

The results can help guide the location of confirmatory testing and provide information for developing a roof maintenance or repair plan.

Albert noted that identifying the extent of suspected moisture can be as important as locating the initial area of concern.

"One wet area doesn't necessarily mean the entire roof has the same condition," Albert said. "The purpose of the evaluation is to understand where moisture may be present, determine what testing is needed, and establish which parts of the roofing assembly are affected."

Combining Thermal Imaging With Physical Inspection

Infrared thermography is generally most informative when combined with a physical roof inspection.

Inspectors may examine membrane seams, flashing, drains, rooftop equipment, penetrations, and previous repairs for conditions associated with water intrusion.

Drainage patterns and areas where water regularly accumulates can also provide useful information.

A roof may display thermal anomalies without having visible damage, while another roof may contain deteriorated flashing or open seams without producing a clear infrared indication.

Combining inspection methods helps place thermal findings in context.

Understanding What The Temperature Patterns Mean

Infrared roof inspections provide a way to investigate possible moisture conditions that may otherwise remain concealed beneath a commercial roofing surface.

Their usefulness depends on roofing materials, environmental conditions, inspection timing, and accurate interpretation.

Temperature differences can identify areas requiring attention, but additional testing is often necessary to distinguish trapped moisture from other causes of thermal variation.

For commercial property owners and building maintenance personnel, understanding these limitations is an important part of interpreting inspection results.

The objective is not simply to locate warmer or cooler areas of a roof. It is to determine whether those temperature differences indicate conditions affecting the roofing assembly and what

additional evaluation may be appropriate.

About Jaymar Roofing

Jaymar Roofing, located in Slidell, Louisiana, performs commercial roofing work involving roof inspections, maintenance, repairs, and restoration. The company works with commercial roofing systems and evaluates conditions affecting roof surfaces, drainage, and underlying roofing components.

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