



Thermal Imaging in Damp Diagnosis: What It Shows – and What It Doesn't

Thermal imaging has become an indispensable tool in building diagnostics, yet its capabilities and limitations are frequently misunderstood. This guide provides clarity on what thermal cameras actually measure, common interpretation pitfalls, and how to apply this technology within established British Standards frameworks for accurate damp diagnosis.

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What Thermal Imaging Measures

Thermal imaging cameras detect **infrared radiation emitted from surfaces**, converting this data into visual temperature maps. Understanding precisely what these devices measure is fundamental to accurate interpretation and avoiding diagnostic errors in damp investigation.



Surface Temperature Measurement

Thermal cameras record **surface temperatures only**, not internal moisture content. They detect temperature differentials as small as 0.1°C, creating detailed thermographic images that reveal thermal patterns across building elements.



Thermal Bridging Detection

Cold spots caused by **structural thermal bridges** appear clearly in thermal images. These occur where materials with higher thermal conductivity penetrate the insulation layer, creating distinctive temperature patterns at junctions and penetrations.



Insulation Gaps

Missing, compressed, or poorly installed insulation creates **temperature anomalies** that thermal imaging readily identifies. These gaps compromise thermal performance and can indicate areas requiring remedial attention during building surveys.



Air Leakage Paths

Uncontrolled air infiltration and exfiltration produces **characteristic thermal signatures**. When combined with pressurisation testing, thermal imaging pinpoints air leakage locations at construction joints, service penetrations, and defective seals.

📄 **BS EN 13187:1999** provides the standardised methodology for thermal imaging of buildings, specifying environmental conditions, equipment requirements, and reporting procedures that ensure consistent and reliable thermographic surveys.

Common Misinterpretations in Damp Diagnosis

The Critical Distinction

The most prevalent error in thermal imaging interpretation is **assuming cold surfaces indicate moisture presence**. Whilst evaporative cooling from damp materials does reduce surface temperature, numerous other factors produce identical thermal signatures, making moisture detection through thermography alone unreliable and potentially misleading.

"Thermal imaging identifies **temperature variations**, not moisture content. Always verify anomalies with **direct moisture measurement** before reaching diagnostic conclusions."

Thermal Anomalies Mistaken for Damp

- **Thermal bridging** through structural elements
- **External environmental factors** (wind exposure, shading)
- **Variations in surface emissivity** between materials
- **Heat capacity differences** in construction materials
- **Air movement patterns** creating localised cooling
- **Recent water ingress** that has since dried

Without complementary moisture measurement using **calibrated capacitance meters, gravimetric sampling, or relative humidity assessment**, thermal imaging cannot confirm moisture presence.

Temperature differentials require corroboration through direct moisture detection methods.

False Positives

Cold spots appearing as potential damp may simply indicate poor insulation, thermal bridging, or areas with higher thermal mass responding slowly to temperature changes.

False Negatives

Damp materials in thermal equilibrium with surroundings may show no temperature differential, particularly in stable indoor conditions or when moisture content is below evaporative thresholds.