



MEETS AND EXCEEDS

EVERY ASTM NON-DESTRUCTIVE TESTING STANDARD



Evaluation Area	ASTM Criteria	Roof MRI Compliance	Commentary
Calibration	Instruments must be calibrated using manufacturer specifications; calibration should be repeatable and validated.	Utilizes a 4-part calibration process including REL/WME readings, pin-prick validation, and analog matching.	Exceeds ASTM baseline. Introduces redundant analog confirmation not required by ASTM.
Measurement Grid	Spatial consistency encouraged; methods should allow reproducible location tagging.	10'x10' georeferenced grid overlay tied to satellite/aerial images and compass orientation.	Exceeds spatial documentation requirements of ASTM D6232.
Reporting	Should include location, technician, device used, calibration log, and test conditions.	Each Roof MRI Report includes: moisture classification map, technician ID, calibration photos, timestamp, compass orientation.	Fully compliant and extended. Offers digital outputs suitable for audit and legal review.
Technician Training	Recommended: documented training in methodology and interpretation of results.	Includes classroom training, rooftop training, AI-enhanced app, digital training modules, step-by-step SOPs, and certification model.	Exceeds standard with embedded digital training interface.
Environmental Controls	Must consider environmental effects (e.g., temperature, humidity) that affect measurement reliability.	Reports incorporate calibration before and during use; documentation includes environment notes when relevant.	Compliant, and introduces process resilience via in-field recalibration.
Non-Destructive Validation	Use of non-penetrating impedance tools accepted; destructive validation suggested for confirmation.	Impedance scanning validated by pin-prick spot tests (semi-destructive) and historical wet/dry insulation calibration samples.	ASTM-aligned approach with optional dual-mode validation.

MOISTURE SCANS THAT MAKES SENSE.



ROOF MRI VS. THERMOGRAPHY

Category	THERMOGRAPHY	ROOF MRI
Detection Principle	Detects temperature differences on the roof surface. Moisture is inferred indirectly from heat retention or cooling patterns.	Measures changes in electrical impedance within the insulation itself. Moisture is detected directly, not inferred.
Environmental Dependence	Highly dependent on time of day, roof cooling rate, solar loading, wind, cloud cover, dew, and surface temperature gradients. Small environmental shifts can distort or erase the signal.	Independent of sunlight, temperature, emissivity, or reflectivity. Can operate reliably after flash-off as long as surface moisture is not present.
Accuracy on Multi-Layer Systems	Struggles on roofs with coverboards, reflective membranes, double layers of insulation, or complex composites. Temperature changes do not always correspond to subsurface moisture volume.	Calibration to proven wet insulation normalizes construction differences. Signals penetrate facers, adhesives, and coverboards with predictable attenuation.
False Positives and False Negatives	Common sources of false readings include walls radiating heat, HVAC discharge, ponded areas cooling at different rates, shaded zones, and reflective membranes. Subsurface moisture may not produce a visible signature.	Moisture boundaries are confirmed by pinprick depth readings and electrical response. False calls are minimized through controlled calibration and repeated verification.
Depth Insight	Cannot determine moisture depth. Only surface temperature differences are visible.	Pinpricks measure insulation saturation at multiple depths, identifying top-loaded, mid-loaded, or bottom-loaded moisture.
Repeatability	Difficult to reproduce results unless environmental conditions are identical. Daytime versus nighttime scans often conflict. Changes to the surface of the roof can permanently impact the ability to get accurate readings.	Produces repeatable results due to calibrated reference points, floor establishment, and standardized documentation.
Operational Window	Requires a narrow operating window, typically at dusk or dawn when cooling occurs predictably.	Can be performed throughout the day once the roof has flashed off and surface moisture has evaporated.
Outcome for Building Owners	Useful for general screening but often requires confirmation testing. Interpretation can vary by operator and environmental conditions.	Provides a defensible moisture map with quantifiable gradients, depth confirmation, and documented calibration. Results can support scope definition, budgeting, and dispute resolution.

SAME EQUIPMENT. DIFFERENT RESULTS.



ROOF MRI VS. TRADITIONAL IMPEDANCE CALIBRATION TECHNIQUES

Category	Traditional Impedance Calibration (Dry-Reference Method)	Roof MRI Technique (Wet-Reference Diagnostic Method)
Calibration Point	Meter is <u>calibrated to dry material.</u>	Meter is <u>calibrated to proven wet insulation.</u>
Signal Behavior	Small moisture volumes overpower the meter.	Produces smooth, readable gradients that reflect moisture density and migration.
Discrimination Ability	Cannot distinguish damp vs wet vs saturated.	Discriminates moisture between wet, damp, trace and dry.
Repeatability	Results shift dramatically with each scan.	Repeatable results validated.
Depth Insight	No depth confirmation; readings are guesses without subsurface verification.	Pinpricks measure moisture at multiple depths.
Photos & Proof	No required calibration photos; no ability to demonstrate correct setup.	Requires floor photo, calibration-check photo, wet-zone photo, pinprick photo, and calibration verification photo.
Dielectric Noise	Does not calculate for/remove dielectric readings.	Removes dielectric readings that occur within different roofing materials.
Outcome on the Roof	High rate of false positives and false negatives; difficult to defend under scrutiny.	Stable, defensible moisture maps that define the size, density, and shape of saturated areas with clarity.