



Standard Practice for Location of Wet Insulation in Roofing Systems Using Infrared Imaging¹

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1. Scope

1.1 This practice applies to techniques that employ infrared imaging at night to determine the location of wet insulation in roofing systems that have insulation above the deck in contact with the waterproofing. This practice includes ground-based and aerial inspections. (**Warning**—Extreme caution shall be taken when accessing or walking on roof surfaces and when operating aircraft at low altitudes, especially at night.) (**Warning**—It is a good safety practice for at least two people to be present on the roof surface at all times when ground-based inspections are being conducted.)

1.2 This practice addresses criteria for infrared equipment such as minimum resolvable temperature difference, spectral range, instantaneous field of view, and field of view.

1.3 This practice addresses meteorological conditions under which infrared inspections shall be performed.

1.4 This practice addresses the effect of roof construction, material differences, and roof conditions on infrared inspections.

1.5 This practice addresses operating procedures, operator qualifications, and operating practices.

1.6 This practice also addresses verification of infrared data using invasive test methods.

1.7 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.8 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* Specific precautionary statements are given in 1.1.

¹ This practice is under the jurisdiction of ASTM Committee C16 on Thermal Insulation and is the direct responsibility of Subcommittee C16.30 on Thermal Measurement.

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2. Referenced Documents

2.1 ASTM Standards:²

C168 Terminology Relating to Thermal Insulation

D1079 Terminology Relating to Roofing and Waterproofing

E1149 Definitions of Terms Relating to Ndt by Infrared Thermography (Withdrawn 1991)³

E1213 Practice for Minimum Resolvable Temperature Difference for Thermal Imaging Systems

2.2 ANSI-ASHRAE Standard:

ANSI-ASHRAE Standard 101—Application of Infrared Sensing Devices to the Assessment of Building Heat Loss Characteristics⁴

2.3 ISO Standard:

ISO/DP 6781.3E—Thermal Insulation—Qualitative Detection of Thermal Irregularities in Building Envelopes—Infrared Method⁴

3. Terminology

3.1 Definitions:

3.1.1 *blackbody, n*—the ideal, perfect emitter and absorber of thermal radiation. It emits radiant energy at each wavelength at the maximum rate possible as a consequence of its temperature, and absorbs all incident radiance. (See Terminology C168.)

3.1.2 *core, n, n*—a small sample encompassing at least 13 cm² of the roof surface area taken by cutting through the roof membrane and insulation and removing the insulation to determine its composition, condition, and moisture content.

3.1.3 *detection, n*—the condition at which there is a consistent indication that a thermal difference is present on the surface of the roof. Detection of thermal anomalies can be accomplished when they are large enough and close enough to be within the spatial resolution capabilities of the imaging system; that is, when their width is at least two times the

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.