This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

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Standard Practice for Moisture Surveying of Roofing and Waterproofing Systems Using Nondestructive Electrical Impedance Scanners[1]

This standard is issued under the fixed designation D7954/D7954M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice applies to techniques that use nondestructive electrical impedance (EI) scanners to locate moisture and evaluate the comparative moisture content within insulated low-slope roofing and waterproofing systems.

1.2 This practice is applicable to roofing and waterproofing systems wherein insulation is placed above the deck and positioned underneath and in contact with electrically nonconductive single-ply or built-up roofing and waterproofing membranes and systems such as coal tar, asphalt, modified bitumen, thermoplastics, spray polyurethane foam, and similar electrically nonconductive membrane materials. This practice is also applicable to roofing and waterproofing systems without insulation placed above moisture absorbing decks such as wood, concrete, or gypsum, that are in contact with single-ply or built-up roofing and waterproofing membranes as described above.

1.3 This practice is applicable to roofing and waterproofing systems incorporating electrically nonconductive rigid board insulation made from materials such as organic fibers, perlite, cork, fiberglass, wood-fiber, polyisocyanurate, polystyrene, phenolic foam, composite boards, gypsum substrate boards, and other electrically nonconductive roofing and waterproofing systems such as spray-applied polyurethane foam.

1.4 This practice is not appropriate for all combinations of materials used in roofing and waterproofing systems.

1.4.1 Metal and other electrically conductive surface coverings and near-surface embedded metallic components are not suitable for surveying with impedance scanners because of the electrical conductivity of these materials.

1.4.2 This practice is not appropriate for use with black EPDM, any membranes containing black EPDM, or black EPDM coatings because black EPDM gives false positive readings.

1.4.3 Aluminum foil on top-faced insulation, roofing, or waterproofing membranes gives a false positive reading and is not suitable for surveying with impedance scanners; however, liquid-applied aluminum pigmented emulsified asphalt-based coatings shall not normally affect impedance scanner readings.

1.4.3.1 This practice is not appropriate for use with aluminium foil faced modified bitumen membranes, as the electrical conductivity of the aluminium foil surface can give false positive readings.

1.4.4 While their overburden remains in place, this practice is not appropriate for use with inverted roof membrane assemblies (IRMAs) or protected roof assemblies (PRMAs), which contain above the deck waterproof membrane and overburden that may include insulation, drainage components, pavers, aggregate, ballast, vegetation, or combinations thereof, because the impedance scanner will not differentiate between above and below the membrane moisture.

1.4.5 See A1.4 for some cautionary notes on roofing anomalies and limitations that affect the impedance test practice.

1.5 Moisture scanners using impedance-based technology are classified as EI scanners.

NOTE 1—The term capacitance is sometimes used when describing impedance scanners. Capacitance scanners are purely capacitive as they do not have a resistive component. Impedance scanners combine both capacitance and resistance for testing; thus, they are well suited to the measurement of different types of materials and constructions found in roofing and waterproofing systems as the combination of both components allows for a more versatile testing, calibration, and measurement arrangement.

1.6 This practice also addresses necessary verification of impedance data involving invasive test procedures using core samples.

1.7 This practice addresses two generally accepted scanning techniques for conducting moisture surveys using electrical impedance scanners:

1.7.1 *Technique A*—Continuous systematic scanning and recording (see 8.2), and

1.7.2 *Technique B*—Grid format scanning and recording (see 8.3).

1.8 This practice addresses some meteorological conditions and limitations for performing impedance inspections.

[1] This practice is under the jurisdiction of ASTM Committee D08 on Roofing and Waterproofing and is the direct responsibility of Subcommittee D08.20 on Roofing Membrane Systems.

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