



Designation: D7053/D7053M – 17 (Reapproved 2024)^{ε1}

Standard Guide for Determining and Evaluating Causes of Water Leakage of Low-Sloped Roofs¹

This standard is issued under the fixed designation D7053/D7053M; 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.

^{ε1} NOTE—Note 1 and footnotes 2, 3, and 4 were editorially updated in September 2024.

1. Scope

1.1 This guide describes methods for determining and evaluating causes of water leakage in low-sloped roofs. For this purpose, water penetration is considered leakage and therefore problematic; is causing or is likely to cause premature deterioration of the roof, building, or its contents; or is adversely affecting the performance of other components of the building. A roof is considered an assembly including the membrane, insulation, vapor retarder (if required), deck, and structural components.

1.1.1 This guide excludes moisture-related problems in roofs caused by condensation.

NOTE 1—*Condensation*—Moisture-related problems in roof systems may be caused by condensation of humid air originating from within the building and be incorrectly attributed to leakage from rain water. The protocol for an investigation of dampness due to condensation is complicated and requires special expertise, and is beyond the scope of this guide. For information regarding condensation problems as they relate to roofs, refer to ASTM MNL 18,² ASTM MNL 40,³ and ASHRAE Handbook—Fundamentals.⁴

1.2 Investigative techniques discussed in this guide may be intrusive, disruptive, or destructive. It is the responsibility of the investigator to establish the limitations of use, to anticipate and advise of the destructive nature of some procedures, and to plan for repairing and selective reconstruction as necessary.

1.3 This guide does not address steep-sloped roofs, standing or flat seam metal roofs, or architectural standing seam metal roofs.

¹ This guide 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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² Trechsel, H. R., ed., *Moisture Control in Buildings*, ASTM Manual Series, MNL 18, ASTM International.

³ Trechsel, H. R., ed., *Moisture Analysis and Condensation Control in Building Envelopes*, ASTM Manual Series, MNL 40, ASTM International.

⁴ *ASHRAE Handbook—Fundamentals*, available from American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE), 180 Technology Parkway NW, Peachtree Corners, GA 30092, <http://www.ashrae.org>.

1.4 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the standard.

1.5 *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.*

2. Referenced Documents

2.1 ASTM Standards:⁵

C1153 Practice for Location of Wet Insulation in Roofing Systems Using Infrared Imaging
D1079 Terminology Relating to Roofing and Waterproofing
D7186 Practice for Quality Assurance Observation of Roof Construction and Repair

3. Terminology

3.1 Refer to Terminology D1079.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *condensation*—the conversion of water vapor to liquid as the temperature drops or atmospheric pressure rises.

3.2.2 *water leakage*—the passage of (liquid) water through a material or system designed to prevent the passage of water.

4. Significance and Use

4.1 This guide is intended to provide building professionals with a methodology for evaluating water leakage through low-sloped roofs. It addresses the service history of a roof, the various components of a roof, and the interaction between these components and adjacent construction. It is not intended

⁵ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.