



AEROSPACE STANDARD

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Superseding AS6211

Ice Penetration Test Method for AMS1431 and AMS1435 Runway Deicing/Anti-Icing Products

RATIONALE

This document has been updated to include modifications in the method proposed in the working group and committee. This includes: 3.3.2, Adapted Test Support; 3.3.4, Ice Preparation; and optional 3.4.5.1, Measurement Using Photo Analysis. Few comments have been added to clarify the testing process and analysis. This document also incorporates some editorial changes.

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1. SCOPE

This document establishes a standardized test method designed to provide stakeholders—including runway deicing/anti-icing product manufacturers, users, regulators, and airport authorities—with a means of evaluating the *relative ice penetration capacity* of runway deicing and anti-icing products over time. The method measures ice penetration as a function of time, thereby enabling comparative assessments under controlled conditions. While commonly applied to runway treatments, these products may also be used on taxiways and other paved surfaces. The test is not intended to provide a direct measurement of the theoretical or extended ice penetration time of liquid or solid deicing/anti-icing products. Instead, it offers a practical and reproducible basis for performance evaluation, supporting operational decision-making and regulatory compliance.

1.1 Minimum Requirements

This method sets the minimum testing requirements for the determination of ice penetration capabilities of AMS1431 and AMS1435 runway deicing/anti-icing product in liquid and solid form as a function of time and temperature, under controlled laboratory conditions.

1.2 Hazardous Materials

This test may involve the use of hazardous materials, operations, and equipment. This standard does not address the safety problems associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1.3 Standard Units

The values stated in SI units are to be regarded as the standard.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 1-877-606-7323 (U.S. and Canada only) or 1-724-776-4970 (outside U.S. and Canada), www.sae.org.

AMS1431 Solid Runway Deicing/Anti-Icing Product

AMS1435 Liquid Runway Deicing/Anti-Icing Product

2.1.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9500, www.astm.org.

ASTM D1193 Standard Specification for Reagent Water

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Standard.

2.2.1 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9500, www.astm.org.

ASTM D1747 Standard Test Method for Refractive Index of Viscous Materials

2.2.2 Other Publications

Chappelow, C.C., McElroy, A.D., Blackburn, R.R., Darwin, D., de Noyelles, F.G, and Locke, C.E. (1992). *Handbook of test methods for evaluating chemical deicers* (Report No. SHRP-H-332). Strategic Highway Research Program, National Research Council.

3. SUMMARY OF TEST METHOD

3.1 Introduction

This test utilizes an adapted test support having 4.0 mm (0.16 inch) inside diameter small glass test tubes filled with ice. After equilibration to the desired test temperature, a known volume of dyed-liquid runway deicing/anti-icing product is discharged onto the ice surface and penetration commences (see Figure 1). At specified time intervals, the length of penetration is measured. Testing temperatures shall be within 0.5 °C (1 °F) of the stated values and tests shall be performed within a freezer or a cold chamber.

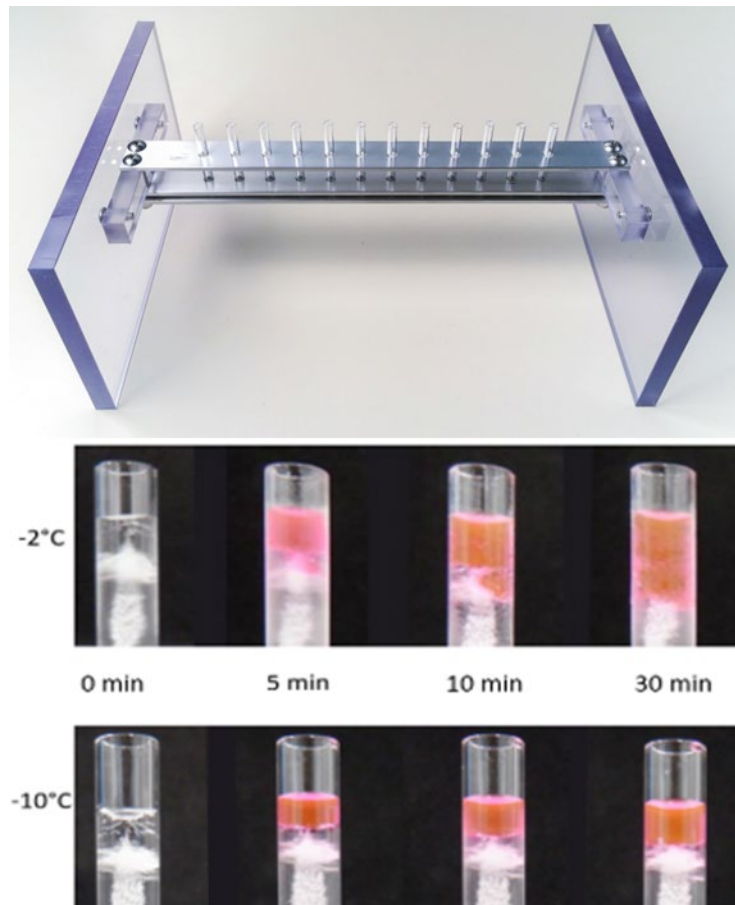


Figure 1 - Example of adapted test support with glass test tubes (top) and ice penetration test at two temperatures and at different times (bottom).