



AEROSPACE MATERIAL SPECIFICATION

AMS1424™**REV. T**Issued 1993-01
Revised 2025-04

Superseding AMS1424S

Fluid, Aircraft Deicing/Anti-Icing, SAE Type I

RATIONALE

This document has been revised to include clarifications of glycol concentrations in 1.1.2 and fluid qualification requirements in 1.5. The requirements for specific gravity and surface tension have been removed. Sections 3.2.4 related to refractive index, 4.2.3 related to fluid requalification requirements, and 4.4.2.1 related to recycled glycol have been revised per the recommendations of their respective working groups.

TABLE OF CONTENTS

1.	SCOPE.....	3
1.1	Form.....	3
1.1.1	Foundation and Category Specifications.....	3
1.1.2	Fluid Concentration.....	3
1.2	Application.....	3
1.3	Precautions.....	3
1.4	Safety - Hazardous Materials.....	4
1.5	Fluid Qualification.....	4
2.	APPLICABLE DOCUMENTS.....	4
2.1	SAE Publications.....	4
2.2	ANSI Accredited Publications.....	5
2.3	APHA Publications.....	5
2.4	ASTM Publications.....	5
2.5	Organization for Economic Cooperation and Development (OECD) Publications.....	6
2.6	U.S. Government Publications.....	6
3.	TECHNICAL REQUIREMENTS.....	6
3.1	Material.....	6
3.1.1	Definition of Glycol (Conventional and Non-Conventional) and Non-Glycol.....	6
3.1.2	Requirements.....	7
3.1.3	Non-Glycol Based Fluids.....	7
3.1.4	Appearance.....	7
3.1.5	Environmental Information.....	7
3.1.6	Trace Contaminants.....	8
3.2	Physical Properties.....	8
3.2.1	Flash Point.....	8
3.2.2	Repealed.....	8
3.2.3	pH.....	8
3.2.4	Refractive Index.....	8
3.2.5	Freezing Point.....	9
3.2.6	Repealed.....	9

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3.2.7	Viscosity	9
3.3	Fluid Stability	9
3.3.1	Storage Stability	9
3.3.2	Thermal Stability - Accelerated Aging for Concentrate and Ready-to-Use Fluids (to Simulate Long-Term Heated Storage Without Water Loss)	9
3.3.3	Hard Water Stability	10
3.3.4	Shear Stability	10
3.3.5	Foam Stability	10
3.4	Effect on Aircraft Materials	11
3.4.1	Sandwich Corrosion	11
3.4.2	Total Immersion Corrosion	11
3.4.3	Low-Embrittling Cadmium Plate	11
3.4.4	Stress-Corrosion Resistance	11
3.4.5	Hydrogen Embrittlement	11
3.4.6	Effect on Transparent Plastics	12
3.4.7	Effect on Painted Surfaces	12
3.4.8	Effect on Unpainted Surfaces	12
3.4.9	Runway Concrete Scaling Resistance	12
3.5	Performance Properties	12
3.5.1	Freezing Point	12
3.5.2	Anti-Icing Performance	12
3.5.3	Aerodynamic Acceptance Test	13
4.	QUALITY ASSURANCE PROVISIONS	14
4.1	Responsibility for Inspection	14
4.2	Classification of Tests	14
4.2.1	Lot Acceptance Tests	14
4.2.2	Initial Qualification Tests	14
4.2.3	Periodic Requalification Tests	14
4.3	Sampling and Testing	15
4.4	Approval	15
4.5	Reports	16
4.6	Resampling and Retesting	16
5.	PREPARATION FOR DELIVERY	16
5.1	Packaging and Identification	16
6.	ACKNOWLEDGMENT	16
7.	REJECTIONS	17
8.	NOTES	17
8.1	Revision Indicator	17
APPENDIX A	ENVIRONMENTAL REQUIREMENTS AND TEST METHODS	18
Table 1	Total immersion corrosion	11

1. SCOPE

1.1 Form

This foundation specification (AMS1424T) and its associated category specifications (AMS1424/1 and AMS1424/2) cover a deicing/anti-icing material in the form of a fluid.

1.1.1 Foundation and Category Specifications

This foundation specification establishes the requirements for all Type I deicing/anti-icing fluids, defines glycol (conventional and non-conventional) based and non-glycol based fluids, and contains additional properties and requirements that apply to both glycol (conventional and non-conventional) and non-glycol based products.

1.1.2 Fluid Concentration

Type I deicing/anti-icing fluid is supplied in different forms: concentrate or ready-to-use (dilute).

1.1.2.1 Concentrate

Fluid supplied as concentrate, typically containing 80 to 92% glycol, shall be diluted before use, as this concentration may exceed its acceptable aerodynamic limit. Consult the fluid manufacturer for the maximum usable concentration.

1.1.2.2 Ready-to-Use

Fluid supplied as ready-to-use does not require additional dilution before use. To achieve the desired lowest operational use temperature (LOUT), the concentration of the ready-to-use fluid may need to be adjusted. Consult the fluid manufacturer for guidance.

1.2 Application

The fluid is generally used heated and either diluted with water or as supplied for the removal of deposits of ice, snow, and frost on exterior aircraft surfaces prior to takeoff.

1.2.1 Consult the aircraft manufacturer's maintenance manual and service letters to determine any restrictions relating to the use of deicing/anti-icing fluids for type and model of aircraft being treated (refer to AS6285).

1.2.2 The manufacturer shall determine and report the LOUT for the recommended dilutions of their fluid(s).

1.2.2.1 The LOUT for an SAE Type I fluid is the lowest temperature at which the fluid has been tested and qualified in accordance with the appropriate aerodynamic acceptance tests (see 3.5.3) while maintaining the 18 °F (10 °C) freezing point buffer (refer to AS6285).

1.3 Precautions

1.3.1 The deicing/anti-icing formulation may be mildly toxic, and contact with human skin and eyes should be avoided. Prolonged exposure to concentrations of vapor and wind-borne mists should be avoided. Consult the manufacturer's Safety Data Sheet for further information.

1.3.2 A fluid meeting all other requirements of this specification may not meet the aerodynamic acceptance test criteria in the concentrated form. This fluid shall only be used diluted to the ratios that meet the aerodynamic acceptance test criteria.

1.3.3 The fluid should be used with extreme care when applied in the immediate vicinity of heaters or engine exhausts.

1.3.4 Reserved

1.3.5 Slippery conditions may exist on the ground or on equipment following deicing/anti-icing procedures.

- 1.3.6 A fluid meeting this specification is unique to the manufacturer and may be adversely affected by mixing with other aircraft deicing/anti-icing fluids. Adverse effects may also result from the mixing of glycol (conventional and non-conventional) based and non-glycol based aircraft deicing/anti-icing fluids and should be tested prior to use. Users of AMS1424/1 and AMS1424/2 Type I fluids shall ensure that the Type I fluid is compatible with the AMS1428 Type II, Type III, or Type IV fluid that is used in combination with the Type I fluid.
- 1.3.7 At the option of the user, a field spray test shall be performed to demonstrate and evaluate fluid application characteristics. The field spray test should be performed according to ARP6207, Section 4.
- 1.3.8 Deicing/anti-icing fluids should be compatible with carbon brake material. The industry standard test method for compatibility is AIR5567.

1.4 Safety - Hazardous Materials

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address any hazards that may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and processes and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

1.5 Fluid Qualification

- 1.5.1 For fluids qualified under previous versions of this specification, only tests for which the technical requirements have changed in subsequent versions from the original qualification need to be performed in order for the fluid to meet the requirements of the current version of this specification.

2. APPLICABLE DOCUMENTS

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications

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

AMS1424/1	Deicing/Anti-Icing Fluid, Aircraft, SAE Type I Glycol (Conventional and Nonconventional) Based
AMS1424/2	Deicing/Anti-Icing Fluid, Aircraft, SAE Type I Non-Glycol Based
AMS1428	Fluid, Aircraft Deicing/Anti-Icing, Non-Newtonian (Pseudoplastic), SAE Types II, III, and IV
AMS2470	Anodic Treatment of Aluminum Alloys, Chromic Acid Process
AMS2475	Protective Treatments, Magnesium Alloys
AMS4037	Aluminum Alloy, Sheet and Plate, 4.4Cu - 1.5Mg - 0.60Mn (2024; -T3 Flat Sheet, -T351 Plate), Solution Heat Treated
AMS4041	Aluminum Alloy, Sheet and Plate, Alclad, 4.4Cu - 1.5Mg - 0.60Mn (2024, -T3 Sheet/-T351 Plate with 1-1/2% Alclad), Solution Heat Treated, Cold Worked, and Naturally Aged
AMS4049	Aluminum Alloy, Sheet and Plate, Alclad, 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr (Alclad 7075; -T6 Sheet - T651 Plate), Solution and Precipitation Heat Treated
AMS4376	Plate, Magnesium Alloy, 3.0Al - 1.0Zn - 0.20Mn (AZ31B-H26), Cold Rolled and Partially Annealed

AMS4911	Titanium Alloy, Sheet, Strip, and Plate, 6Al - 4V, Annealed
AMS5045	Steel, Sheet and Strip, 0.25 Carbon, Maximum (SAE 1020), Hard Temper
AMS5886	Alloy, Corrosion and Heat-Resistant, Bars, Forgings, and Rings, 50Ni - 20Cr - 20Co - 5.8Mo - 2.2Ti - 0.45Al, Consumable Electrode or Vacuum Induction Melted, 2100 °F (1149 °C) Solution Heat Treated
AMS-P-83310	Plastic Sheet, Polycarbonate, Transparent
AIR5567	Test Method for Catalytic Carbon Brake Disk Oxidation
ARP6207	Qualifications Required for SAE Type I Aircraft Deicing/Anti-Icing Fluids
AS5900	Standard Test Method for Aerodynamic Acceptance of AMS1424 and AMS1428 Aircraft Deicing/Anti-Icing Fluids
AS5901	Water Spray and High Humidity Endurance Test Methods for AMS1424 and AMS1428 Aircraft Deicing/Anti-Icing Fluids
AS6285	Aircraft Ground Deicing/Anti-Icing Processes

2.2 ANSI Accredited Publications

Copies of these documents are available online at <https://webstore.ansi.org/>.

ANSI Z400.1/Z129.1-2010 Hazardous Workplace Chemicals - Hazard Evaluation and Safety Data Sheet and Precautionary Labeling Preparation

2.3 APHA Publications

Available from American Public Health Association, 800 I Street, NW, Washington, DC 20001, 202-777-2742 or www.apha.org.

Standard Methods for the Examination of Water and Wastewater

2.4 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM C672	Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals
ASTM D93	Flash Point by Pensky-Martens Closed Tester
ASTM D445	Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)
ASTM D1177	Freezing Point of Aqueous Engine Coolants
ASTM D1193	Reagent Water
ASTM D1218	Refractive Index and Refractive Dispersion of Hydrocarbon Liquids
ASTM D1568	Sampling and Chemical Analysis of Alkylbenzene Sulfonates
ASTM D3278	Flash Point of Liquids by Small Scale Closed-Cup Apparatus
ASTM D4177	Automatic Sampling of Petroleum and Petroleum Products

ASTM E70	pH of Aqueous Solutions with the Glass Electrode
ASTM F483	Total Immersion Corrosion Test for Aircraft Maintenance Chemicals
ASTM F484	Stress Cracking of Acrylic Plastics in Contact with Liquid or Semi-Liquid Compounds
ASTM F485	Effects of Cleaners on Unpainted Aircraft Surfaces
ASTM F502	Effects of Cleaning and Chemical Maintenance Materials on Painted Aircraft Surfaces
ASTM F519	Mechanical Hydrogen Embrittlement Testing of Plating Processes and Aircraft Maintenance Chemicals
ASTM F945	Stress-Corrosion of Titanium Alloys by Aircraft Engine Cleaning Materials
ASTM F1105	Preparing Aircraft Cleaning Compounds, Liquid Type, Solvent Based for Storage Stability Testing
ASTM F1110	Sandwich Corrosion Test
ASTM F1111	Corrosion of Low-Embrittling Cadmium Plate by Aircraft Maintenance Chemicals

2.5 Organization for Economic Cooperation and Development (OECD) Publications

Available from OECD, 2, rue André Pascal, Cedex 16, 75016 Paris, France, Tel: +33 1.45.24.82.00 or www.oecd.org.

OECD Environmental Data; Guidelines for Testing of Chemicals (Methods 202 and 203)

2.6 U.S. Government Publications

Copies of these documents are available online at <https://www.epa.gov/>.

EPA 40 CFR 136.3 Identification of Test Procedures

EPA 40 CFR 797.1300 Daphnid Acute Toxicity Test

EPA 40 CFR 797.1400 Fish Acute Toxicity Test

Copies of these documents are available online at <https://quicksearch.dla.mil>.

MIL-PRF-25690 Plastic, Sheets, and Formed Parts, Modified Acrylic Base, Monolithic, Crack Propagation Resistant

MIL-STD-870 Cadmium Plating, Low Embrittlement, Electrodeposited

3. TECHNICAL REQUIREMENTS

3.1 Material

Fluid composition shall be optional with the manufacturer; however, the product shall be based on freezing point depressants, with additives, such that the finished product shall meet all requirements of this specification. The fluid shall neither be thickened nor shall it contribute to mold creation or growth.

3.1.1 Definition of Glycol (Conventional and Non-Conventional) and Non-Glycol

For the purpose of classification for AMS1424 aircraft deicing/anti-icing fluid, freezing point depressants used to formulate AMS1424T Type I deicing/anti-icing fluids are classified as “glycol (conventional and non-conventional)” and “non-glycol.”