

# INTERNATIONAL STANDARD

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## **Aerospace — Aircraft de-icing/anti-icing Newtonian fluids, ISO type I**

*Aéronautique et espace — Liquides newtoniens ISO type I de  
dégivrage/antigivrage des aéronefs*



Reference number  
ISO 11075:1993(E)

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 11075 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Sub-Committee SC 9, *Air cargo and ground equipment*.

Annex A of this International Standard is for information only.

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# Aerospace — Aircraft de-icing/anti-icing Newtonian fluids, ISO type I

## 1 Scope

This International Standard establishes the requirements for Newtonian fluids used in the removal and prevention of ice, snow or frost on exterior surfaces of parked aircraft.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1518:1992, *Paints and varnishes — Scratch test*.

ISO 2719:1988, *Petroleum products and lubricants — Determination of flash point — Pensky-Martens closed cup method*.

ISO 3013:1974, *Aviation fuels — Determination of freezing point*.

ISO 3104:—<sup>1)</sup>, *Petroleum products — Transparent and opaque liquids — Determination of kinematic viscosity and calculation of dynamic viscosity*.

ISO 3675:1993, *Crude petroleum and liquid petroleum products — Laboratory determination of density or relative density — Hydrometer method*.

ISO 11078:1993<sup>2)</sup>, *Aerospace — Aircraft de-icing/anti-icing non-Newtonian fluids, ISO type II*.

OECD guidelines for testing of chemicals. Section 3 — *Degradation and Accumulation. Ready Biodegradability. 301 D Closed Bottle Test*.<sup>3)</sup>

AMS 2470H, *Anodic Treatment, Aluminium Alloys, Chromic Acid Process*.<sup>4)</sup>

AMS 2475D, *Protective Treatment, Magnesium Base Alloys*.

AMS 4037L, *Aluminium Alloy Sheet and Plate, 4.4Cu — 1.5Mg — 0.60Mn (2024-T3 Flat Sheet, -T351 Plate), Solution Heat Treated, UNS A92024*.

AMS 4041M, *Aluminium Alloy Sheet and Plate, Alclad, 4.4Cu — 1.5Mg — 0.6Mn, (Alclad 2024 and 1 — 1/2 % Alclad 2024, -T3 Flat Sheet; 1 — 1/2 % Alclad 2024-T351 Plate)*.

AMS 4049H, *Aluminium Alloy Sheet and Plate, Alclad, 5.6Zn — 2.5Mg — 1.6Cu — 0.23Cr (Alclad 7075-T6 Sheet, -T651 Plate), Solution and Precipitation Heat Treated*.

AMS 4376E, *Magnesium Alloy Plate, 3.0Al — 1.0Zn (AZ31B-H26), Cold Rolled and Partially Annealed*.

AMS 4911F, *Titanium Alloy Sheet, Strip, and Plate, 6Al — 4V, Annealed*.

AMS 6350H, *Steel Sheet, Strip and Plate, 0.95Cr — 0.20Mo (0.28-0.33C)*.

1) To be published. (Revision of ISO 3104:1976)

2) To be published.

3) This publication is available from the OECD, 2, rue André-Pascal, 75 775 Paris cedex 16, France.

4) AMS standards are available from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096, USA.

ASTM A 109M-90a, *Specification for Steel, Carbon, Cold-Rolled Strip [Metric]*.<sup>5)</sup>

ASTM D 1193-77, *Specification for Reagent Water*.

ASTM D 1331-89, *Test Methods for Surface and Interfacial Tension of Solutions of Surface-Active Agents*.

ASTM D 1747-89, *Test Method for Refractive Index of Viscous Materials*.

ASTM E 70-90, *Test Method for pH of Aqueous Solutions with the Glass Electrode*.

ASTM F 483-90, *Method for Total Immersion Corrosion Test for Aircraft Maintenance Chemicals*.

ASTM F 484-83, *Test Method for Stress Cracking of Acrylic Plastics in Contact with Liquid or Semi-Liquid Compounds*.

ASTM F 485-90, *Test Method for Effects of Cleaners on Unpainted Aircraft Surfaces*.

ASTM F 502-83, *Test Method for Effects of Cleaning and Chemical Maintenance Materials on Painted Aircraft Surfaces*.

ASTM F 519-77, *Method for Mechanical Hydrogen Embrittlement Testing of Plating Processes and Aircraft Maintenance Chemicals*.

ASTM F 945-85, *Test Method for Stress-Corrosion of Titanium Alloys by Aircraft Engine Cleaning Materials*.

ASTM F 1104-87, *Test Method for Preparing Aircraft Cleaning Compounds, Liquid Type, Water Base, for Storage Stability Testing*.

ASTM F 1110-90, *Test Method for Sandwich Corrosion Test*.

ASTM F 1111-88, *Test Method for Corrosion of Low Embrittling Cadmium Plate by Aircraft Maintenance Chemicals*.

BAC 5718, *Low Hydrogen Embrittlement Cadmium Plating*.<sup>6)</sup>

MIL-P-83310, *Plastic sheet, polycarbonate, transparent*.<sup>7)</sup>

DIN 65 321:1989, *Aerospace; Acrylic sheets, panes and moulded parts; Technical specification*.<sup>8)</sup>

WL 5.1416:1992, *Aerospace; acrylic material, cast, crosslinked, in 5.1415 material, biaxially stretched and crack propagation resistant*.<sup>8)</sup>

### 3 Definitions

For the purposes of this International Standard, the following definitions apply.

**3.1 Newtonian fluid:** Fluid whose viscosity is shear independent and time independent. The shear rate of a Newtonian fluid is directly proportional to the shear stress. A Newtonian fluid will begin to move immediately upon application of a stress; it has no yield stress which must be achieved before flow begins.

**3.2 lot:** All compound produced in a single production run from the same batches of raw materials under the same fixed conditions and presented for vendor's inspection at one time.

NOTE 1 The compound may be packaged in smaller quantities under the basic lot approval provided lot identification is maintained.

**3.3 preproduction test:** Test to determine conformance to all technical requirements of this International Standard.

**3.4 acceptance test:** Test performed to determine conformance to the requirements given in 4.2.6, 4.2.7 and 4.2.10.

**3.5 periodic test:** Test to determine conformance to the requirements given in 4.2.8.2 and 4.5.

### 4 Performance requirements

#### 4.1 Composition

The fluid shall contain a freezing-point depressant. The composition of the fluid shall otherwise be at the manufacturer's discretion. The fluid may contain additives, provided the requirements of this International Standard are met.

When glycols are used as the freezing-point depressant, the fluid shall include an inhibitor to minimize the potential fire hazard resulting from the interaction between aqueous glycol solutions and noble

5) ASTM standards are available from American Society of Testing and Materials, 1916 Race Street, Philadelphia, PA 19103, USA.

6) Available from Boeing Company.

7) US Government Publications are available from the Commanding Officer, Naval Publications and Forms Center, 5801 Tabot Avenue, Philadelphia, PA 19120, USA.

8) Available from DIN (Deutsches Institut für Normung, e.V.), Postfach, D-10772 Berlin, Germany.