INTERNATIONAL STANDARD

**ISO 11078**

Second edition
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# Aircraft — De-icing/anti-icing fluids — ISO types II, III and IV

*Aéronefs — Liquides de dégivrage/d'antigivrage — ISO types II, III et IV*



Reference number
ISO 11078:2007(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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 11078 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 9, *Air cargo and ground equipment*.

This second edition cancels and replaces the first edition (ISO 11078:1994), of which it constitutes a complete technical revision to endorse SAE AMS 1428, also supported by the Association of European Airlines (AEA).[1)]

1) This data requires frequent updating. ISO TC 20/SC 9 has agreed to delegating this task under its own guidance to the Association of European Airlines (AEA) and the Society of Automotive Engineers (SAE), which are organizations recognized as experts in the field of de-icing/anti-icing aircraft on the ground.

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# Introduction

The aim of this International Standard is to standardize the critical characteristics of non Newtonian fluids designated ISO types II, III and IV which are used for ground de-icing and anti-icing of airplanes, in order to ensure worldwide safety of civil transport airplanes under icing weather conditions.

In order to reduce duplication of reference documents as much as possible and to benefit from easier industry-approved updating that takes into account the continuously evolving state of the art and knowledge, this International Standard constitutes a *de facto* recognition of the AMS 1428 standard, published by SAE on the basis of a permanent joint Committee with the Association of European Airlines (AEA) and with endorsement from the Civil Aviation Authorities concerned.


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# Aircraft — De-icing/anti-icing fluids — ISO types II, III and IV

**CAUTION — The products that conform to this International Standard are unique to each manufacturer and may be adversely affected by mixing with other de-icing/anti-icing fluid.**

## 1 Scope

This International Standard defines the requirements for non Newtonian ISO types II, III and IV fluids used in the removal and prevention of ice, snow, or frost on exterior surfaces of main line and regional civil transport airplanes on the ground.

This International Standard is applicable to de-icing/anti-icing fluids for use on airplanes in general. However, the applicability may have limitations for particular airplane types. It is the airplane operator's responsibility to consult the aircraft operations manual, the aircraft maintenance manual and the service letters of the airplane manufacturer, to determine any limitations/restrictions relating to the use of de-icing/anti-icing fluids that conform to this International Standard for the type and model of airplane to be treated. See also ISO 11076.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 11076, *Aircraft — Ground-based de-icing/anti-icing methods with fluids*

AMS 1428, *Fluid, Aircraft Deicing / Anti-icing, Non-Newtonian, (Pseudo-plastic), Types II, III and IV* [2)]

International Civil Aviation Organization (ICAO) Doc. 9640-AN/940, *Manual of aircraft ground de-icing/anti-icing operations* [3)]

NOTE See also applicable national Civil Aviation regulations in the Bibliography.

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

**3.1**
**main line airplane**
civil passenger and/or freight transport airplane with a maximum ramp mass over 50 000 kg (110 000 lb)

2) AMS 1428 is published by and can be procured from: Society of Automotive Engineers (SAE), 400 Commonwealth Drive, Warrendale PA 15096-0001, U.S.A., or its web site at www.sae.org.

3) Available in English, French, Russian, Spanish languages from ICAO (International Civil Aviation Organization), 999 University Street, Montreal, Quebec H4Z 1M1, Canada, or its web site at www.icao.int, or E-mail address sales_unit@icao.int.

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**3.2**
**regional airplane**
civil passenger and/or freight transport airplane with a maximum ramp mass between 10 000 kg (22 000 lb) and 50 000 kg (110 000 lb)

**3.3**
**non Newtonian fluid**
fluid whose viscosity is shear and time dependent

NOTE ISO Types II, III and IV fluids, containing pseudo-plastic thickeners, provide protection against build up of frozen deposits. Pseudo-plastic behaviour is defined as a decrease of viscosity with an increase in shear rate.

## 4 Requirements

**4.1** The fluid shall be designated for international operations (see ISO 11076) as ISO type II, III or IV fluid, as applicable.

**4.2** The fluid shall conform to the requirements of Aerospace Material Specification AMS 1428.

NOTE AMS 1428 is prepared and continuously monitored by SAE Committee G-12, with participation of the Association of European Airlines (AEA) and ISO TC20/SC9/WG1 experts, to ensure that it reflects the latest state of the art and knowledge, and it is endorsed by the Civil Aviation Authorities of Canada, Europe, Japan and the U.S.A.

**4.3** The methods used for application and control of the fluid shall conform to ISO 11076 and the requirements of ICAO (doc. 9640-AN/940) and the competent Civil Aviation Authorities (see Bibliography).


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# Bibliography

[1] JAR-OPS 1.345, *Ice and other contaminants* [4)]

[2] ACJ 1.345, *Ice and other contaminants* [5)]

[3] 14 CFR Part 121, section 121.629, *Operation in icing conditions* [6)]

[4] AC 20-117, *Hazards Following Ground Deicing and Ground Operations in Conditions Conductive to Aircraft Icing* [5)]

[5] AC 120-60B, *Ground Deicing and Anti-icing Program* [5)]

[6] AC 135-16, *Ground Deicing & Anti-icing Training & Checking* [5)]

[7] TP 14052, *Guidelines for Aircraft Ground — Icing Operations* [7)]

[8] TP 10643, *When in Doubt... Small and Large Aircraft — Aircraft Critical Surface Contamination Training for Aircrew and Groundcrew* [6)]

[9] Association of European Airlines (AEA), *Recommendations for De-icing/Anti-icing of Aircraft on the Ground* [8)]

4) Joint Aviation Regulations, published by JAA (Joint Aviation Authorities).

5) Advisory Circular Joint, published by JAA (Joint Aviation Authorities).

6) The FAA (Federal Aviation Administration) Advisory Circulars constitute the transport aircraft operating recommendations of the U.S. government, and can be obtained from: US Government Printing Office, Mail Stop SSOP, Washington DC 20402-9328, U.S.A, FAA web site www.faa.gov.

7) The TP publications are published by the Transport Ministry of the Canadian government, and can be obtained from: Transport Canada, 330 Sparks St, Ottawa ON, Canada K1A0N5, web site www.tc.gc.ca.

8) Available from: AEA (Association of European Airlines), Avenue Louise 350, B-1050, Brussels, Belgium, web site www.aea.be.

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