INTERNATIONAL STANDARD

ISO 11076

Sixth edition
2020-01

Aircraft — Deicing/anti-icing methods on the ground

Aéronefs — Méthodes de dégivrage et d'anti-givrage au sol

Reference number
ISO 11076:2020(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

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

This sixth edition cancels and replaces the fifth edition (ISO 11076:2012), which has been technically revised. The main changes compared to the previous edition are as follows:

— deletion of reference to the *Recommendations for De-icing/Anti-icing of Aircraft on the Ground*, prepared by the former Association of European Airlines (AEA), which are not published anymore.

— addition of reference to Aerospace Standards AS6285, *Aircraft Ground Deicing/Anti-Icing Processes*, and AS6286, *Aircraft Ground Deicing/Anti-icing Training and Qualification Program*, prepared by the Society of Automotive Engineers (SAE) Committee G-12, *Aircraft Ground Deicing*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The aim of this document is to standardize the methods used for ground deicing and anti-icing of airplanes, in order to ensure worldwide safety of main line and regional civil transport airplanes under icing weather conditions.

In order to reduce, inasmuch as possible, duplication of reference documents and to benefit from easier industry approved updating to take into account the continuously evolving state of the art and knowledge, this document constitutes a recognition of the documents Aerospace Standards AS6285 and AS6286, prepared by Society of Automotive Engineers (SAE) Committee G-12, *Aircraft Ground Deicing*.

These documents are continuously monitored by this group of deicing experts, which includes the members of ISO/TC 20/SC 9/WG 1, regulators (FAA, TC, EASA), aircraft manufacturers, original equipment manufacturers (OEMs), fluid manufacturers, airline operators and the former Association of European Airlines Deicing group, and is regularly revised to take into account any additional operating experience and laboratory results.

The civil aviation requirements referred to in this document are those relating to operation of transport aircraft. They constitute the set of operation requirements internationally agreed in application of International Civil Aviation Organization (ICAO) Annex 6, *Operation of aircraft*, to the Convention on International Civil Aviation.

Throughout this document, the minimum essential criteria are identified by use of the key word "shall". Recommended criteria are identified by use of the key word “should” and, while not mandatory, are considered to be of primary importance in providing safe operation of aircraft in icing conditions. Deviation from recommended criteria should only occur after careful consideration and thorough service evaluation have shown alternate methods to provide an equivalent level of safety.

Aircraft — Deicing/anti-icing methods on the ground

1 Scope

This document establishes the minimum requirements for deicing/anti-icing methods on the ground of main line and regional airplanes, in accordance with ICAO, Document 9640-AN/940[1)] and the relevant civil aviation requirements, to facilitate the safe operation of main line and regional civil transport airplanes during icing conditions. This document does not specify requirements for specific aircraft model types.

Airlines' published manuals, procedures or methods supplement the information contained in this document.

Frost, ice or snow deposits, which can seriously affect the aerodynamic performance and/or controllability of an aircraft, are effectively removed by the application of the procedures specified in this document.

It is the airplane operator's responsibility to consult airplane manufacturer's aircraft operations manual, aircraft maintenance manual and service letters to determine any limitations/restrictions relating to the use of deicing/anti-icing methods meeting this document for the type and model of airplane to be treated.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 11075, *Aircraft — De-icing/anti-icing fluids — ISO type I*

ISO 11077, *Aircraft ground equipment — De-icers — Functional requirements*

ISO 11078, *Aircraft — De-icing/anti-icing fluids — ISO types II, III and IV*

DOCUMENT ICAO, 9640-AN/940[1)], Manual of aircraft ground de-icing/anti-icing operations

SAE AS6285[2)], *Aircraft Ground Deicing/Anti-Icing Processes*

SAE AS6286[2)], *Training and Qualification Program for Deicing/Anti-icing of Aircraft on the Ground*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

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

2) Available from the Society of Automotive Engineers (SAE), 400 Commonwealth Drive, Warrendale, PA 15096-0001, U.S.A., Tel: 877-606-7323 (inside U.S.A and Canada) or +1 724-776-4970 (outside U.S.A), web site: http://www.sae.org/.

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

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)

4 Methods requirements

4.1 Aircraft ground deicing/anti-icing methods shall comply with the present document and ICAO Document 9640-AN/940. It is presupposed that applicable international civil aviation requirements (CAR 602.11 and 622.11, EU-OPS 1.345 and ACJ 1.345, 14 CFR Part 121.629 and FAA AC 120-60, or equivalent) and any applicable local rules are followed.

4.2 A pilot shall not take off in an aircraft that has:

a) frost, snow, slush or ice present on any propeller, windscreen or power-plant installation or on airspeed, altimeter, rate of climb or flight-altitude instrument systems, or

b) snow, slush or ice adhering to the wings, stabilizers, control surfaces or fuselage, in gaps between the airframe and control surfaces or in gaps between control surfaces and control tabs, or any frost on the upper surfaces of wings, stabilizers or control surfaces.

For this reason, a contamination check of the aircraft surfaces shall be performed prior to departure.

4.3 The deicing/anti-icing and check methods and procedures used shall conform in all their aspects to the requirements of the latest issue of SAE AS6285.

4.4 The deicing and anti-icing fluids used shall meet the requirements of either ISO 11075 (ISO type I) or ISO 11078 (ISO types II, III and IV), as directed by SAE AS6285 appropriate to the prevailing weather conditions.

4.5 The deicing equipment used shall meet the appropriate requirements of ISO 11077.

5 Training requirements

5.1 Personnel participating in performance or control of aircraft ground deicing/anti-icing shall be appropriately trained and qualified, with recurrent training prior to each winter season.

5.2 Training contents shall conform to the requirements of SAE AS6286.

6 Quality control

Aircraft ground deicing and anti-icing operations shall be continuously monitored by each Operator within the framework of "Quality Control" and "Safety Management Systems". It is presupposed that the applicable international civil aviation requirements are met. Examples of these general requirements are:

— in the E.U.: EU-OPS 1.035

— in the U.S.A.: FAA AC 120-59