



AEROSPACE RECOMMENDED PRACTICE

ARP8701™

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Aircraft Deicing Vehicle - Towable Unit

RATIONALE

The rationale for the development of this document is to standardize the functional requirements for towable deicing vehicles/units used in regional/small airports for aircraft ground deicing/anti-icing operation.

INTRODUCTION

Deicing vehicles come in many different variations, and there are many different vehicles on the market. These vehicles range from small to large, from open basket to closed cabin, from mixed spray nozzles to extended-boom nozzles, from movable units to fixed units, either one- or two-person operated, etc. The vehicles have been developed for specific tasks in specific locations. Some airports only serve smaller aircraft and do not need the large-capacity vehicles, and vice versa.

The primary function of a deicing vehicle/unit is to apply deicing/anti-icing fluid from variable heights to the surfaces of aircraft while driving or being moved around the perimeter of the aircraft.

1. SCOPE

This SAE Aerospace Recommended Practice (ARP) covers the general technical requirements and provides specification guidance for towable deicing vehicles/units equipped with a deicing/anti-icing fluid spraying system. The unit shall be highly maneuverable for applying deicing/anti-icing fluid onto all exterior surfaces of commercial/commuter aircraft to be treated. The unit shall also be suitable for day and night operations and shall be reliable and capable of performing deicing/anti-icing treatments satisfactorily under various precipitation (e.g., moderate snow) and icy weather conditions (e.g., outside air temperatures down to -40 °C/-40 °F) in accordance with the recommendations and instructions specified in aircraft manufacturers' documents and the current version of AS6285.

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: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AS4828 Technical Manual Requirements for Ground Support Equipment

AS6285 Aircraft Ground Deicing/Anti-Icing Processes

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2.2 Related Publications

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

2.2.1 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 Fluid, Aircraft Deicing/Anti-Icing, SAE Type I
- AMS1428 Fluid, Aircraft Deicing/Anti-Icing, Non-Newtonian (Pseudoplastic), SAE Types II, III, and IV
- ARP1247 Aircraft Ground Support Equipment - General Requirements
- ARP1328 Aircraft Ground Support Equipment - Wind Stability Determination

2.2.2 CSA Group Publications

Copies of these documents are available online at <https://www.csagroup.org/store/>.

- CSA C225 Vehicle-Mounted Aerial Devices

2.2.3 European Standard (EN) Publications

Copies of these documents are available online at <https://www.en-standard.eu/>.

- EN 280 Mobile Elevating Work Platforms – Design Calculations – Stability Criteria – Construction – Safety – Examinations and Tests
- EN 1915-1 Aircraft Ground Support Equipment General Requirements, Part 1: Basic Safety Requirements
- EN 1915-2 Aircraft Ground Support Equipment General Requirements, Part 2: Stability and Strength Requirements, Calculations and Test Methods
- EN 1915-3 Aircraft Ground Support Equipment General Requirements, Part 3: Vibration
- EN 1915-4 Aircraft Ground Support Equipment General Requirements, Part 4: Sound
- EN 12312-6 Aircraft Ground Support Equipment Specific Requirements, Part 6: Deicers and Deicing/Anti-icing Equipment

2.2.4 IATA Publications

Available from International Air Transport Association, Publications Assistant, 800 Place Victoria, P.O. Box 113, Montreal, Quebec H4Z 1M1, Canada, Tel: 1-514-874-0202, www.iata.org.

- IATA AHM 975 Functional Specifications for an Aircraft Deicing/Anti-Icing Vehicle
- IATA AHM 977 Functional Specification for a Towed Deicing/Anti-Icing Unit

2.2.5 NFPA Publications

Available from National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471, Tel: 617-770-3000, www.nfpa.org.

- NFPA 70 National Fire Protection Association Electrical Code

3. TECHNICAL REQUIREMENTS

3.1 General Description

The primary function of the unit shall be to apply heated deicing fluid/water mixture and heated or unheated anti-icing fluid from its working basket or spraying platform/station to the surfaces of aircraft through fluid spraying system.

3.2 Basic Performance Features

- 3.2.1 The unit design must provide a safe and stable configuration for maneuvering around the aircraft with the working basket operating in any possible position while moving at speeds up to 5 km/h (3 mph). It shall be acceptable for use around terminal gate areas, airport service roads, and aircraft service ramps.
- 3.2.2 The unit shall be highly maneuverable for deicing/anti-icing all exterior surfaces of the aircraft to be treated.
- 3.2.3 The working basket shall be equipped with ample lighting to illuminate the control panels and spray area so that the unit may be suitable to operate during night operations.
- 3.2.4 The unit and all associated components/systems must be able to operate satisfactorily below freezing outside temperatures depending on the lowest operational use temperature of the glycol that is sprayed by its nozzle equipment.
- 3.2.5 The deicing fluid system shall be designed to withstand fluid temperatures down to -40 °C and up to 96 °C (-40 to 205 °F).
- 3.2.6 Underwing deicing shall be possible. A ground hose with reel and handheld spray nozzle shall be installed for underwing and landing gear deicing. A shutoff valve shall be installed immediately upstream of the hose.
- 3.2.7 Power distribution shall be so arranged that fluid spraying and boom positioning may be accomplished simultaneously with no detrimental effect upon any system.
- 3.2.8 The minimum size of the vehicle to tow the deicing unit should be specified by the equipment manufacturer.

3.3 Chassis Description

- 3.3.1 The unit shall be of minimum overall length, width, and height, consistent with stability requirements. Maximum length, width, and height, as permitted by local procedures, shall be agreed upon between purchaser and manufacturer.
- 3.3.2 The unit shall consist of a suitable towable chassis in accordance with applicable national safety standards. The chassis shall carry a fluid supply tank(s), a working basket/platform, a fluid pumping system, and an optional heater for applying heated deicing fluid to the surfaces of aircraft.
- 3.3.3 A recovery tow hook should be installed on the rear of the chassis structure.

3.4 Structure and Overall Dimensions

- 3.4.1 The unit's working basket, when extended or lifted, shall provide a basket floor-to-ground height as agreed upon between purchaser and manufacturer.
- 3.4.2 The working basket of the unit shall be constructed in accordance with applicable national safety standards. And it may be extendable out to either side of the unit.
- 3.4.3 If the basket is designed for two persons, the basket capacity shall be at least 204 kg (450 pounds) with a 122 x 61 cm (48 x 24 inch) floor area to accommodate two standing persons. It may also be designed for one person only, and the basket capacity shall in this case be at least 136 kg (300 pounds) with a 61 x 61 cm (24 x 24 inch) floor area to accommodate one standing person.