SAE Aerospace
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AEROSPACE INFORMATION REPORT

SAE AIR9968

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Field Viscosity Test of Thickened Aircraft Deicing/Anti-icing Fluids

FOREWORD

In freezing weather conditions, situations conductive to aircraft icing on the ground may be encountered. Methods of protection of aircraft surfaces with anti-icing fluids are described in ARP4737.

Aircraft operators and deicing companies perform field viscosity tests of thickened anti-icing fluids for quality control purposes. Since controls and audits are performed by various companies, a reference viscosity measurement method has been selected to perform exchange and interpretation of results. This AIR describes the selected test method.

1. SCOPE:

This SAE Aerospace Information Report (AIR) provides a description of a reference method for field viscosity tests of thickened (AMS 1428) anti-icing fluids.

1.1 Purpose:

To provide a reference method for field viscosity tests of thickened (AMS 1428) anti-icing fluids.

2. 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.

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2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 1428	Fluid, Aircraft Deicing/Anti-icing Fluid, Non-Newtonian (Pseudoplastic), SAE Types II, III, and IV
ARP4737	Aircraft Deicing/Anti-icing Methods
AS5485	Endurance Time Tests for Aircraft Deicing/Anti-icing Fluids, SAE Type II, III, and IV (proposed)

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 2196 Standard Test Methods for Rheological Properties of Non-Newtonian Materials by Rotational (Brookfield Type) Viscometer

3. TEST METHOD:

3.1 Instrument:

A Brookfield LV series viscometer shall be used.

NOTE: RV, HA or HB series Brookfield viscometers shall not be used for this test. It may be necessary to verify on the label on the back of the instrument if it is an LV series model, because normally the display on the front only indicates the sub model.

3.2 Basic Method:

The test method shall be in accordance with ASTM D 2196, Test Method A, however, the special requirements as listed in 3.3 shall take precedence.

3.3 Special Requirements:

3.3.1 The fluid may be degraded by shearing; therefore, the fluid processing shall avoid excessive shaking and inappropriate methods to fill the sample chamber.

3.3.2 The fluid to be tested shall be substantially free of air bubbles.

3.3.3 The viscosity reading shall be taken at a fluid temperature of 20 °C ± 1 °C.

3.3.4 Spindle Selection:

3.3.4.1 For viscosities below 10,000 mPa·s, Brookfield spindle LV1 shall be used. The guard leg shall be attached to the viscometer. The sample container shall be round and big enough for immersion of the spindle and guard leg.