



AEROSPACE STANDARD

AS5900™**REV. E**Issued 2003-02
Revised 2021-08

Superseding AS5900D

(R) Standard Test Method for Aerodynamic Acceptance of
AMS1424 and AMS1428 Aircraft Deicing/Anti-Icing Fluids

RATIONALE

- Addition of a middle speed ramp.
- An appendix explaining rationale behind selection of the middle speed ramp parameters and acceptance.
- Modification to the tests for Type I fluids at lower temperatures when nitrogen is required.
- Change the percentage of elimination requirement to maximum final thickness for AMS1428 fluids for uniformity.

TABLE OF CONTENTS

1.	SCOPE.....	4
2.	REFERENCES	4
2.1	Applicable Documents	4
2.1.1	SAE Publications	4
2.1.2	ASTM Publications.....	4
2.1.3	Other Publications.....	4
2.2	Glossary	5
2.2.1	Abbreviations	5
2.2.2	Parameters	5
3.	GENERAL INFORMATION	6
3.1	Description of Tests	6
3.2	Reference Fluids.....	9
3.2.1	High Speed Ramp Reference Fluid	9
3.2.2	Middle Speed Ramp Reference Fluid	9
3.2.3	Low Speed Ramp Reference Fluid.....	9
3.3	Fluid Acceptance and Facility/Site Qualification.....	9
3.4	Safety Hazards	9
4.	TEST FACILITY REQUIREMENTS	9
4.1	Calibration and Test Equipment	10
4.2	Test Duct Description.....	10
4.2.1	Material.....	10
4.2.2	Dimensions	10
4.2.3	Tolerances.....	10
4.2.4	Design Features.....	10
4.3	Test Duct Gas Flow Core Characteristics	10

SAE Executive Standards Committee Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2021 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
http://www.sae.org

SAE WEB ADDRESS:

Full document details: SAE AS5900E

For more information on this standard, visit
<https://www.sae.org/standards/content/AS5900E/>

Documents

Document Sharing Hub

4.3.1	Test Gas	10
4.3.2	Temperature Measurement	10
4.3.3	Gas Pressures	11
4.3.4	Gas Velocity	11
4.3.5	Relative Humidity	12
4.4	Test Fluid Temperature Measurement	12
4.5	Test Facility Drainage	12
4.6	Example Facility	12
5.	TEST FLUID REQUIREMENTS	12
5.1	General	12
5.2	Fluid Identification	12
5.2.1	Viscosity	13
5.2.2	Surface Tension	13
5.2.3	Refractive Index	13
5.2.4	pH	13
6.	TEST PROCEDURE	13
6.1	Test Requirements	13
6.2	Test Run Sequence	14
6.2.1	Select Target Temperatures	14
6.2.2	Pre-Cool Test Fluid	14
6.2.3	Pre-Cooling of Test Facility	14
6.2.4	Fluid Water Content Measurement	14
6.2.5	Application of Fluid to Test Duct Floor	14
6.2.6	Fluid Settling Conditions	14
6.2.7	Takeoff Velocity Time History	14
6.2.8	Termination of Test Run	15
6.2.9	Residual Fluid Analysis	15
6.2.10	Fluid Final Thickness Measurements	15
6.2.11	Data Processing	16
6.3	Test Cautions	16
6.3.1	Safety Hazards	16
6.3.2	Frost	16
6.3.3	Variation of Water Content	16
6.3.4	Irregular BLDT Data	16
6.4	Data Processing	16
6.4.1	Test Data Description	16
6.4.2	Calculation Methods	17
6.5	Test Bias Accuracy and Precision	18
6.5.1	General Accuracy	18
6.5.2	Dry BLDT Bias	18
6.5.3	Fluid BLDT Bias	18
7.	DEICING/ANTI-ICING FLUID ACCEPTANCE CRITERIA	18
7.1	Fluid Acceptance Criteria	19
7.1.1	High Speed Ramp Tests	19
7.1.2	Middle Speed Ramp Tests	19
7.1.3	Low Speed Ramp Tests	19
7.2	Fluid Acceptance Criteria Background	19
7.2.1	High Speed Ramp Tests	19
7.2.2	Middle Speed Ramp Tests	19
7.2.3	Low Speed Ramp Tests	20
7.3	Fluid Acceptance	20
7.3.1	Initial Testing	20
7.3.2	Re-Testing	20
7.4	Continued Acceptance of Test Fluid	20
8.	TEST RESULTS	

9.	REPORT.....	21
10.	NOTES	21
10.1	Revision Indicator	21
APPENDIX A	Additional test temperatures for AMS1428 neat fluids.....	30
APPENDIX B	Modification to High Speed Ramp BLDT acceptance limit to a constant.....	32
APPENDIX C	DEVELOPMENT OF THE MIDDLE SPEED RAMP	35
Figure 1	V speeds diagram for high speed ramp	7
Figure 2	V speeds diagram for middle speed ramp (for speed definitions, see Figure 1).....	8
Figure 3	V speeds diagram for low speed ramp (for speeds definition, see Figure 1).....	8
Figure 4	Test duct schematic	21
Figure 5	Takeoff ground acceleration simulation for high speed ramp.....	22
Figure 6	Takeoff ground acceleration simulation for low speed ramp.....	22
Figure 7	Example of facility schematic	23
Figure 8	Example of data acquired during high speed ramp test run.....	24
Figure 9	Example of data acquired during low speed ramp test run	25
Figure 10	Example of test fluid identification sheet.....	26
Figure 11	Example of test data summary	27
Figure 12	Example of high speed ramp test result summary.....	28
Figure 13	Example of low speed ramp test result summary.....	29
Table 1	High speed ramp reference fluid.....	9

1. SCOPE

This SAE Aerospace Standard (AS) establishes the aerodynamic flow-off requirements and test procedures for AMS1424 Type I and AMS1428 Type II, III, and IV fluids used to deice and/or anti-ice aircraft.

The objective of this standard is to ensure acceptable aerodynamic characteristics of the deicing/anti-icing fluids as they flow off of aircraft lifting and control surfaces during the takeoff ground acceleration and climb. Aerodynamic acceptance of an aircraft ground deicing/anti-icing fluid is based upon the fluid's boundary layer displacement thickness (BLDT) on a flat plate, measured after experiencing the free stream velocity time history of a representative aircraft takeoff. Acceptability of the fluid is determined by comparing BLDT measurements of the candidate fluid with a datum established from the values of a reference fluid BLDT and the BLDT over the dry (clean) test plate. Testing is carried out in the temperature range at which the fluid, undiluted and diluted, is to be used in airline service.

NOTE: No additional aerodynamic testing is required for non-glycol fluids at this time. For more information about non-glycol fluids, please refer to AMS1424 and AMS1428.

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.

AMS1424	Fluid, Aircraft Deicing/Anti-Icing, SAE Type I
AMS1428	Fluid, Aircraft Deicing/Anti-Icing, Non-Newtonian (Pseudoplastic), SAE Types II, III, and IV
ARP6852	Methods and Processes for Evaluation of Aerodynamic Effects of SAE-Qualified Aircraft Ground Deicing/Anti-Icing Fluids

2.1.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D1193	Reagent Water
ASTM D1331	Surface and Interfacial Tension of Solutions of Surface-Active Agents
ASTM D1747	Refractive Index of Viscous Materials
ASTM D2196	Viscosity Measurements and Rheological Properties of Non-Newtonian Materials by Rotational (Brookfield) Viscometer
ASTM E70	pH of Aqueous Solutions with the Glass Electrode

2.1.3 Other Publications

Beisswenger, A., Laforte, J.L., Tremblay, M.M., and Perron, J., "Investigation of a New Formulation Reference Fluid for Use in Aerodynamic Acceptance Evaluation of Aircraft Ground Deicing and Anti-Icing Fluid," prepared for the Federal Aviation Administration, under press, DOT/FAA/AR-06/50.

Louchez, P.R., Laforte, J.L., and Bouchard, G. (UQAC), "Boundary Layer Evaluation of Anti-Icing Fluids for Commuter Aircraft," prepared for Transportation Development Center, Policy and Coordination, Transport Canada, TP11811E, August 1994.

Hill, E.G. and Zierten, T.A., "Aerodynamic Effects of Aircraft Ground Deicing/Anti-Icing Fluids," Journal of Aircraft, Vol. 30, No. 1, Jan.-Feb., 1993, pp. 24-34.

2.2 Glossary

2.2.1 Abbreviations

BLDT	Boundary Layer Displacement Thickness
cm	Centimeter
Hz	Hertz
LAAT	Lowest Acceptable Aerodynamic Temperature
m	Meter
mm	Millimeter
Pa	Pascal
pH	Potential of Hydrogen
RH	Relative Humidity
RPM	Revolutions per Minute

2.2.2 Parameters

b	Cross-Section Width at Station 3
c	Cross-Section Perimeter at Station 3
t	Time
S ₁	Settling Chamber Cross-Section Area (Station 1)
S ₂	Test Duct Cross-Section Area at Station 2
S ₃	Test Duct Cross-Section Area at Station 3
P ₁	Settling Chamber Static Pressure (Station 1)
P ₂	Static Pressure at Station 2
P ₃	Static Pressure at Station 3
T _g	Gas Temperature (Wind)
T _f	Fluid Temperature (Deicing/Anti-Icing Fluid)
T _t	Target Temperature
V	Average Wind Velocity in Flow Core (at Station 2)

V_i	Idle Wind Velocity
V_m	Maximum Wind Velocity
V_s	Start-Up Wind Velocity
δ^*_d	BLDT Over Dry Surface (at Station 3)
δ^*_f	BLDT Over Fluid-Coated Surface (at Station 3)
δ^*_{ave}	BLDT Perimeter Average Between δ^*_f and δ^*_d
δ^*_r	δ^*_f Value for Reference Fluid
δ^*_0	Maximum Acceptable Value for δ^*_f at 0 °C
δ^*_{-20}	Maximum Acceptable Value for δ^*_f at -20 °C
ρ	Gas Density Mass per Unit Volume

3. GENERAL INFORMATION

3.1 Description of Tests

The aerodynamic flow-off requirements and test procedures for AMS1424 Type I and AMS1428 Type II, III, and IV deicing/anti-icing fluids are described as follows:

- a. The high speed ramp test is used to simulate large jet aircraft takeoffs, with rotation speeds exceeding 100 knots and a time from brake release to rotation speed greater than 20 seconds. The test is conducted at 65 m/s (126 knots), representing a nominal speed at which an aircraft may safely become airborne with one engine inoperative (V_2), after a 25 second acceleration at 2.6 m/s² (see Figure 1).

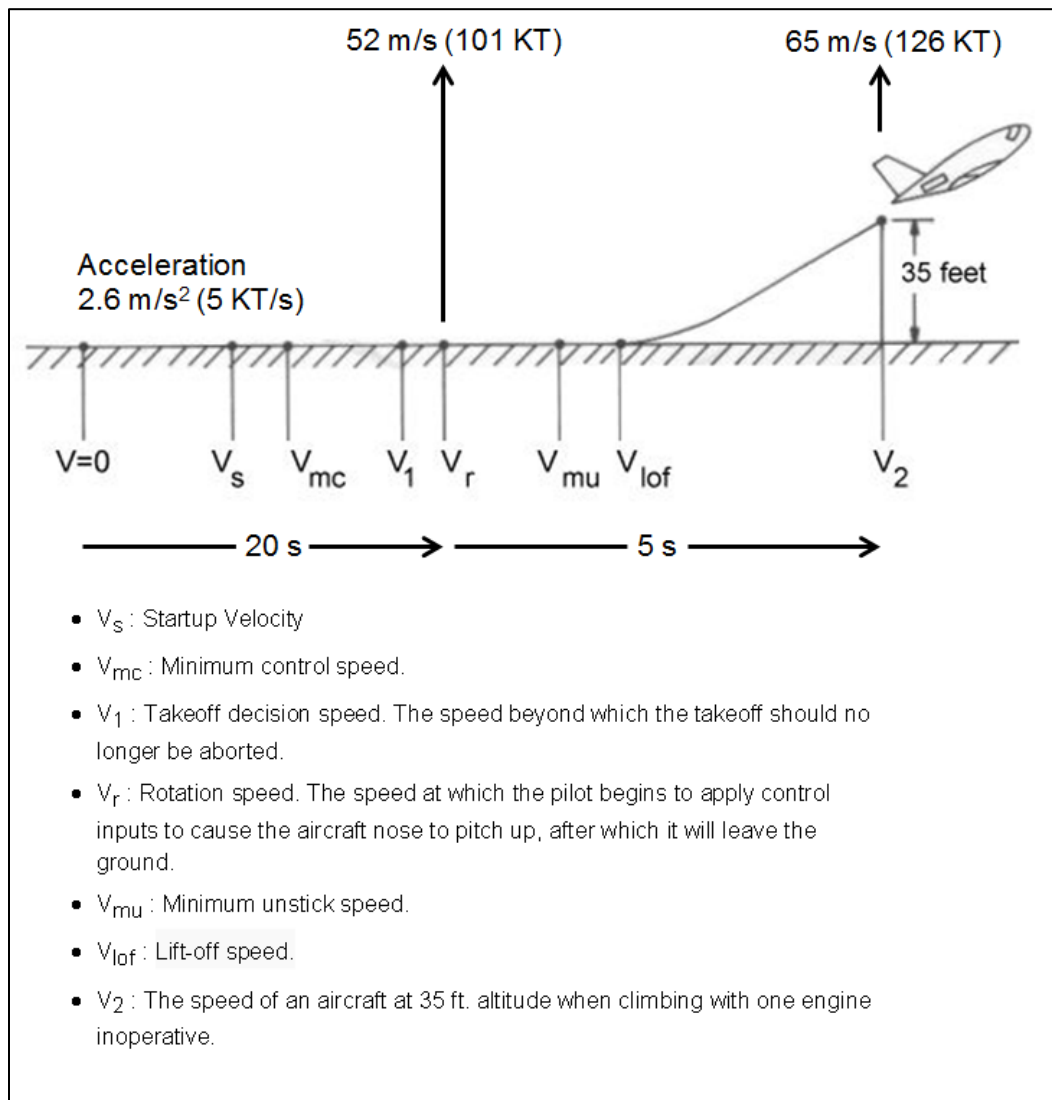


Figure 1 - V speeds diagram for high speed ramp

- b. The middle speed ramp test is used to simulate larger turbo-prop aircraft takeoffs, with rotation speeds between 80 knots and 100 knots and a time from brake release to rotation speed between 16 seconds and 20 seconds. The test is conducted at 46 m/s (90 knots), representing the lift-off speed (V_{lof}), after an 18 second acceleration at 2.6 m/s² (see Figure 2). For more information on the development of this ramp, please see Appendix C

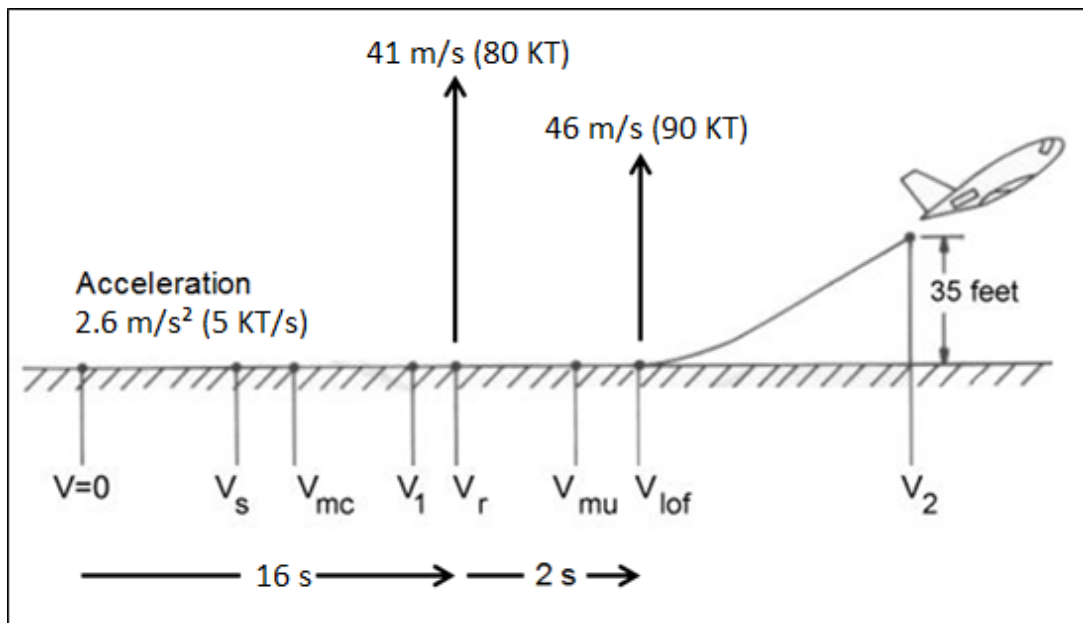


Figure 2 - V speeds diagram for middle speed ramp (for speed definitions, see Figure 1)

- c. The low speed ramp test is used to simulate commuter turbo-prop aircraft takeoffs, with rotation speeds between 60 knots and 100 knots, and a time from brake release to rotation speed between 15 seconds and 20 seconds. The test is conducted at $35 \text{ m/s (70 knots)}$, representing the lift-off speed (V_{lof}), after a 17 second acceleration at 2.1 m/s^2 (see Figure 3).

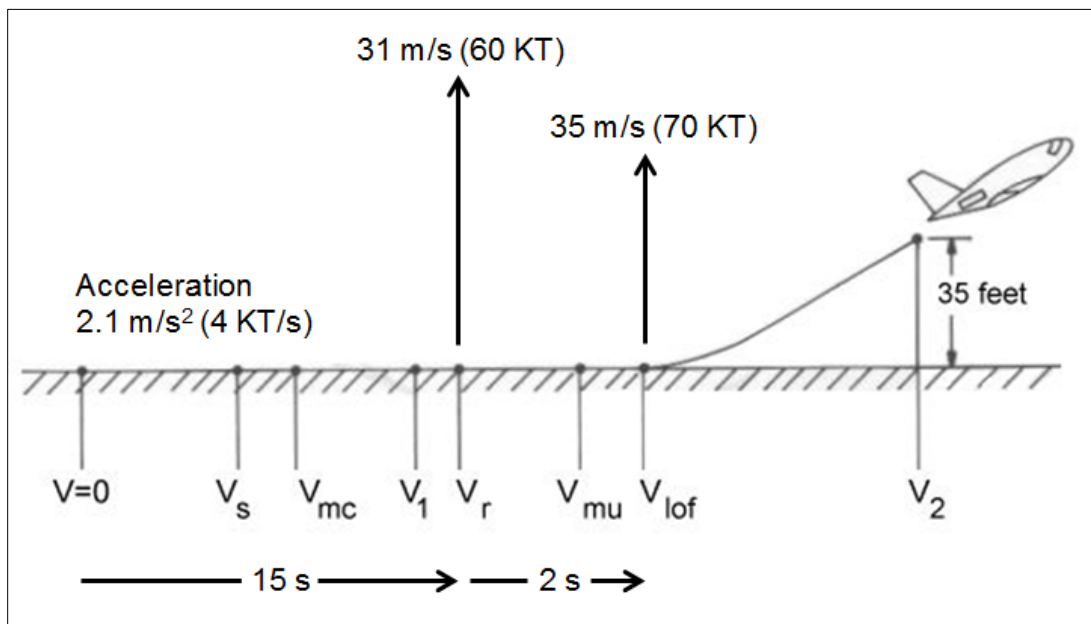


Figure 3 - V speeds diagram for low speed ramp (for speeds definition, see Figure 1)

NOTE: When compensating measures, such as increased rotation speeds, are used for low speed aircraft takeoff procedures, the middle speed ramp or high speed ramp may apply at the option of the applicant.

3.2 Reference Fluids

3.2.1 High Speed Ramp Reference Fluid

The fluid shall be homogeneous with:

- A refractive index, as determined at $20\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$ in accordance with ASTM D1747, of 1.4276 ± 0.0005 , and
- A viscosity, as measured with a Brookfield LV viscometer at 6 rpm LV1 spindle in accordance with ASTM D2196 at $0\text{ }^{\circ}\text{C}$, of $150\text{ mPa}\cdot\text{s} \pm 25\text{ mPa}\cdot\text{s}$.

Table 1 - High speed ramp reference fluid

Component	Percent by Weight
	(%w/w)
Propylene glycol	68.0 ± 0.1
Tripropylene glycol	20.0 ± 0.1
Demineralized water	12.0 ± 0.1

3.2.2 Middle Speed Ramp Reference Fluid

The high speed ramp reference fluid (3.2.1) is used for the middle speed ramp.

3.2.3 Low Speed Ramp Reference Fluid

The low speed ramp reference fluid consists of the high speed ramp reference fluid, as described in 3.2.1, diluted 75% by volume fluid and 25% by volume water, with a refractive index as determined at $20\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$ in accordance with ASTM D1747, of 1.4081 ± 0.0005 .

3.3 Fluid Acceptance and Facility/Site Qualification

An aircraft ground deicing/anti-icing fluid has acceptable aerodynamic flow-off characteristics if the fluid is tested in accordance with this standard and complies with the acceptance criteria described in Section 7.

If results from testing in accordance with this test method are to be used to verify that an aircraft ground deicing/anti-icing fluid complies with the acceptance criteria described in Section 7, substantiation that the facility and associated staff and resources satisfy the requirements of this test method shall be documented and submitted to the Performance Review Institute, 161 Thornhill Road, Warrendale, PA 15086-7527, United States of America, or equivalent qualified third-party reviewers, to qualify the technical suitability and competency of the test facility/site. Such test facilities/sites shall be qualified at five-year intervals by submitting current data, which demonstrate that, the facility, instrumentation, procedures, supporting resources, and staff continues to produce acceptable data. The facility/site must be independent from fluid manufacturer.

3.4 Safety Hazards

This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address the safety problems associated with its use. It is the responsibility of the user of this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

4. TEST FACILITY REQUIREMENTS

The following describes a facility used to measure the aerodynamic flow-off acceptability of deicing/anti-icing fluids. Testing shall be performed in a horizontal duct having the following geometry, flow characteristics, and instrumentation. In addition, the technical capability of the facility/site shall also include the ability to obtain the data required in this section. The test facility shall have access to adequate transducer calibration facilities to ensure accuracy and precision requirements, and trained personnel to execute the test method.

4.1 Calibration and Test Equipment

All temperature sensors, humidity sensors, electronic balances, anemometers, and timing devices shall be maintained in a known state of calibration by means of a documented process. Each instrument used as a reference shall be calibrated by a certified laboratory which uses primary standards that are directly traceable to the U.S. National Institute of Standards and Technology and/or the National Research Council of Canada, or any other recognized national standards organization.

4.2 Test Duct Description

4.2.1 Material

The composition of the test duct shall be Plexiglas.

4.2.2 Dimensions

See Figure 3.

4.2.3 Tolerances

Linear dimensions: $\pm 2\%$ S_2/S_3 : 0.927 ± 0.010 .

4.2.4 Design Features

The test duct floor shall be horizontal, while the ceiling shall slope upward linearly 8 mm from station 2 to station 3.

4.2.4.1 For high speed ramp tests, duct surfaces shall be hydraulically smooth, resulting in a dry BLDT ≤ 2.9 mm at station 3, at $65 \text{ m/s} \pm 5 \text{ m/s}$.

4.2.4.2 For middle speed ramp tests, duct surfaces shall be hydraulically smooth, resulting in a dry BLDT ≤ 3.1 mm at station 3, at $46 \text{ m/s} \pm 5 \text{ m/s}$.

4.2.4.3 For low speed ramp tests, duct surfaces shall be hydraulically smooth, resulting in a dry BLDT ≤ 3.2 mm at station 3, at $35 \text{ m/s} \pm 3 \text{ m/s}$.

4.3 Test Duct Gas Flow Core Characteristics

4.3.1 Test Gas

The test gas used should be air, nitrogen, or another suitable gas proven to have no adverse effect on the overall testing method.

4.3.2 Temperature Measurement

The gas temperature during tests shall be measured at station 2 approximately 5 mm below the ceiling using copper-constantan thermocouples with a 0.2 mm wire diameter and a measuring junction of approximately 0.5 mm^3 (Thermocouples T: range -180 to $+400$ °C, sensitivity ± 0.1 °C, accuracy ± 0.5 °C). Thermocouple calibrations should be performed at the beginning and end of a sequence of test runs.

4.3.2.1 Temperature Range

The test gas temperature range shall be 0 °C to approximately -40 °C.

4.3.2.2 Temperature Stability

The test duct shall either be thermally insulated or be installed within the test section and capable of being pre-cooled to ensure thermal equilibrium of the test duct during a test run.

The temperature in the test duct shall be $\pm 2^\circ\text{C}$ of the target temperature, with a continuous flow ≥ 60 seconds, except $\leq \pm 1^\circ\text{C}$ between the 27th and 33rd seconds for a high speed ramp test run, between the 18th and 24th seconds for a middle speed ramp test run or between the 17th and 23rd seconds for a low speed ramp test run.

4.3.2.3 Temperature Spatial Uniformity

The temperature spatial uniformity shall be $\pm 1^\circ\text{C}$.

4.3.3 Gas Pressures

4.3.3.1 Total Pressure, P_1

Total pressure, P_1 , may be measured as the static pressure in the settling chamber immediately upstream of the test duct, station 1, using a 3 mm diameter flush orifice tapped into the chamber sidewall if the velocities are low, in accordance with standard wind tunnel practice.

4.3.3.2 Inlet Static Pressure, P_2

Inlet static pressure, P_2 , is measured using a 3 mm diameter flush orifice tapped into the middle of the ceiling at station 2, free of flow disturbances from the station 2 temperature probe.

4.3.3.3 Outlet Static Pressure, P_3

Outlet static pressure, P_3 , is measured using a 3 mm diameter flush orifice tapped into the middle of the ceiling at station 3.

4.3.3.4 Pressure Sensor

Two pressure transducers are used to measure $(P_1 - P_2)$ and $(P_2 - P_3)$ pressure differentials. The pressure transducer used for $(P_2 - P_3)$ shall have a range of at least 300 Pa with a $\pm 0.5\%$ accuracy. The pressure transducer used for $(P_1 - P_2)$ shall have a 3000 Pa range and a $\pm 1\%$ accuracy. Data stability (time variations less than 0.5%) and time response (less than 0.1 second delay) shall be achieved by appropriate data filtering and smoothing techniques. Low-pass filtering between 1 Hz and 5 Hz and data sampling at least twice the cut-off frequency of the filter is recommended. Calibration of the measurement system shall be performed over the entire range using a reference apparatus (with accuracy of $\pm 0.25\%$ for $(P_2 - P_3)$ and $\pm 0.5\%$ for $(P_1 - P_2)$) before and after each complete test session.

4.3.4 Gas Velocity

The velocity of the gas in the test duct is that at station 2. Velocity shall be computed using Equation 1 (see 6.4.2.1).

Because of possible pressure leaks and losses, a calibrated pitot-static probe shall be periodically used to verify use of Equation 1.

4.3.4.1 Velocity Range

4.3.4.1.1 For High Speed Ramp Tests

The high speed ramp velocity range shall be: $V \leq 5 \text{ m/s}$ to $65 \text{ m/s} \pm 5 \text{ m/s}$ within $t = 25 \text{ seconds} \pm 2 \text{ seconds}$, following a constant acceleration of 2.6 m/s^2 (measured at station 2), with a minimum flow velocity of $65 \text{ m/s} \pm 5 \text{ m/s}$, 30 seconds after start, and maintained for 30 additional seconds (see Figure 5). Prior to the flow acceleration, the duct flow shall be capable of a 5 minute settling period with a velocity $\leq 5 \text{ m/s}$.

4.3.4.1.2 For Middle Speed Ramp Tests

The middle speed ramp velocity range shall be: $V \leq 5 \text{ m/s}$ to $46 \text{ m/s} \pm 5 \text{ m/s}$ within $t = 18 \text{ seconds} \pm 2 \text{ seconds}$, following a constant acceleration of 2.6 m/s^2 (measured at station 2), with a minimum flow velocity of $46 \text{ m/s} \pm 5 \text{ m/s}$, 21 seconds after start, and maintained for 39 additional seconds. Prior to the flow acceleration, the duct flow shall be capable of a 5 minute settling period with a velocity $\leq 5 \text{ m/s}$.

4.3.4.1.3 For Low Speed Ramp Tests

The low speed ramp velocity range shall be: $V \leq 5 \text{ m/s}$ to $35 \text{ m/s} \pm 3 \text{ m/s}$ within $t = 17 \text{ seconds} \pm 1 \text{ second}$, following a constant acceleration of 2.1 m/s^2 (measured at station 2) with a minimum flow velocity of $35 \text{ m/s} \pm 3 \text{ m/s}$, 20 seconds after start, and maintained for 40 additional seconds (see Figure 6). Prior to the flow acceleration, the duct flow shall be capable of a 5 minute settling period with a velocity $\leq 5 \text{ m/s}$.

4.3.4.2 Velocity Spatial Uniformity

Vertical and lateral: $\Delta U/U_\infty \leq \pm 0.005$.

Longitudinal: $\Delta U \leq -1 \text{ m/s/m} \pm 0.008 U_\infty/\text{m}$.

4.3.4.3 Turbulence

Turbulence shall be $\leq 0.005 (\Delta U/U_\infty)$ and may be measured using hot wire or film sensors or other means in accordance with commonly accepted wind tunnel practices.

4.3.5 Relative Humidity

Relative humidity shall be $70\% \pm 30\%$, measured with wet bulb-dry bulb thermometers. If an equivalent device is utilized, it shall be regularly calibrated against wet bulb-dry bulb thermometers.

4.4 Test Fluid Temperature Measurement

The test fluid temperature shall be measured at station 3 within the test fluid, approximately 1 mm above the floor.

4.5 Test Facility Drainage

Drainage shall be provided downstream of the test duct, in a region of low velocity, to remove test fluid and to ensure no fluid returns upstream to the test duct.

4.6 Example Facility

An example facility consists of a closed circuit, refrigerated wind tunnel with a $0.5 \times 0.5 \text{ m}$ test section. The test duct is inserted in the test section of the wind tunnel. The test duct may be fitted with a short inlet convergent to achieve required maximum speed, and with a long diffuser to avoid large power losses due to wake effects. The facility has a settling chamber fitted with honeycomb and/or grids, and a 9:1 contraction ratio separates this chamber and the wind tunnel test section entrance in order to provide good airflow quality. A 50 hp fan drive motor with variable RPM is controlled, by computer, via the time signal of the difference between actual wind velocity and required value. Refrigeration is obtained via a heat exchanger placed upstream of the settling chamber; a two stage Freon-glycol refrigeration circuit powered by a 75 hp compressor provides adequate temperature setting (-30°C). A schematic of the example facility is shown in Figure 6.

5. TEST FLUID REQUIREMENTS

5.1 General

Fluids submitted for testing shall be experimental fluids or fluids which are representative of production fluids, shall have been manufactured during the previous three months, shall be from the same lot submitted for the water spray endurance test and the high humidity endurance test of AS5901, but unshredded. A volume of about 1 L of the lot is required for one test run. Samples to be tested in diluted form shall be diluted by the testing facility, using water conforming to ASTM D1193, Type IV. The manufacturer shall mark each fluid sample container with the company name, product name, lot number, location, and date of manufacture.

5.2 Fluid Identification

The aerodynamic acceptance testing facility shall identify the fluid by testing for the following: