

**Process to Obtain Holdover Times for Aircraft Deicing/Anti-Icing Fluids,
SAE AMS1428 Types II, III, and IV**

RATIONALE

This document has been updated to reflect current practices for obtaining holdover times for Type II, III and IV fluids. This includes the addition of a protocol to obtain holdover times for Type III fluids applied heated, the addition of a protocol for obtaining fluid-specific tables for fluid licensees, and clarification of the rounding protocol used when converting endurance times to holdover times. Editorial changes have been made to reflect the current format of the holdover time guidelines and to improve clarity.

FOREWORD

Meeting all of the technical requirements of AMS1428 is not sufficient for a Type II, III or IV de/anti-icing fluid to be used on an aircraft. For such a fluid to be used commercially, it must also have a holdover time guideline and be identified on a list of fluids published by regulators¹. Before commercialization, it is further recommended that a field spray trial be conducted with the fluid to demonstrate acceptable operational performance.

The intent of this ARP is to help fluid manufacturers and users understand the overall process that a Type II, III or IV fluid must go through to obtain holdover time guidelines and be included on the Transport Canada and Federal Aviation Authority (FAA) lists of fluids.

¹ The aircraft manufacturers must also identify the types of fluids which can be applied to their aircraft type. This information is usually located in the maintenance manual winter operations section or in the Aircraft Operating Manual (AOM).

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1. SCOPE

This document describes:

- a. the preparatory steps to test experimental Type II, III, and IV fluids according to AMS1428;
- b. the recommendations for the preparation of samples for endurance time testing according to ARP5485;
- c. a short description of the recommended field spray test;
- d. the protocol to generate draft holdover time guidelines from endurance time data obtained from ARP5485;
- e. the protocol for inclusion of Type II, III, and IV fluids on the FAA and Transport Canada lists of fluids and the protocol for updating the lists of fluids;
- f. the role of the SAE G-12 Aircraft Deicing Fluids Committee;
- g. the role of the SAE G-12 Holdover Time Committee;
- h. the process for the publication of Type II, III, and IV holdover time guidelines.

This document does not describe laboratory testing procedures.

This document does not include the qualification process for AMS1424 Type I fluids.

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 724-776-4970 (outside USA), www.sae.org.

AS5900	Standard Test Method for Aerodynamic Acceptance of SAE AMS 1424 and SAE AMS 1428 Aircraft Deicing/Anti-icing Fluids
AS5901	Water Spray and High Humidity Endurance Test Methods for SAE AMS1424 and SAE AMS1428 Aircraft Deicing/Anti-icing Fluids
ARP5485	Endurance Time Tests for Aircraft Deicing/Anti-icing Fluids, SAE Type II, III, and IV
ARP5945	Endurance Time Tests for Aircraft Deicing/Anti-icing Fluids, SAE Type I
AMS1424	Deicing/Anti-Icing Fluid, Aircraft, SAE Type I
AMS1428 ²	Fluid, Aircraft Deicing/Anti-Icing, Non-Newtonian (Pseudoplastic), SAE Types II, III, and IV

² AMS1428 paragraph numbers throughout this ARP5718 are from AMS1428G.

2.1.2 FAA Publications

Available from Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591, Tel: 866-835-5322, www.faa.gov.

FAA Holdover Time Guidelines (These are published every winter. Always use the latest issue; search for "FAA Holdover Time".)

FAA-Approved Deicing Program Updates, Winter 20XX-20XX (These are published every winter. Always use the latest issue; search for "FAA-Approved Deicing Program".)

2.1.3 Transport Canada Publications

Available from the Transportation Development Center, Transport Canada, 330 Sparks St., 26th Floor, Ottawa ON K1A 0N5, Canada and at <http://www.tc.gc.ca/eng/civilaviation/standards/commerce-holdovertime-menu-1877.htm>.

Transport Canada Holdover Time Guidelines. (These are published every winter. Always use the latest issue).

Guidelines for Aircraft Ground Icing Operations. TP14052E, April 2005.

2.2 Definitions and Abbreviations

AERODYNAMIC ACCEPTANCE: A performance test required under §3.2.5 of AMS1428 and defined in AS5900.

ENDURANCE TIME: Time that a fluid can endure defined and controlled temperature and precipitation conditions before visual failure. Endurance time tests are defined in ARP5485.

FAA: United States Department of Transportation, Federal Aviation Administration.

FLUID-SPECIFIC HOLDOVER TIME (HOT) GUIDELINE: A holdover time guideline that contains holdover times for a specific Type II, III or IV fluid. A fluid-specific holdover time guideline can only be used with the specific fluid it is intended for; it cannot be used with any other fluid.

GENERIC HOLDOVER TIME (HOT) GUIDELINE: A holdover time guideline that contains holdover times for a given fluid type (i.e., AMS1428 Type II, Type III or Type IV). A generic holdover time guideline can be used with any fluid that is certified to be the same fluid type as the generic guideline. In the case of Type II, III and IV fluids, the holdover times in the generic holdover time guideline represent the lowest holdover time performance (worst case) of all fluids separated by fluid type under all conditions (see 5.6).

HOLDOVER TIME (HOT): Time a fluid is expected to provide protection of an aircraft against freezing or frozen precipitation from the initial application of fluid.

HOLDOVER TIME GUIDELINE: A table giving the holdover time for various precipitation conditions and temperatures with cautions and notes giving guidance to ground deicing/anti-icing crews and pilots. The "holdover time guideline" is also often referred to as "holdover time table".

LOWER SALES SPECIFICATION VISCOSITY LIMIT: Viscosity set by the fluid manufacturer for its sales specification. This viscosity must be equal to or higher than the AMS1428 low viscosity and must be higher than the lowest on-wing viscosity (LOWV).

LOWEST ON-WING VISCOSITY (LOWV): Viscosity reported by the laboratory performing the testing under §3.1.3 of ARP5485. The LOWV is published with the specific holdover time guideline for that fluid. Fluids having an on-wing viscosity less than the LOWV cannot be used with holdover time guidelines. The LOWV must be below the lower sales specification viscosity limit.

LOWEST OPERATIONAL USE TEMPERATURE (LOUT): The lowest operational use temperature of a Type II/III/IV fluid is generally recognized as the higher of:

- a. the lowest temperature at which it meets the aerodynamics acceptance test (AS5900) for a given type of aircraft or
- b. the freezing point of the fluid plus the freezing point buffer of 7 °C (about 13 °F).

MAXIMUM ON-WING VISCOSITY (MOWV): See AMS1428 high viscosity. Fluids having a viscosity higher than the MOWV must not be used.

OAT: Outside Air Temperature.

TRANSPORT CANADA/FAA LISTS OF FLUIDS: Lists published by Transport Canada and the FAA in their Holdover Time Guidelines which include fluids that have been tested for endurance times (according to ARP5485), anti-icing performance (according to AMS1428 §3.2.4 using the test method in AS5901) and aerodynamic acceptance (AMS1428 §3.2.5 using the test method in AS5900) only.

UPPER SALES SPECIFICATION VISCOSITY LIMIT: Viscosity set by the fluid manufacturer for its sales specification. This viscosity must be equal to or lower than the AMS1428 high viscosity or MOWV.

WATER SPRAY ENDURANCE TEST (WSET): A performance test defined in AS5901.

3. SAMPLE SELECTION AND LABORATORY TESTING

3.1 Preliminary Work

In the course of development work, it is normal for fluid manufacturers to prepare various samples and verify the physical and performance properties of the fluids. To do this they usually perform a certain amount of work within their own laboratories and will verify their results by having samples tested by the various external laboratories performing AMS1428 testing. Such laboratories are listed in 3.5.

3.2 Testing According to AMS1428

3.2.1 Sample Selection

Fluid testing according to AMS1428 is performed on two samples: the high viscosity preproduction sample and the low viscosity preproduction sample. AMS1428 describes these samples (see §4.2.3 of AMS1428) and the tests to be performed on each. The fluid manufacturer should select these viscosities carefully as the viscosities measured will be used to establish quality control limits for fluid being delivered for use (see §3.2.3 of AMS1428). The viscosity measured on the high viscosity preproduction sample will become the maximum on-wing viscosity (MOWV) for that fluid.

Typically, 12 L of the high viscosity preproduction sample and 6 L of the low viscosity sample are required to do the anti-icing performance (§3.2.4 of AMS1428 and AS5901) and aerodynamic acceptance (§3.2.5 of AMS1428 and AS5900) testing. Other AMS1428 tests such as environmental testing (§3.1.4), flash point (§3.2.1.1), specific gravity (§3.2.1.2), pH (§3.2.1.3), fluid stability (§3.2.2), and effect on aircraft materials (§3.3.2) require about 12 L. Additional material is required to complete other technical requirements specified in AMS1428. Fluid manufacturers should ask the testing laboratories for the exact quantities to be shipped.

3.2.2 AMS 1428 Appendix A Samples

Qualification testing is performed during pre-production using the Maximum On-wing Viscosity (MOWV) sample. This testing may be performed by any approved laboratory (refer to §3.5).

A maximum weight is set in AMS1428 (§3.2.2.4) for the rehydrated residues. However, even at weights below this, residues may occur during aircraft operation which can cause flight safety issues. Therefore, fluid manufacturers are encouraged to develop new fluids which will produce little or no residues.

If the fluid is to be produced commercially, a neat sample of the Maximum On-wing Viscosity (MOWV) preproduction fluid and a neat sample of the Lowest On-wing Viscosity (LOWV) fluid, as submitted for Endurance Time testing per ARP5485 (as described in §1.1), must be submitted to AMIL for all SAE Type II, III and IV fluids. Both samples will be tested and the results published in the Comparison Gel Residue Tables on the AMIL website (<http://www.ugac.ca/amil/en/gelresidues/index.htm>), as required by the AMS1428 specification.

3.3 Endurance Time Testing According to ARP5485

3.3.1 Sample Selection

It is specified in §3.1.1 of ARP5485 that the fluid manufacturer must provide a sample from a production batch. The viscosity should be reduced by the manufacturer. The fluid manufacturer should select the viscosity carefully as the viscosity measured by the testing laboratory will become the lowest on-wing viscosity (LOWV) for that fluid.

Quantities of fluid required for ARP5485 testing are approximately 120 L of neat (100%) fluid, 100 L of 75/25 dilution fluid and 60 L of 50/50 dilution fluid. Fluid manufacturers should ask the testing laboratory for the exact quantities required.

3.4 Water Spray Endurance Test Time Requirements

Refer to ARP5485 (§3.1.2) and AMS1428 (§3.2.4.1) for minimum WSET time requirement.

3.5 Testing Laboratories

As of the date of publication of the ARP the following laboratories are known to provide testing for de/anti-icing fluids. This is not an endorsement by SAE for these laboratories but simply a list to facilitate the finding of laboratories for those seeking fluid qualification. Please enquire directly with the laboratories for a full list of testing available.

APS Aviation Inc., 6700, chemin de la Côte-de-Liesse, Suite 105, Saint-Laurent, Quebec, H4T 2B5, Canada; 514-878-4388; www.adga.ca/aps provides endurance time testing described in ARP5485.

Anti-icing Materials International Laboratory (AMIL), 555, boulevard de l'Université, Chicoutimi, Québec, G7H 2B1, Canada; 418-545-5011 ext. 2406; www.ugac.ca/amil, provides testing for exposure to dry air (§3.2.2.2 of AMS1428), anti-icing performance (§3.2.4 of AMS1428 and AS5901), aerodynamic acceptance (§3.2.5 of AMS1428 and AS5900) and endurance time testing described in ARP5485.

Scientific Material International, 12219 SW 131st Avenue, Miami, Florida, USA 33186-6401; 305-971-7047; www.smiinc.com, provides testing to generate most environmental information (§3.1.4 of AMS1428), several of the tests described under §3.2.1 of AMS1428 and effect on materials testing (§3.3.2, §3.3.3, §3.3.4, §3.3.5 of AMS1428).

4. FIELD SPRAY TESTING

4.1 Reason for Field Spray Test

In the past, fluids that met all the requirements of AMS1428 could not be used commercially because of a significant flaw that could not be identified by laboratory testing but became known through a field spray test. Every time this happens, every effort is made to add new laboratory test requirements to AMS1428 to prevent a fluid with a serious flaw to be commercialized. Nevertheless, it is highly recommended to conduct a field spray test as (a) some fluid characteristics are not easily duplicated in the laboratory and (b) some unknown flaw may not be covered by AMS1428.

4.2 Sample Selection

The sample should be from a normal production batch. Usually 1000 L of fluid is sufficient to run a field spray test.

Sometimes it might be desirable to evaluate an experimental fluid before all testing is completed. Even if the fluid is washed away from the aircraft after the test, field tests on aircraft must be done with fluids that meet all the requirements of the Effect on Aircraft Materials (§3.3.2 of AMS1428), Effect on Painted Surfaces (§3.3.3 of AMS1428) and Effect on Unpainted Surfaces (§3.3.4 of AMS1428) to ensure that no damage will be done to the aircraft.

Never attempt a flight with a de/anti-icing fluid unless it meets all requirements of AMS1428.

4.3 Test Protocol

The fluid should be applied as supplied or in intended use dilutions and heated to intended use temperatures, applied through commercial deicing/anti-icing vehicle systems to an inclined flat or curved surface, preferably an aircraft wing or horizontal stabilizer, at pressures and flow rates normal for the intended use. Such field spray testing should be accomplished by experienced personnel who will prepare a detailed test protocol, observe carefully the behavior of the fluid and be on the look-out for deficiencies such as:

1. tendency to foam as described in §3.2.2.9 of AMS1428;
2. difficulty with the flow of the fluid over the surfaces to be covered;
3. insufficient color intensity to prevent interference from a layer of Type I fluid underneath (this phenomenon is known as bleed-through);
4. excessive color intensity;
5. residues.

Pre- and post-nozzle samples should be gathered, viscosity measured and verification made to ensure that post-nozzle samples are above LOWV and below MOWV.

4.4 Test Report

A written report should be prepared and be made available upon request to users.

5. PREPARATION OF DRAFT HOLDOVER TIME GUIDELINES AND FLUID LISTS

5.1 Holdover Time Guideline Format

5.1.1 Columns

Holdover time tables for Type II, III, and IV fluids have six columns representing categories of freezing or frozen precipitation:

1. Freezing fog
2. Snow, snow grains or snow pellets (this column is subdivided into very light, light and moderate intensity columns in Type III holdover time tables)
3. Freezing drizzle
4. Light freezing rain

5. Rain on cold soaked wing
6. Other

There is a separate active frost holdover time table which contains generic holdover times for active frost conditions for Type II, III, and IV fluids and also for Type I fluids. Fluid-specific holdover times are not provided for active frost conditions.

5.1.2 Rows

Holdover time tables for Type II and Type IV fluids have rows corresponding to the following temperature ranges: -3 °C and above, below -3 to -14 °C, and below -14 °C to LOU~~T~~.

Holdover time tables for Type III fluids have rows corresponding to the following temperature ranges: -3 °C and above, below -3 to -10 °C, and below -10 °C.

5.1.3 Cells

Type II and Type IV holdover time tables contain 24 cells; Type III holdover time tables contain 36 cells. Each cell provides a range of time during which a fluid at a specified concentration (100/0, 75/25, 50/50) may provide protection for a particular temperature range in a particular category of precipitation. The time range in each cell is typically defined by a lower time and upper time; these values represent the average failure time of the fluid at the upper and lower precipitation rate limits, respectively.

5.1.4 Notes

Notes are added to the holdover time tables, such as:

- a. Use light freezing rain holdover time if positive identification of freezing drizzle is not possible.
- b. "Other" comprises heavy snow, ice pellets, moderate and heavy freezing rain, and hail.
- c. No holdover time exists for freezing drizzle or light freezing rain below OAT of -10 °C (-14 °F).
- d. Ensure that the lowest operational temperature (LOU~~T~~) is respected.
- e. Use light freezing rain holdover times in conditions of light snow mixed with light rain.
- f. No holdover times exist for rain on cold soaked wing for 0 °C (32 °F) and below.

5.1.5 Cautions

Cautions are added to the holdover tables, such as:

- a. The time of protection will be shortened in heavy weather conditions, heavy precipitation rates or high moisture content.
- b. High wind velocity or jet blast may reduce holdover time below the lowest stated time in the range.
- c. Holdover time may be reduced when aircraft skin temperature is lower than OAT.
- d. Fluids used during ground deicing/anti-icing are not intended for and do not provide protection during flight.

5.1.6 Date

Generic and fluid-specific holdover time guidelines will have an issue date and/or a revision date.

5.2 Restrictions

Fluid manufacturers must inform Transport Canada and FAA or their designated delegate of the restrictions on use of their fluid, for instance, if the fluid is not to be used diluted or if the fluid cannot be used below a certain temperature. Fluid-specific holdover time guidelines must reflect such restrictions.

For Type III fluids, fluid manufacturers must stipulate if the fluid is intended to be used heated, unheated or both. Endurance time testing must be conducted with heated fluid, unheated fluid, or both, to correspond with the intended use. Holdover time tables will be developed correspondingly; two holdover time tables may be produced for a single fluid.

5.3 Holdover Time Values from Endurance Time Data

ARP5485 describes in detail all the conditions and the number of tests required to fill each of the cells of a holdover time table.

The endurance time data generated by ARP5485 is converted to holdover time data by: (a) multiplying the endurance data by a factor which as of the publication of this ARP is one, (b) rounding in accordance with 5.3.1, and (c) capping in accordance with 5.3.2.

5.3.1 Rounding of Holdover Time Values

5.3.1.1 Type II/IV Fluids

Holdover time values above 10.0 min are rounded off to the nearest whole "5" digit. For example, 55.1 to 57.4 min is rounded down to 55 min; 57.5 to 59.9 min is rounded up to 60 min. Holdover times below 10.0 min are rounded down to the nearest minute as a precautionary measure. For example, 9.9 min is rounded down to 9 min.

5.3.1.2 Type III Fluids

Holdover time values above 20.0 min are rounded off to the nearest whole "5" digit. Holdover times below 20.0 min are rounded down to the nearest minute as a precautionary measure. Rounding examples are provided in 5.3.1.1.

5.3.2 Capping of Holdover Time Values

Holdover time values are capped at 2 h for freezing precipitation, 4 h for freezing fog, and 12 h for frost.

5.4 Product Names

It is usual for fluid manufacturers to submit fluids bearing experimental names. This is normal as the decision to commercialize generally occurs after the results from ARP5485 testing are shared with the manufacturer. If the manufacturer decides to commercialize the fluid, they must give the laboratories that tested for AMS1428 and ARP5485 and Transport Canada and the FAA, who publish the holdover time guidelines, the final commercial name prior to May 1st proceeding the winter of commercial availability.

New fluids must be assigned new unique names. Fluids manufacturers who reformulate an existing fluid must give the fluid a new unique name (see also 5.5.4).

5.5 Development of Fluid-Specific Holdover Time Guidelines

5.5.1 New Fluids

A draft holdover time guideline is prepared for every fluid submitted for endurance time testing. For Type III fluids, draft holdover time guidelines are prepared for heated and/or unheated applications to correspond to the fluid manufacturer's intended use of the fluid (see 5.2).

The fluid manufacturer may request to see the fluid-specific holdover time guideline in advance and may decide not to have it published.

5.5.2 LOWV

LOWV values are associated with each fluid-specific holdover time guideline (one LOWV for each fluid concentration/dilution for which holdover times are provided). A fluid's LOWV is determined by the viscosity of the sample submitted for endurance time testing (see 3.3.1). Transport Canada and FAA publish the LOWV values in their holdover time guideline publications; currently LOWV values are provided in a table at the end of the holdover time guideline documents, not on individual fluid-specific holdover time guideline pages.

NOTE: Holdover time guidelines are valid only for fluids with viscosities equal to or greater than their published LOWV.

NOTE: The lower sales specification viscosity limit must be higher than the LOWV to allow for viscosity loss in fluid storage, handling and application.

5.5.3 HOTs for the "Below -14 °C to LOUT" Row (Type II/IV Fluids Only)

Due to the difficulty in obtaining test data at very cold temperatures (below -14 °C) in natural snow, the 2004-05 generic holdover time values (0:15 to 0:30) are used in the "below -14 to LOUT" snow cell in Type II and Type IV fluid-specific holdover time guidelines.

Testing with a number of Type II and Type IV fluids in freezing fog at -25 °C and -28.5 °C showed endurance times are similar at these temperatures and substantiated the use of LOUT as the lower limit of the coldest freezing fog temperature band for most Type II/IV fluids. Fluids with an LOUT of -29.5 °C or below require additional testing to substantiate the holdover times calculated from testing at -25 °C.

5.5.4 Fluid Retesting

If a new sample of a fluid with the same name is submitted for ARP5485 testing, even if it is submitted years after the earlier submission, the holdover time guidelines will be readjusted as follows:

- a. If the LOWV of the new sample is the same as the original sample, the lowest test data from the two samples shall be used to calculate the fluid-specific and generic holdover time guidelines.
- b. If the LOWV of the new sample is above the original sample, the fluid manufacturer shall have the choice of:
 1. selecting the lower original LOWV for the fluid-specific holdover time guideline in which case the lowest test data from the two samples shall be used to calculate the fluid-specific and generic holdover time guidelines or
 2. selecting the new higher LOWV for the fluid-specific holdover time guideline in which case the data from the earlier sample shall be eliminated from the fluid-specific and generic holdover time guidelines and the new sample shall be used to calculate revised fluid-specific and generic holdover time guidelines.

- c. If the LOWV of the new sample is below the original sample, the fluid manufacturer shall have the choice of:
1. selecting the new lower LOWV for the fluid-specific holdover time guideline in which case the lowest test data from the two samples shall be used to calculate the fluid-specific and generic holdover time guidelines or
 2. selecting the higher original LOWV for the fluid-specific holdover time guideline in which case the data from the new sample shall not be used and there shall be no change to the fluid-specific and generic holdover time guidelines.

Should several samples be submitted, the decision process described above shall be used to handle multiple samples. Every time a new sample is submitted, the starting point shall be the endurance time data used to calculate the then-effective fluid-specific holdover time guideline and the LOWV for that same fluid-specific holdover time guideline.

5.5.5 Addition of Fluid-Specific Holdover Time Guidelines for Licensee

Fluid manufacturers may obtain a license to produce or market another fluid manufacturer's fluid. In this situation, the licensee may request a separate fluid-specific holdover time guideline be published for the fluid under the licensee's brand name. The licensed fluid must use the same LOWV as the original fluid.

If the licensed fluid will be produced in a new location, the fluid manufacturer must demonstrate to Transport Canada and FAA that the fluid production method, materials and handling will produce product that is equivalent to the original product. This can be done by the licensee providing the following to Transport Canada and FAA or their designated delegate:

1. Results from aerodynamic testing on the licensee's manufactured fluid as described in AMS1428 §4.4.3 and §3.2.5 and AS5900.
2. Satisfactory results from a WSET as described in AMS1428 §3.2.4 and AS5901. Tests must be conducted with neat fluid, 75/25 diluted fluid and 50/50 diluted fluid unless there are restrictions on the use of the fluid in diluted form, in which case only the neat fluid must be tested.
3. A copy of the original certification test data and most recent site certificate (AMS1428 §4.4.3).

5.6 Development of Generic Holdover Time Guidelines

The term generic applies to holdover time guidelines comprised of the lowest holdover time performance (worst case) of all fluids separated by AMS1428 fluid type (II, III, or IV) under all conditions. The fluids included in the generic analyses are those on the Transport Canada and FAA published lists of fluids. The holdover times of these fluids (including both heated and unheated Type III fluid values) are compared on a cell-by-cell basis to determine the lowest holdover time values for each cell of the related generic holdover time table.

Three generic holdover time guidelines are prepared: one for Type II fluid, one for Type III fluid, and one for Type IV fluid.

5.6.1 Inclusion of Type IV Fluids in Type II Generic Analysis

All Type IV fluids also qualify as Type II fluids (Type II fluids do not qualify as Type IV fluids). Although Type IV fluids are generally expected to exhibit superior endurance time performance over Type II fluids, this may not always be the case with every fluid in every holdover time guideline cell. Therefore, all Type IV fluids must be included in the Type II generic analysis.

5.7 Obligation of Fluid Manufacturers to Provide Information to Transport Canada/FAA

In order for a fluid to be considered for inclusion in the Transport Canada and FAA Holdover Time Guidelines, the fluid manufacturer must provide Transport Canada and FAA or their designated delegate with the information described in 5.7.1, 5.7.2, and 5.7.3 according to the frequency and timing described in each subsection. Transport Canada and FAA have the prerogative to exclude fluids from their holdover time guidelines publications for which information is not provided by the stated deadlines.