FAA
HOLDOVER TIME GUIDELINES

WINTER 2023-2024
ORIGINAL ISSUE: AUGUST 2, 2023

The information contained in this document serves as the official FAA guidance, Holdover Times and Allowance Times for use during the 2023-2024 winter season.

Questions concerning FAA aircraft ground de/anti-icing requirements or Flight Standards policies should be addressed to charles.j.enders@faa.gov or 202-267-4557.

Questions on the technical content of the holdover time tables should be addressed to warren.underwood@faa.gov or 404-305-7267.

Questions regarding editorial content or web access issues should be addressed to sung.shin@faa.gov or 202-267-8086.

The Holdover Times Tables and related information can be found at the FAA's Aircraft Ground Deicing website. To receive notifications on updates to the Holdover Times Tables and related information, subscribe to the Aircraft Ground Deicing website by clicking on this link.

This document is intended to be used in conjunction with the FAA Ground Deicing Program General Information Document, Winter 2023-2024, located on the FAA's Aircraft Ground Deicing website.

CHANGE CONTROL RECORDS

This page indicates any changes made to individual pages within the document. Changed pages have the appropriate revision date in the footer. Sidebars are shown to assist in identifying where significant changes have been made on these pages.

It is the responsibility of the end user to periodically check the following website for updates:
https://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/deicing/.

REVISION	*DATE*	*DESCRIPTION OF CHANGES*	*AFFECTED PAGES*	*AUTHOR*

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HOW TO USE THIS DOCUMENT

Complementary Documents

This document is designed to be used in conjunction with the FAA N 8900 series notice "Revised FAA-Approved Deicing Program Updates, Winter 2023-2024." The two documents complement each other and should be used together for a thorough understanding of the subject matter.

Beginning in the winter of 2021-22, the FAA has published an annual database of degree-specific holdover times (DSHOTs) for snow and snow-related precipitation conditions (including snow, snow grains, and snow pellets). The DSHOT database contains an expanded set of snow precipitation HOTs for all undiluted Type II, III and IV anti-icing fluids listed in the FAA HOT Guidelines. This database can be found at the following website: https://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/deicing/.
Guidance and conditions on the use of DSHOT data can be found in the FAA N 8900 series notice "Revised FAA-Approved Deicing Program Updates, Winter 2023-2024".

Applicability

A new version of this document is published for each winter operating season, typically in early August preceding the winter operating season. Updates to the winter's document may be published at any time after the Original Issue document is published. When a new document is published, either mid-season or each new season, the previous document becomes obsolete. It is the responsibility of the end user to periodically check for document updates on the following website:
https://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/deicing/.

Main Document Structure and Content

This document is divided into several sections.

- Change Control Records: Provides details of any changes made to the document in mid-season document updates.
- Table of Contents: Provides a list of sections, tables, and appendices in the document.
- How to Use This Document: Provides top-level guidance on how to use the document.
- Highlights and Changes for Winter 2023-2024: Describes key changes made to the document for the current winter operating season.
- Holdover Time Guidelines: Series of tables that provide estimated holdover times (in hh:mm). Fluids are divided by fluid type (Type I, II, III, and IV), aircraft construction materials (Type I only), fluid brand (Type II, III, IV), aircraft rotation speed (Type III only), and fluid application temperature (Type III only). Columns in the tables divide the information by precipitation type; rows in the tables divide the information by temperature and fluid dilution. Notes in the tables refer to additional information on the specific HOTs. Cautions that apply to all tables in a section are located on the flysheets before each section.
- Allowance Times Tables: Tables that provide allowance times (in minutes) for Type III and Type IV fluids. Rows in the tables divide the information by precipitation type; columns in the tables divide the information by temperature. Notes in the tables refer to additional information on the specific allowance times. Cautions that apply to all allowance times tables are located on the flysheet before the section.
- Supplementary Guidance: Series of tables that provide supplementary information for using the holdover time guidelines and allowance times tables. Includes a table for estimating snowfall intensity from prevailing visibility, tables of fluid information (one table per fluid type), and tables of fluid application guidance (by fluid type).

Appendices

The appendices contain complementary content.

- Appendix A: Provides adjusted holdover time guidelines (holdover time guidelines and allowance times tables) for operations when flaps and slats are deployed prior to de/anti-icing.
- Appendix B: Provides information on laboratories involved in testing de/anti-icing fluids.
- Appendix C: Provides the latest de/anti-icing fluid manufacturer contact information at the time of publication.

HIGHLIGHTS AND CHANGES FOR WINTER 2023-2024

CHANGED FROM PREVIOUS YEAR

The principal changes from the previous year are briefly indicated herein.

How to Use this Document

- A bullet has been added to the Appendices section describing the purpose of the new Appendix C “Aircraft Deicing Fluid (ADF)/Aircraft Anti-icing Fluid (AAF) Manufacturers”.

Holdover Time Tables

- Fluid specific HOT guidelines have been created for one new fluid: ALAB International PROFLIGHT EG4 (Type IV).
- The HOT guidelines for Newave Aerochemical FCY-2 Bio+ (Type II), Clariant Max Flight 04 (Type IV), JSC RCP Nordix Defrost EG 4 (Type IV), and Shaanxi Cleanway Cleansurface IV (Type IV) have been removed.
- An increase has been made to the Type II generic holdover times in natural snow as a result of the removed fluid.
- Several increases have been made to the Type IV generic holdover times as a result of removed fluids.
- Increases have been made to some of the Type II and Type IV Generic HOTs in the Snow mixed with Freezing Fog HOT table as a result of removed fluids.
- A note was modified in all Type I, II, III, and IV HOT tables indicating that the visibility table must be used in conditions of very light or light snow mixed with rain or drizzle in order to confirm the snowfall intensity.
- A note was added to the Active Frost and Snow mixed with Freezing Fog generic tables indicating that the fluid being used must be listed in the list of fluids (Table 51 - Table 54) in order to use the generic HOTs.
- A caution was added for all Type IV fluids indicating that the HOT tables are for use with aircraft conforming to the SAE AS5900 high speed aerodynamic test criterion.

Allowance Times Tables

- The condition Light Ice Pellets Mixed with Light Drizzle or Moderate Drizzle has been added to all allowance times tables and uses the same allowance time as Light Ice Pellets Mixed with Light Freezing Drizzle or Moderate Freezing Drizzle. An accompanying note was added to indicate that its use is limited to above 0°C.
- The condition Moderate Ice Pellets (or Small Hail) Mixed with Moderate Drizzle has been added to all Type IV allowance times tables. This condition uses the same allowance times as Moderate Ice Pellets (or Small Hail) Mixed with Moderate Freezing Drizzle. An accompanying note was added to indicate that its use is limited to above 0°C.
- Degrees Fahrenheit has been added to the temperature row in all allowance times tables.
- Spaces were added to the mixed conditions METAR codes to more accurately reflect what is reported.

Supplemental Guidance

- A note has been added to The Snowfall Intensities as a Function of Prevailing Visibility table to indicate that when snowfall is combined with an obscuration the visibility table may overestimate the actual snowfall intensity. However, the ASOS from the FMH-1 may underestimate the actual snowfall intensity therefore the use of the visibility table is always recommended
- The list of fluids has been updated to include highest on-wing viscosity (HOWV) data for all thickened fluids, notes relating to viscosity have been updated.

- The list of fluids (Tables 54, 55, 56 and 57) has been updated to reflect the latest information available on all de/anti-icing fluids.

UNCHANGED FROM PREVIOUS YEAR

Supplemental Guidance

- The fluid application tables are unchanged.

ACTIVE FROST HOLDOVER TIME (HOT) GUIDELINES
WINTER 2023-2024

The HOT Guidelines are provided for information and guidance purposes. The HOT Guidelines on their own do not change, create, amend or permit deviations from regulatory requirements.

The HOT Guidelines may use mandatory terms such as “must”, “shall” and “is/are required” so as to convey the intent of meeting regulatory requirements and SAE Standards, where applicable. The term “should” is to be understood, unless an alternative method of achieving safety is implemented that would meet or exceed the intent of the recommendation.

CAUTIONS

- The responsibility for the application of these data remains with the user.
- Fluids used during ground de/anti-icing do not provide in-flight icing protection.
- This table is for departure planning only and should be used in conjunction with pretakeoff check procedures

TABLE 1: ACTIVE FROST HOLDOVER TIMES FOR SAE TYPE I, TYPE II, TYPE III, AND TYPE IV FLUIDS[1]

Outside Air Temperature[2,3,4]	Type I
-1 °C and above (30 °F and above)	0:45 *(0:35)*[6]
below -1 to -3 °C (below 30 to 27 °F)	
below -3 to -10 °C (below 27 to 14 °F)	
below -10 to -14 °C (below 14 to 7 °F)	
below -14 to -21 °C (below 7 to -6 °F)	
below -21 to -25 °C (below -6 to -13 °F)	
below -25 °C to LOUT (below -13 °F to LOUT)	

Outside Air Temperature[3,4]	Concentration Fluid/Water By % Volume	Type II	Type III[5]	Type IV
-1 °C and above (30 °F and above)	100/0	8:00	2:00	12:00
	75/25	5:00	1:00	5:00
	50/50	2:00	0:30	3:00
below -1 to -3 °C (below 30 to 27 °F)	100/0	8:00	2:00	12:00
	75/25	5:00	1:00	5:00
	50/50	1:30	0:30	3:00
below -3 to -10 °C (below 27 to 14 °F)	100/0	8:00	2:00	10:00
	75/25	4:00	1:00	5:00
below -10 to -14 °C (below 14 to 7 °F)	100/0	6:00	2:00	6:00
	75/25	1:00	1:00	1:00
below -14 to -21 °C (below 7 to -6 °F)	100/0	3:00	2:00	6:00
below -21 to -25 °C (below -6 to -13 °F)	100/0	2:00	2:00	4:00
below -25 °C (below -13 °F)	100/0	No Holdover Time Guidelines Exist		

NOTES

1 To use the HOTs in this table, ensure that the fluid and dilution being used is listed in the List of Qualified Fluids Tested for Anti-Icing Performance and Aerodynamic Acceptance table (Table 51 - Table 54). Any restrictions on the use of the fluid have to be identified and applied.
2 Type I Fluid / Water Mixture must be selected so that the freezing point of the mixture is at least 10 °C (18 °F) below outside air temperature.
3 Ensure that the lowest operational use temperature (LOUT) is respected.
4 Changes in outside air temperature (OAT) over the course of longer frost events can be significant; the appropriate holdover time to use is the one provided for the coldest OAT that has occurred in the time between the de/anti-icing fluid application and takeoff.
5 To use the Type III fluid frost holdover times, the fluid brand being used must be known. AllClear AeroClear MAX must be applied unheated.
6 Value in parentheses is for aircraft with critical surfaces that are predominantly or entirely constructed of composite materials.

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 8.

HOT GUIDELINES FOR SAE TYPE I FLUIDS
WINTER 2023-2024

The HOT Guidelines are provided for information and guidance purposes. The HOT Guidelines on their own do not change, create, amend or permit deviations from regulatory requirements.

The HOT Guidelines may use mandatory terms such as “must”, “shall” and “is/are required” so as to convey the intent of meeting regulatory requirements and SAE Standards, where applicable. The term “should” is to be understood, unless an alternative method of achieving safety is implemented that would meet or exceed the intent of the recommendation.

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The time of protection will be shortened in heavy weather conditions. Heavy precipitation rates or high moisture content, high wind velocity, or jet blast may reduce holdover time below the lowest time stated in the range. Holdover time may be reduced when aircraft skin temperature is lower than outside air temperature.
- Fluids used during ground de/anti-icing do not provide in-flight icing protection.
- This table is for departure planning only and should be used in conjunction with pretakeoff check procedures

TABLE 2: HOLDOVER TIMES FOR SAE TYPE I FLUID ON CRITICAL AIRCRAFT SURFACES COMPOSED PREDOMINANTLY OF ALUMINUM

Outside Air Temperature[1,2]	Freezing Fog, Freezing Mist[3], or Ice Crystals[4]	Very Light Snow, Snow Grains or Snow Pellets[5,6,7]	Light Snow, Snow Grains or Snow Pellets[5,6,7]	Moderate Snow, Snow Grains or Snow Pellets[5,7]	Freezing Drizzle[8]	Light Freezing Rain	Rain on Cold-Soaked Wing[9]	Other[10]
-3 °C and above (27 °F and above)	0:11 - 0:17	0:18 - 0:22	0:11 - 0:18	0:06 - 0:11	0:09 - 0:13	0:02 - 0:05	0:02 - 0:05	
below -3 to -6 °C (below 27 to 21 °F)	0:08 - 0:13	0:14 - 0:17	0:08 - 0:14	0:05 - 0:08	0:05 - 0:09	0:02 - 0:05	CAUTION: No holdover time guidelines exist	
below -6 to -10 °C (below 21 to 14 °F)	0:06 - 0:10	0:11 - 0:13	0:06 - 0:11	0:04 - 0:06	0:04 - 0:07	0:02 - 0:05		
below -10 °C (below 14 °F)	0:05 - 0:09	0:07 - 0:08	0:04 - 0:07	0:02 - 0:04				

NOTES

1 Type I fluid / water mixture must be selected so that the freezing point of the mixture is at least 10 °C (18 °F) below outside air temperature.
2 Ensure that the lowest operational use temperature (LOUT) is respected.
3 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
4 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
5 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
6 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
7 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
8 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
9 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
10 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 10.

TABLE 3: HOLDOVER TIMES FOR SAE TYPE I FLUID ON CRITICAL AIRCRAFT SURFACES COMPOSED PREDOMINANTLY OF COMPOSITES

Outside Air Temperature[1,2]	Freezing Fog, Freezing Mist[3], or Ice Crystals[4]	Very Light Snow, Snow Grains or Snow Pellets[5,6,7]	Light Snow, Snow Grains or Snow Pellets[5,6,7]	Moderate Snow, Snow Grains or Snow Pellets[5,7]	Freezing Drizzle[8]	Light Freezing Rain	Rain on Cold-Soaked Wing[9]	Other[10]
-3 °C and above (27 °F and above)	0:09 - 0:16	0:12 - 0:15	0:06 - 0:12	0:03 - 0:06	0:08 - 0:13	0:02 - 0:05	0:01 - 0:05	
below -3 to -6 °C (below 27 to 21 °F)	0:06 - 0:08	0:11 - 0:13	0:05 - 0:11	0:02 - 0:05	0:05 - 0:09	0:02 - 0:05	CAUTION: No holdover time guidelines exist	
below -6 to -10 °C (below 21 to 14 °F)	0:04 - 0:08	0:09 - 0:12	0:05 - 0:09	0:02 - 0:05	0:04 - 0:07	0:02 - 0:05		
below -10 °C (below 14 °F)	0:04 - 0:07	0:07 - 0:08	0:04 - 0:07	0:02 - 0:04				

NOTES

1 Type I fluid / water mixture must be selected so that the freezing point of the mixture is at least 10 °C (18 °F) below outside air temperature.
2 Ensure that the lowest operational use temperature (LOUT) is respected.
3 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
4 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
5 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
6 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
7 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
8 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
9 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
10 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 10.

HOT GUIDELINES FOR SAE TYPE II FLUIDS
WINTER 2023-2024

The HOT Guidelines are provided for information and guidance purposes. The HOT Guidelines on their own do not change, create, amend or permit deviations from regulatory requirements.

The HOT Guidelines may use mandatory terms such as “must”, “shall” and “is/are required” so as to convey the intent of meeting regulatory requirements and SAE Standards, where applicable. The term “should” is to be understood, unless an alternative method of achieving safety is implemented that would meet or exceed the intent of the recommendation.

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The time of protection will be shortened in heavy weather conditions. Heavy precipitation rates or high moisture content, high wind velocity, or jet blast may reduce holdover time below the lowest time stated in the range. Holdover time may be reduced when aircraft skin temperature is lower than outside air temperature.
- Fluids used during ground de/anti-icing do not provide in-flight icing protection.
- This table is for departure planning only and should be used in conjunction with pretakeoff check procedures

TABLE 4: GENERIC HOLDOVER TIMES FOR SAE TYPE II FLUIDS[1]

Outside Air Temperature[2]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[3], or Ice Crystals[4]	Snow, Snow Grains or Snow Pellets[5,6,7]	Freezing Drizzle[8]	Light Freezing Rain	Rain on Cold-Soaked Wing[9]	Other[10]
-3 °C and above (27 °F and above)	100/0	0:55 - 1:50	0:30 - 0:55	0:30 - 1:00	0:20 - 0:35	0:07 - 0:45	
	75/25	0:40 - 1:10	0:15 - 0:30	0:25 - 0:40	0:15 - 0:25	0:04 - 0:25	
	50/50	0:15 - 0:30	0:07 - 0:15	0:09 - 0:15	0:06 - 0:09	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:30 - 0:45	0:20 - 0:40	0:20 - 0:45	0:15 - 0:20		
	75/25	0:25 - 0:55	0:10 - 0:25	0:15 - 0:30	0:08 - 0:15		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:30 - 0:45	0:15 - 0:30	0:20 - 0:45[11]	0:15 - 0:20[11]		
	75/25	0:25 - 0:55	0:09 - 0:20	0:15 - 0:30[11]	0:08 - 0:15[11]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:15 - 0:20	0:02 - 0:07				
below -18 to -25 °C[12] (below 0 to -13 °F)	100/0	0:15 - 0:20	0:01 - 0:03				
below -25 °C to LOUT[12] (below -13 °F to LOUT)	100/0	0:15 - 0:20	0:00 - 0:01				

NOTES

1 To use the HOTs in this table, ensure that the fluid and dilution being used is listed in the Type II Fluids Tested for Anti-Icing Performance and Aerodynamic Acceptance table (Table 52). Any restrictions on the use of the fluid have to be identified and applied.
2 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
3 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
4 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
5 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
6 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
7 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
8 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
9 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
10 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
11 No holdover time guidelines exist for this condition below -10 °C (14 °F).
12 If the LOUT is unknown, no holdover time guidelines exist below -25 °C (-13 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 13.

TABLE 5: TYPE II HOLDOVER TIMES FOR ABAX ECOWING AD-2

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:20 - 3:00	2:25 - 2:55	1:15 - 2:25	0:40 - 1:15	0:40 - 1:40	0:30 - 0:45	0:09 - 1:25	
	75/25	1:15 - 1:25	1:45 - 2:10	0:55 - 1:45	0:25 - 0:55	0:35 - 1:05	0:20 - 0:30	0:04 - 0:50	
	50/50	0:15 - 0:30	0:35 - 0:40	0:15 - 0:35	0:07 - 0:15	0:09 - 0:15	0:06 - 0:09	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:45 - 2:30	2:00 - 2:25	1:00 - 2:00	0:30 - 1:00	0:25 - 1:10	0:20 - 0:30		
	75/25	0:35 - 1:55	1:40 - 2:05	0:50 - 1:40	0:25 - 0:50	0:15 - 0:55	0:20 - 0:35		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:45 - 2:30	1:45 - 2:05	0:55 - 1:45	0:30 - 0:55	0:25 - 1:10[10]	0:20 - 0:30[10]		
	75/25	0:35 - 1:55	1:35 - 2:00	0:50 - 1:35	0:25 - 0:50	0:15 - 0:55[10]	0:20 - 0:35[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:15 - 0:40	0:20 - 0:30	0:07 - 0:20	0:02 - 0:07				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:15 - 0:40	0:09 - 0:15	0:03 - 0:09	0:01 - 0:03				
below -25 to -27 °C (below -13 to -17 °F)	100/0	0:15 - 0:40	0:05 - 0:07	0:01 - 0:05	0:00 - 0:01				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 13.

TABLE 6: TYPE II HOLDOVER TIMES FOR AVIATION XI'AN HIGH-TECH CLEANWING II

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	0:55 - 1:50	1:35 - 1:55	0:55 - 1:35	0:30 - 0:55	0:35 - 1:05	0:25 - 0:35	0:10 - 0:55	
	75/25	0:50 - 1:20	1:20 - 1:40	0:45 - 1:20	0:25 - 0:45	0:35 - 1:00	0:20 - 0:30	0:07 - 0:50	
	50/50	0:35 - 1:00	0:50 - 1:05	0:25 - 0:50	0:15 - 0:25	0:20 - 0:40	0:10 - 0:20	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:45 - 1:50	1:20 - 1:35	0:40 - 1:20	0:25 - 0:40	0:30 - 0:55	0:20 - 0:25		
	75/25	0:40 - 1:45	1:20 - 1:35	0:45 - 1:20	0:25 - 0:45	0:35 - 0:40	0:20 - 0:25		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:45 - 1:50	1:05 - 1:20	0:35 - 1:05	0:20 - 0:35	0:30 - 0:55[10]	0:20 - 0:25[10]		
	75/25	0:40 - 1:45	1:20 - 1:35	0:45 - 1:20	0:25 - 0:45	0:35 - 0:40[10]	0:20 - 0:25[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:20 - 0:50	0:45 - 1:00	0:25 - 0:45	0:15 - 0:25				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:20 - 0:50	0:30 - 0:35	0:15 - 0:30	0:07 - 0:15				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than "light". No holdover times exist if the reported visibility correlates to a "moderate" or "heavy" precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 13.

TABLE 7: TYPE II HOLDOVER TIMES FOR CLARIANT SAFEWING MP II FLIGHT

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	3:30 - 4:00	2:35 - 3:00	1:35 - 2:35	1:00 - 1:35	1:20 - 2:00	0:45 - 1:25	0:10 - 1:30	
	75/25	1:50 - 2:45	2:35 - 3:00	1:20 - 2:35	0:40 - 1:20	1:10 - 1:30	0:30 - 0:55	0:06 - 0:50	
	50/50	0:55 - 1:45	0:45 - 0:55	0:25 - 0:45	0:10 - 0:25	0:20 - 0:30	0:10 - 0:15	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:55 - 1:45	2:05 - 2:30	1:15 - 2:05	0:45 - 1:15	0:35 - 1:30	0:25 - 0:45		
	75/25	0:25 - 1:05	1:45 - 2:10	0:55 - 1:45	0:30 - 0:55	0:25 - 1:10	0:20 - 0:35		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:55 - 1:45	1:50 - 2:10	1:05 - 1:50	0:40 - 1:05	0:35 - 1:30[10]	0:25 - 0:45[10]		
	75/25	0:25 - 1:05	1:20 - 1:40	0:40 - 1:20	0:20 - 0:40	0:25 - 1:10[10]	0:20 - 0:35[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:30 - 0:50	1:10 - 1:40	0:25 - 1:10	0:08 - 0:25				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:30 - 0:50	0:30 - 0:40	0:10 - 0:30	0:03 - 0:10				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:30 - 0:50	0:20 - 0:30	0:07 - 0:20	0:02 - 0:07				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 13.

TABLE 8: TYPE II HOLDOVER TIMES FOR CLARIANT SAFEWING MP II FLIGHT PLUS

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Snow, Snow Grains or Snow Pellets[4,5,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:40 - 4:00	0:50 - 1:50	1:25 - 2:00	0:45 - 1:00	0:15 - 2:00	
	75/25	2:35 - 4:00	1:00 - 1:45	1:35 - 2:00	0:50 - 1:15	0:15 - 1:15	
	50/50	1:05 - 2:20	0:15 - 0:25	0:30 - 1:05	0:15 - 0:20	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:40 - 2:20	0:40 - 1:30	0:35 - 1:25	0:35 - 0:55		
	75/25	0:30 - 1:45	1:00 - 1:40	0:25 - 1:10	0:30 - 0:45		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:40 - 2:20	0:35 - 1:15	0:35 - 1:25[10]	0:35 - 0:55[10]		
	75/25	0:30 - 1:45	0:55 - 1:40	0:25 - 1:10[10]	0:30 - 0:45[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:20 - 0:40	0:02 - 0:07				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:20 - 0:40	0:01 - 0:03				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:20 - 0:40	0:00 - 0:01				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 13.

TABLE 9: TYPE II HOLDOVER TIMES FOR CRYOTECH POLAR GUARD® II

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:50 - 4:00	3:00 - 3:00	1:55 - 3:00	1:05 - 1:55	1:35 - 2:00	1:15 - 1:30	0:15 - 2:00	
	75/25	2:30 - 4:00	3:00 - 3:00	1:25 - 3:00	0:40 - 1:25	1:40 - 2:00	0:40 - 1:10	0:09 - 1:40	
	50/50	0:50 - 1:25	1:10 - 1:35	0:25 - 1:10	0:10 - 0:25	0:20 - 0:45	0:09 - 0:20	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:55 - 2:30	2:25 - 2:50	1:25 - 2:25	0:50 - 1:25	0:35 - 1:35	0:35 - 0:45		
	75/25	0:40 - 1:30	2:20 - 3:00	1:05 - 2:20	0:30 - 1:05	0:25 - 1:05	0:35 - 0:45		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:55 - 2:30	2:00 - 2:20	1:10 - 2:00	0:40 - 1:10	0:35 - 1:35[10]	0:35 - 0:45[10]		
	75/25	0:40 - 1:30	2:00 - 2:30	0:55 - 2:00	0:25 - 0:55	0:25 - 1:05[10]	0:35 - 0:45[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:25 - 0:50	1:35 - 2:15	0:35 - 1:35	0:10 - 0:35				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:25 - 0:50	0:40 - 0:55	0:15 - 0:40	0:04 - 0:15				
below -25 to -30.5 °C (below -13 to -23 °F)	100/0	0:25 - 0:50	0:25 - 0:30	0:07 - 0:25	0:02 - 0:07				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 13.

TABLE 10: TYPE II HOLDOVER TIMES FOR JSC RCP NORDIX DEFROST PG 2

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	0:55 - 1:50	1:50 - 2:15	0:55 - 1:50	0:30 - 0:55	0:30 - 1:00	0:20 - 0:35	0:10 - 1:20	
	75/25	1:05 - 2:00	1:45 - 2:15	0:45 - 1:45	0:20 - 0:45	0:25 - 0:50	0:15 - 0:30	0:06 - 0:35	
	50/50	1:00 - 1:50	2:10 - 2:40	1:00 - 2:10	0:30 - 1:00	0:30 - 0:50	0:15 - 0:30	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:55 - 1:25	1:25 - 1:45	0:45 - 1:25	0:25 - 0:45	0:35 - 0:50	0:20 - 0:30		
	75/25	0:40 - 1:20	1:10 - 1:30	0:30 - 1:10	0:15 - 0:30	0:25 - 0:40	0:15 - 0:20		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:55 - 1:25	1:15 - 1:30	0:40 - 1:15	0:20 - 0:40	0:35 - 0:50[10]	0:20 - 0:30[10]		
	75/25	0:40 - 1:20	0:55 - 1:05	0:25 - 0:55	0:10 - 0:25	0:25 - 0:40[10]	0:15 - 0:20[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:35 - 1:05	0:20 - 0:30	0:07 - 0:20	0:02 - 0:07				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:35 - 1:05	0:09 - 0:15	0:03 - 0:09	0:01 - 0:03				
below -25 to -27 °C (below -13 to -17 °F)	100/0	0:35 - 1:05	0:05 - 0:07	0:01 - 0:05	0:00 - 0:01				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 13.

TABLE 11: TYPE II HOLDOVER TIMES FOR KILFROST ABC-K PLUS

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Snow, Snow Grains or Snow Pellets[4,5,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:15 - 3:45	1:00 - 1:40	1:50 - 2:00	1:00 - 1:25	0:20 - 2:00	
	75/25	1:40 - 2:30	0:35 - 1:10	1:25 - 2:00	0:50 - 1:10	0:15 - 2:00	
	50/50	0:35 - 1:05	0:07 - 0:15	0:20 - 0:30	0:10 - 0:15	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:30 - 1:05	0:55 - 1:30	0:25 - 1:00	0:15 - 0:35		
	75/25	0:25 - 1:25	0:35 - 1:05	0:20 - 0:55	0:09 - 0:30		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:30 - 1:05	0:50 - 1:25	0:25 - 1:00[10]	0:15 - 0:35[10]		
	75/25	0:25 - 1:25	0:35 - 1:05	0:20 - 0:55[10]	0:09 - 0:30[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:30 - 0:55	0:02 - 0:07				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:30 - 0:55	0:01 - 0:03				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:30 - 0:55	0:00 - 0:01				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 13.

TABLE 12: TYPE II HOLDOVER TIMES FOR KILFROST ICE CLEAR II

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:25 - 2:25	2:25 - 2:55	1:20 - 2:25	0:40 - 1:20	1:00 - 1:35	0:40 - 1:05	0:15 - 2:00	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A		
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:05 - 2:35	2:10 - 2:35	1:10 - 2:10	0:40 - 1:10	0:30 - 1:15	0:35 - 0:55		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:05 - 2:35	2:00 - 2:25	1:05 - 2:00	0:35 - 1:05	0:30 - 1:15[10]	0:35 - 0:55[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:35 - 0:45	0:55 - 1:05	0:30 - 0:55	0:15 - 0:30				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:35 - 0:45	0:30 - 0:35	0:15 - 0:30	0:08 - 0:15				
below -25 to -28 °C (below -13 to -18 °F)	100/0	0:35 - 0:45	0:25 - 0:30	0:10 - 0:25	0:06 - 0:10				

CAUTION: No holdover time guidelines exist

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 13.

TABLE 13: TYPE II HOLDOVER TIMES FOR MKS DEVO COREICEPHOB TYPE II

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3°C and above (27°F and above)	100/0	1:55 - 2:45	2:35 - 3:00	1:25 - 2:35	0:45 - 1:25	1:15 - 2:00	0:45 - 1:10	0:15 - 1:35	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	1:05 - 1:45	1:45 - 2:05	1:00 - 1:45	0:35 - 1:00	0:50 - 1:15	0:25 - 0:40	CAUTION: No holdover time guidelines exist	
below -3 to -8°C (below 27 to 18°F)	100/0	0:55 - 1:55	1:50 - 2:15	1:00 - 1:50	0:30 - 1:00	0:30 - 1:10	0:25 - 0:35		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14°C (below 18 to 7°F)	100/0	0:55 - 1:55	1:30 - 1:50	0:50 - 1:30	0:25 - 0:50	0:30 - 1:10[10]	0:25 - 0:35[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18°C (below 7 to 0°F)	100/0	0:20 - 0:30	0:35 - 0:40	0:20 - 0:35	0:10 - 0:20				
below -18 to -25°C (below 0 to -13°F)	100/0	0:20 - 0:30	0:15 - 0:15	0:07 - 0:15	0:04 - 0:07				
below -25 to -27°C (below -13 to -17°F)	100/0	0:20 - 0:30	0:10 - 0:10	0:05 - 0:10	0:03 - 0:05				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 13.

TABLE 14: TYPE II HOLDOVER TIMES FOR NEWAVE AEROCHEMICAL FCY-2

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Snow, Snow Grains or Snow Pellets[4,5,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:15 - 2:25	0:30 - 0:55	0:35 - 1:05	0:25 - 0:35	0:08 - 0:45	
	75/25	0:50 - 1:30	0:20 - 0:40	0:25 - 0:45	0:15 - 0:25	0:05 - 0:25	
	50/50	0:25 - 0:35	0:15 - 0:25	0:10 - 0:20	0:07 - 0:10	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:45 - 1:30	0:20 - 0:40	0:20 - 0:45	0:15 - 0:20		
	75/25	0:30 - 1:05	0:15 - 0:25	0:15 - 0:30	0:08 - 0:15		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:45 - 1:30	0:15 - 0:30	0:20 - 0:45[10]	0:15 - 0:20[10]		
	75/25	0:30 - 1:05	0:10 - 0:20	0:15 - 0:30[10]	0:08 - 0:15[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:25 - 0:35	0:02 - 0:07				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:25 - 0:35	0:01 - 0:03				
below -25 to -28 °C (below -13 to -18 °F)	100/0	0:25 - 0:35	0:00 - 0:01				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 13.

TABLE 15: TYPE II HOLDOVER TIMES FOR ROMCHIM ADD-PROTECT NG TYPE II

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:10 - 2:25	2:35 - 3:00	1:10 - 2:35	0:35 - 1:10	0:50 - 1:20	0:35 - 0:50	0:07 - 1:10	
	75/25	1:00 - 1:50	1:55 - 2:25	0:55 - 1:55	0:25 - 0:55	0:40 - 1:15	0:25 - 0:40	0:07 - 0:55	
	50/50	0:25 - 0:55	0:55 - 1:05	0:30 - 0:55	0:15 - 0:30	0:20 - 0:35	0:10 - 0:20	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:55 - 1:35	1:50 - 2:20	0:50 - 1:50	0:25 - 0:50	0:35 - 1:10	0:25 - 0:35		
	75/25	0:55 - 1:25	1:25 - 1:45	0:40 - 1:25	0:20 - 0:40	0:25 - 1:05	0:20 - 0:30		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:55 - 1:35	1:25 - 1:50	0:40 - 1:25	0:20 - 0:40	0:35 - 1:10[10]	0:25 - 0:35[10]		
	75/25	0:55 - 1:25	1:05 - 1:25	0:30 - 1:05	0:15 - 0:30	0:25 - 1:05[10]	0:20 - 0:30[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:15 - 0:20	0:20 - 0:30	0:07 - 0:20	0:02 - 0:07				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:15 - 0:20	0:09 - 0:15	0:03 - 0:09	0:01 - 0:03				
below -25 to -28 °C (below -13 to -18 °F)	100/0	0:15 - 0:20	0:05 - 0:07	0:01 - 0:05	0:00 - 0:01				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 13.

TABLE 16: TYPE II HOLDOVER TIMES FOR ROMCHIM ADD-PROTECT TYPE II

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:40 - 3:30	1:55 - 2:25	1:00 - 1:55	0:30 - 1:00	0:40 - 1:35	0:25 - 0:45	0:09 - 0:50	
	75/25	0:40 - 1:10	1:00 - 1:10	0:30 - 1:00	0:15 - 0:30	0:25 - 0:40	0:15 - 0:25	0:05 - 0:25	
	50/50	0:20 - 0:35	0:30 - 0:35	0:15 - 0:30	0:09 - 0:15	0:10 - 0:30	0:08 - 0:10	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:30 - 0:45	1:20 - 1:40	0:40 - 1:20	0:20 - 0:40	0:25 - 0:50	0:20 - 0:30		
	75/25	0:30 - 0:55	0:40 - 0:50	0:25 - 0:40	0:10 - 0:25	0:20 - 0:30	0:15 - 0:20		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:30 - 0:45	1:05 - 1:20	0:35 - 1:05	0:15 - 0:35	0:25 - 0:50[10]	0:20 - 0:30[10]		
	75/25	0:30 - 0:55	0:35 - 0:40	0:20 - 0:35	0:09 - 0:20	0:20 - 0:30[10]	0:15 - 0:20[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:15 - 0:25	0:20 - 0:30	0:07 - 0:20	0:02 - 0:07				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:15 - 0:25	0:09 - 0:15	0:03 - 0:09	0:01 - 0:03				
below -25 to -28 °C (below -13 to -18 °F)	100/0	0:15 - 0:25	0:05 - 0:07	0:01 - 0:05	0:00 - 0:01				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 13.

HOT GUIDELINES FOR SAE TYPE III FLUIDS
WINTER 2023-2024

The HOT Guidelines are provided for information and guidance purposes. The HOT Guidelines on their own do not change, create, amend or permit deviations from regulatory requirements.

The HOT Guidelines may use mandatory terms such as “must”, “shall” and “is/are required” so as to convey the intent of meeting regulatory requirements and SAE Standards, where applicable. The term “should” is to be understood, unless an alternative method of achieving safety is implemented that would meet or exceed the intent of the recommendation.

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The time of protection will be shortened in heavy weather conditions. Heavy precipitation rates or high moisture content, high wind velocity, or jet blast may reduce holdover time below the lowest time stated in the range. Holdover time may be reduced when aircraft skin temperature is lower than outside air temperature.
- Fluids used during ground de/anti-icing do not provide in-flight icing protection.
- This table is for departure planning only and should be used in conjunction with pretakeoff check procedures

TABLE 17: TYPE III HOLDOVER TIMES FOR ALLCLEAR AEROCLEAR MAX APPLIED UNHEATED ON LOW SPEED AIRCRAFT[1]

Outside Air Temperature[2]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[3], or Ice Crystals[4]	Very Light Snow, Snow Grains or Snow Pellets[5,6,7]	Light Snow, Snow Grains or Snow Pellets[5,6,7]	Moderate Snow, Snow Grains or Snow Pellets[5,7]	Freezing Drizzle[8]	Light Freezing Rain	Rain on Cold-Soaked Wing[9]	Other[10]
-3 °C and above (27 °F and above)	100/0	0:45 - 1:55	1:20 - 1:45	0:40 - 1:20	0:18 - 0:40	0:25 - 0:50	0:14 - 0:25	0:05 - 0:40	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -10 °C (below 27 to 14 °F)	100/0	0:50 - 1:40	1:20 - 1:45	0:40 - 1:20	0:18 - 0:40	0:25 - 0:45	0:15 - 0:25		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -10 to -16 °C (below 14 to 3 °F)	100/0	0:40 - 1:45	1:20 - 1:45	0:40 - 1:20	0:18 - 0:40				

NOTES

1 These holdover times are for aircraft conforming to the SAE AS5900 low speed aerodynamic test criterion. Fluid must be applied unheated to use these holdover times. No holdover times exist for this fluid applied heated. If uncertain whether the aircraft conforms to the low, middle, or high speed aerodynamic test criterion, no holdover time guidelines exist below -16°C (3°F).
2 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type III fluid cannot be used.
3 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
4 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
5 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
6 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
7 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
8 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
9 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
10 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 27.

TABLE 18: TYPE III HOLDOVER TIMES FOR ALLCLEAR AEROCLEAR MAX APPLIED UNHEATED ON MIDDLE SPEED AIRCRAFT[1]

Outside Air Temperature[2]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[3], or Ice Crystals[4]	Very Light Snow, Snow Grains or Snow Pellets[5,6,7]	Light Snow, Snow Grains or Snow Pellets[5,6,7]	Moderate Snow, Snow Grains or Snow Pellets[5,7]	Freezing Drizzle[8]	Light Freezing Rain	Rain on Cold-Soaked Wing[9]	Other[10]
-3 °C and above (27 °F and above)	100/0	0:45 - 1:55	1:20 - 1:45	0:40 - 1:20	0:18 - 0:40	0:25 - 0:50	0:14 - 0:25	0:05 - 0:40	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -10 °C (below 27 to 14 °F)	100/0	0:50 - 1:40	1:20 - 1:45	0:40 - 1:20	0:18 - 0:40	0:25 - 0:45	0:15 - 0:25		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -10 to -20.5 °C (below 14 to -5 °F)	100/0	0:40 - 1:45	1:20 - 1:45	0:40 - 1:20	0:18 - 0:40				

NOTES

1 These holdover times are for aircraft conforming to the SAE AS5900 middle speed aerodynamic test criterion. Fluid must be applied unheated to use these holdover times. No holdover times exist for this fluid applied heated. If uncertain whether the aircraft conforms to the low, middle, or high speed aerodynamic test criterion, no holdover time guidelines exist below -16°C (3°F).
2 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type III fluid cannot be used.
3 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
4 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
5 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
6 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
7 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
8 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
9 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
10 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 27.

TABLE 19: TYPE III HOLDOVER TIMES FOR ALLCLEAR AEROCLEAR MAX APPLIED UNHEATED ON HIGH SPEED AIRCRAFT[1]

Outside Air Temperature[2]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[3], or Ice Crystals[4]	Very Light Snow, Snow Grains or Snow Pellets[5,6,7]	Light Snow, Snow Grains or Snow Pellets[5,6,7]	Moderate Snow, Snow Grains or Snow Pellets[5,7]	Freezing Drizzle[8]	Light Freezing Rain	Rain on Cold-Soaked Wing[9]	Other[10]
-3 °C and above (27 °F and above)	100/0	0:45 - 1:55	1:20 - 1:45	0:40 - 1:20	0:18 - 0:40	0:25 - 0:50	0:14 - 0:25	0:05 - 0:40	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -10 °C (below 27 to 14 °F)	100/0	0:50 - 1:40	1:20 - 1:45	0:40 - 1:20	0:18 - 0:40	0:25 - 0:45	0:15 - 0:25		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -10 to -25 °C (below 14 to -13 °F)	100/0	0:40 - 1:45	1:20 - 1:45	0:40 - 1:20	0:18 - 0:40				
below -25 to -35 °C (below -13 to -31 °F)	100/0	0:25 - 1:00	0:45 - 1:00	0:20 - 0:45	0:10 - 0:20				

NOTES

1 These holdover times are for aircraft conforming to the SAE AS5900 high speed aerodynamic test criterion. Fluid must be applied unheated to use these holdover times. No holdover times exist for this fluid applied heated. If uncertain whether the aircraft conforms to the low, middle, or high speed aerodynamic test criterion, no holdover time guidelines exist below -16°C (3°F).
2 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type III fluid cannot be used.
3 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
4 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
5 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
6 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
7 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
8 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
9 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
10 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 47 provides allowance times for ice pellets and small hail for SAE Type III fluids, applied unheated).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 27.

HOT GUIDELINES FOR SAE TYPE IV FLUIDS
WINTER 2023-2024

The HOT Guidelines are provided for information and guidance purposes. The HOT Guidelines on their own do not change, create, amend or permit deviations from regulatory requirements.

The HOT Guidelines may use mandatory terms such as “must”, “shall” and “is/are required” so as to convey the intent of meeting regulatory requirements and SAE Standards, where applicable. The term “should” is to be understood, unless an alternative method of achieving safety is implemented that would meet or exceed the intent of the recommendation.

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The time of protection will be shortened in heavy weather conditions. Heavy precipitation rates or high moisture content, high wind velocity, or jet blast may reduce holdover time below the lowest time stated in the range. Holdover time may be reduced when aircraft skin temperature is lower than outside air temperature.
- Fluids used during ground de/anti-icing do not provide in-flight icing protection.
- This table is for departure planning only and should be used in conjunction with pretakeoff check procedures
- These holdover times are for aircraft conforming to the SAE AS5900 high speed aerodynamic test criterion. If uncertain whether the aircraft conforms to the low, middle, or high speed aerodynamic test criterion, no holdover time guidelines exist.

TABLE 20: GENERIC HOLDOVER TIMES FOR SAE TYPE IV FLUIDS[1]

Outside Air Temperature[2]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[3], or Ice Crystals[4]	Very Light Snow, Snow Grains or Snow Pellets[5,6,7]	Light Snow, Snow Grains or Snow Pellets[5,6,7]	Moderate Snow, Snow Grains or Snow Pellets[5,7]	Freezing Drizzle[8]	Light Freezing Rain	Rain on Cold-Soaked Wing[9]	Other[10]
-3 °C and above (27 °F and above)	100/0	1:15 - 2:40	1:55 - 2:20	1:00 - 1:55	0:30 - 1:00	0:40 - 1:10	0:20 - 0:35	0:08 - 1:05	
	75/25	1:25 - 2:40	2:05 - 2:25	1:15 - 2:05	0:40 - 1:15	1:00 - 1:20	0:30 - 0:50	0:09 - 1:20	
	50/50	0:30 - 0:55	1:00 - 1:10	0:25 - 1:00	0:10 - 0:25	0:15 - 0:40	0:09 - 0:20	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:20 - 1:35	1:45 - 2:05	0:55 - 1:45	0:25 - 0:55	0:25 - 1:10	0:20 - 0:25		
	75/25	0:30 - 1:20	1:50 - 2:10	1:05 - 1:50	0:30 - 1:05	0:20 - 1:05	0:15 - 0:25		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:20 - 1:35	1:30 - 1:50	0:50 - 1:30	0:25 - 0:50	0:25 - 1:10[11]	0:20 - 0:25[11]		
	75/25	0:30 - 1:20	1:40 - 2:00	0:55 - 1:40	0:25 - 0:55	0:20 - 1:05[11]	0:15 - 0:25[11]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:20 - 0:35	0:30 - 0:45	0:09 - 0:30	0:02 - 0:09				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:20 - 0:35	0:10 - 0:20	0:03 - 0:10	0:01 - 0:03				
below -25 °C to LOUT[12] (below -13 °F to LOUT)	100/0	0:20 - 0:35	0:07 - 0:10	0:02 - 0:07	0:00 - 0:02				

NOTES

1 To use the HOTs in this table, ensure that the fluid and dilution being used is listed in the Type IV Fluids Tested for Anti-Icing Performance and Aerodynamic Acceptance table (Table 54). Any restrictions on the use of the fluid have to be identified and applied.
2 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
3 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
4 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
5 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
6 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
7 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
8 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
9 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
10 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 48 provides allowance times for Type IV EG fluids and Table 49 provides allowance times for Type IV PG fluids in ice pellets and small hail. If the glycol type is unknown, the allowance times for SAE Type IV PG fluids should be used).
11 No holdover time guidelines exist for this condition below -10 °C (14 °F).
12 If the LOUT is unknown, no holdover time guidelines exist below -25.5 °C (-14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 21: TYPE IV HOLDOVER TIMES FOR ABAX ECOWING AD-49

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	3:20 - 4:00	3:00 - 3:00	1:55 - 3:00	1:00 - 1:55	1:25 - 2:00	1:00 - 1:25	0:10 - 1:55	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:20 - 1:35	2:55 - 3:00	1:30 - 2:55	0:45 - 1:30	0:25 - 1:25	0:20 - 0:25		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:20 - 1:35	2:25 - 3:00	1:15 - 2:25	0:40 - 1:15	0:25 - 1:25[10]	0:20 - 0:25[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:25 - 0:40	0:30 - 0:45	0:09 - 0:30	0:02 - 0:09				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:25 - 0:40	0:10 - 0:20	0:03 - 0:10	0:01 - 0:03				
below -25 to -26 °C (below -13 to -15 °F)	100/0	0:25 - 0:40	0:07 - 0:10	0:02 - 0:07	0:00 - 0:02				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 22: TYPE IV HOLDOVER TIMES FOR ALAB INTERNATIONAL PROFLIGHT EG4

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:10 - 4:00	2:30 - 3:00	1:20 - 2:30	0:40 - 1:20	1:05 - 1:55	0:35 - 0:55	0:15 - 2:00	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	2:05 - 3:55	3:00 - 3:00	1:40 - 3:00	0:55 - 1:40	1:00 - 2:00	0:50 - 1:05		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	2:05 - 3:55	3:00 - 3:00	1:55 - 3:00	1:00 - 1:55	1:00 - 2:00[10]	0:50 - 1:05[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:30 - 1:30	0:50 - 1:05	0:25 - 0:50	0:10 - 0:25				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:30 - 1:30	0:40 - 0:55	0:15 - 0:40	0:05 - 0:15				
below -25 to -26 °C (below -13 to -15 °F)	100/0	0:30 - 1:30	0:25 - 0:35	0:08 - 0:25	0:02 - 0:08				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 23: TYPE IV HOLDOVER TIMES FOR ALLCLEAR CLEARWING ECO

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:00 - 4:00	3:00 - 3:00	1:45 - 3:00	0:50 - 1:45	1:50 - 2:00	1:20 - 1:40	0:20 - 2:00	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:00 - 2:30	2:40 - 3:00	1:20 - 2:40	0:40 - 1:20	0:55 - 2:00	0:45 - 1:15		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:00 - 2:30	2:10 - 2:40	1:05 - 2:10	0:30 - 1:05	0:55 - 2:00[10]	0:45 - 1:15[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:25 - 0:45	1:05 - 1:20	0:35 - 1:05	0:15 - 0:35				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:25 - 0:45	0:30 - 0:35	0:15 - 0:30	0:07 - 0:15				
below -25 to -26 °C (below -13 to -15 °F)	100/0	0:25 - 0:45	0:25 - 0:35	0:15 - 0:25	0:07 - 0:15				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 24: TYPE IV HOLDOVER TIMES FOR ALLCLEAR CLEARWING EG

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:50 - 3:15	2:40 - 3:00	1:20 - 2:40	0:40 - 1:20	1:10 - 1:35	0:30 - 1:00	0:10 - 1:30	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:35 - 3:45	2:25 - 3:00	1:10 - 2:25	0:35 - 1:10	1:05 - 1:30	0:30 - 1:00		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:35 - 3:45	2:15 - 2:45	1:05 - 2:15	0:30 - 1:05	1:05 - 1:30[10]	0:30 - 1:00[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:55 - 2:00	1:35 - 2:05	0:45 - 1:35	0:20 - 0:45				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:55 - 2:00	0:55 - 1:10	0:25 - 0:55	0:15 - 0:25				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:55 - 2:00	0:45 - 0:55	0:20 - 0:45	0:10 - 0:20				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 25: TYPE IV HOLDOVER TIMES FOR ASGLOBAL 4FLITE EG

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:35 - 3:15	2:05 - 2:35	1:00 - 2:05	0:30 - 1:00	0:40 - 1:10	0:20 - 0:35	0:08 - 1:05	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:25 - 2:45	1:50 - 2:15	0:55 - 1:50	0:25 - 0:55	0:40 - 1:10	0:20 - 0:35		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:25 - 2:45	1:35 - 2:00	0:50 - 1:35	0:25 - 0:50	0:40 - 1:10[10]	0:20 - 0:35[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:50 - 1:25	1:35 - 2:00	0:45 - 1:35	0:20 - 0:45				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:50 - 1:25	1:20 - 1:40	0:35 - 1:20	0:20 - 0:35				
below -25 to -30 °C (below -13 to -22 °F)	100/0	0:30 - 1:05	0:55 - 1:05	0:25 - 0:55	0:10 - 0:25				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 26: TYPE IV HOLDOVER TIMES FOR ASGLOBAL 4FLITE PG

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:50 - 3:15	2:50 - 3:00	1:35 - 2:50	0:50 - 1:35	1:10 - 1:35	0:45 - 1:05	0:15 - 1:20	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:05 - 1:55	2:05 - 2:30	1:10 - 2:05	0:35 - 1:10	0:55 - 1:10	0:35 - 0:55		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:05 - 1:55	1:40 - 2:00	0:55 - 1:40	0:30 - 0:55	0:55 - 1:10[10]	0:35 - 0:55[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:30 - 0:45	1:05 - 1:20	0:35 - 1:05	0:15 - 0:35				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:30 - 0:45	0:35 - 0:45	0:20 - 0:35	0:09 - 0:20				
below -25 to -26 °C (below -13 to -15 °F)	100/0	0:30 - 0:45	0:35 - 0:45	0:20 - 0:35	0:08 - 0:20				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 27: TYPE IV HOLDOVER TIMES FOR AVIAFLUID AVIAFLIGHT EG

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:30 - 3:05	1:55 - 2:20	1:10 - 1:55	0:40 - 1:10	1:05 - 2:00	0:30 - 0:50	0:10 - 2:00	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:20 - 3:00	1:45 - 2:05	1:00 - 1:45	0:35 - 1:00	0:55 - 1:30	0:35 - 0:50		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:20 - 3:00	1:35 - 1:55	0:55 - 1:35	0:30 - 0:55	0:55 - 1:30[10]	0:35 - 0:50[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:35 - 1:45	1:40 - 2:00	0:50 - 1:40	0:25 - 0:50				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:35 - 1:45	1:20 - 1:35	0:40 - 1:20	0:20 - 0:40				
below -25 to -31 °C (below -13 to -24 °F)	100/0	0:35 - 1:05	0:35 - 0:45	0:20 - 0:35	0:09 - 0:20				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 28: TYPE IV HOLDOVER TIMES FOR AVIAFLUID AVIAFLIGHT PG

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:15 - 4:00	3:00 - 3:00	1:40 - 3:00	0:55 - 1:40	2:00 - 2:00	1:10 - 1:55	0:20 - 2:00	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:05 - 2:10	2:00 - 2:25	1:05 - 2:00	0:35 - 1:05	0:35 - 1:55	0:45 - 1:05		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:05 - 2:10	1:30 - 1:50	0:50 - 1:30	0:25 - 0:50	0:35 - 1:55[10]	0:45 - 1:05[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:20 - 0:35	0:50 - 1:00	0:25 - 0:50	0:15 - 0:25				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:20 - 0:35	0:25 - 0:30	0:15 - 0:25	0:06 - 0:15				
below -25 to -25.5 °C (below -13 to -14 °F)	100/0	0:20 - 0:35	0:25 - 0:30	0:10 - 0:25	0:06 - 0:10				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 29: TYPE IV HOLDOVER TIMES FOR CHEMCO CHEMR EG IV

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:05 - 3:35	3:00 - 3:00	1:15 - 3:00	0:35 - 1:15	0:45 - 1:40	0:25 - 0:40	0:09 - 1:45	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:25 - 3:40	3:00 - 3:00	1:15 - 3:00	0:35 - 1:15	1:00 - 1:35	0:35 - 0:50		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:25 - 3:40	3:00 - 3:00	1:15 - 3:00	0:35 - 1:15	1:00 - 1:35[10]	0:35 - 0:50[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:40 - 1:25	1:25 - 1:45	0:40 - 1:25	0:20 - 0:40				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:40 - 1:25	1:25 - 1:45	0:40 - 1:25	0:20 - 0:40				
below -25 to -27 °C (below -13 to -17 °F)	100/0	0:40 - 1:25	1:25 - 1:45	0:40 - 1:25	0:20 - 0:40				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 30: TYPE IV HOLDOVER TIMES FOR CHEMCO CHEMR NORDIK IV

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:15 - 4:00	3:00 - 3:00	1:45 - 3:00	0:55 - 1:45	1:20 - 2:00	0:55 - 1:20	0:25 - 2:00	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:50 - 4:00	3:00 - 3:00	1:45 - 3:00	0:55 - 1:45	1:15 - 2:00	0:45 - 1:20		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:50 - 4:00	3:00 - 3:00	1:45 - 3:00	0:55 - 1:45	1:15 - 2:00[10]	0:45 - 1:20[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:40 - 1:30	3:00 - 3:00	1:35 - 3:00	0:50 - 1:35				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:40 - 1:30	2:10 - 2:40	1:05 - 2:10	0:35 - 1:05				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:40 - 1:30	1:50 - 2:15	0:55 - 1:50	0:30 - 0:55				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 31: TYPE IV HOLDOVER TIMES FOR CLARIANT MAX FLIGHT AVIA

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	3:05 - 4:00	3:00 - 3:00	1:45 - 3:00	1:00 - 1:45	1:25 - 2:00	0:55 - 1:10	0:09 - 2:00	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:45 - 3:55	2:30 - 3:00	1:25 - 2:30	0:50 - 1:25	1:10 - 2:00	0:55 - 1:30		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:45 - 3:55	2:10 - 2:35	1:15 - 2:10	0:40 - 1:15	1:10 - 2:00[10]	0:55 - 1:30[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:35 - 1:25	0:50 - 1:05	0:25 - 0:50	0:10 - 0:25				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:35 - 1:25	0:40 - 0:55	0:15 - 0:40	0:05 - 0:15				
below -25 to -28.5 °C (below -13 to -19 °F)	100/0	0:35 - 1:25	0:25 - 0:35	0:08 - 0:25	0:02 - 0:08				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 32: TYPE IV HOLDOVER TIMES FOR CLARIANT MAX FLIGHT SNEG

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:25 - 4:00	3:00 - 3:00	1:40 - 3:00	0:55 - 1:40	2:00 - 2:00	0:50 - 1:40	0:20 - 1:30	
	75/25	4:00 - 4:00	2:25 - 2:50	1:30 - 2:25	0:55 - 1:30	1:30 - 2:00	1:05 - 1:20	0:15 - 1:45	
	50/50	1:30 - 3:30	1:45 - 2:20	0:45 - 1:45	0:20 - 0:45	0:35 - 1:10	0:15 - 0:30	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:45 - 2:20	2:25 - 2:55	1:20 - 2:25	0:45 - 1:20	0:30 - 1:25	0:25 - 0:40		
	75/25	0:30 - 1:25	1:55 - 2:15	1:10 - 1:55	0:45 - 1:10	0:20 - 1:05	0:20 - 0:40		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:45 - 2:20	2:05 - 2:30	1:10 - 2:05	0:40 - 1:10	0:30 - 1:25[10]	0:25 - 0:40[10]		
	75/25	0:30 - 1:25	1:40 - 2:00	1:00 - 1:40	0:40 - 1:00	0:20 - 1:05[10]	0:20 - 0:40[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:20 - 0:50	0:30 - 0:45	0:09 - 0:30	0:02 - 0:09				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:20 - 0:50	0:10 - 0:20	0:03 - 0:10	0:01 - 0:03				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:20 - 0:50	0:07 - 0:10	0:02 - 0:07	0:00 - 0:02				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 33: TYPE IV HOLDOVER TIMES FOR CLARIANT SAFEWING EG IV NORTH

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:20 - 3:55	3:00 - 3:00	1:40 - 3:00	0:50 - 1:40	1:30 - 2:00	0:50 - 0:55	0:08 - 2:00	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:45 - 4:00	2:50 - 3:00	1:30 - 2:50	0:50 - 1:30	1:05 - 1:50	0:55 - 1:25		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:45 - 4:00	2:45 - 3:00	1:30 - 2:45	0:50 - 1:30	1:05 - 1:50[10]	0:55 - 1:25[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:40 - 1:20	0:50 - 1:05	0:25 - 0:50	0:10 - 0:25				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:40 - 1:20	0:40 - 0:55	0:15 - 0:40	0:05 - 0:15				
below -25 to -30 °C (below -13 to -22 °F)	100/0	0:40 - 1:20	0:25 - 0:35	0:08 - 0:25	0:02 - 0:08				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 34: TYPE IV HOLDOVER TIMES FOR CLARIANT SAFEWING MP IV LAUNCH

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	4:00 - 4:00	2:50 - 3:00	1:45 - 2:50	1:05 - 1:45	1:30 - 2:00	1:00 - 1:40	0:15 - 1:40	
	75/25	3:40 - 4:00	3:00 - 3:00	1:45 - 3:00	1:00 - 1:45	1:40 - 2:00	0:45 - 1:15	0:10 - 1:45	
	50/50	1:25 - 2:45	1:25 - 1:40	0:45 - 1:25	0:25 - 0:45	0:30 - 0:50	0:20 - 0:25	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:00 - 1:55	2:25 - 2:50	1:30 - 2:25	0:55 - 1:30	0:35 - 1:40	0:25 - 0:45		
	75/25	0:40 - 1:20	2:40 - 3:00	1:30 - 2:40	0:50 - 1:30	0:25 - 1:10	0:25 - 0:45		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:00 - 1:55	2:10 - 2:30	1:20 - 2:10	0:50 - 1:20	0:35 - 1:40[10]	0:25 - 0:45[10]		
	75/25	0:40 - 1:20	2:25 - 2:55	1:25 - 2:25	0:45 - 1:25	0:25 - 1:10[10]	0:25 - 0:45[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:30 - 0:50	1:15 - 1:45	0:20 - 1:15	0:06 - 0:20				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:30 - 0:50	0:30 - 0:45	0:09 - 0:30	0:02 - 0:09				
below -25 to -28.5 °C (below -13 to -19 °F)	100/0	0:30 - 0:50	0:20 - 0:30	0:06 - 0:20	0:01 - 0:06				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 35: TYPE IV HOLDOVER TIMES FOR CLARIANT SAFEWING MP IV LAUNCH PLUS

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	3:55 - 4:00	3:00 - 3:00	2:05 - 3:00	0:55 - 2:05	2:00 - 2:00	1:00 - 2:00	0:20 - 2:00	
	75/25	3:55 - 4:00	3:00 - 3:00	1:55 - 3:00	0:50 - 1:55	2:00 - 2:00	1:20 - 1:25	0:20 - 1:50	
	50/50	1:15 - 1:50	1:35 - 2:00	0:45 - 1:35	0:20 - 0:45	0:25 - 1:00	0:15 - 0:20	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:55 - 2:15	3:00 - 3:00	1:40 - 3:00	0:45 - 1:40	0:25 - 1:35	0:25 - 0:40		
	75/25	0:40 - 2:00	3:00 - 3:00	1:30 - 3:00	0:35 - 1:30	0:20 - 1:05	0:20 - 0:30		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:55 - 2:15	3:00 - 3:00	1:25 - 3:00	0:40 - 1:25	0:25 - 1:35[10]	0:25 - 0:40[10]		
	75/25	0:40 - 2:00	2:55 - 3:00	1:15 - 2:55	0:30 - 1:15	0:20 - 1:05[10]	0:20 - 0:30[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:25 - 0:50	1:15 - 1:50	0:25 - 1:15	0:07 - 0:25				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:25 - 0:50	0:30 - 0:45	0:09 - 0:30	0:03 - 0:09				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:25 - 0:50	0:20 - 0:30	0:06 - 0:20	0:02 - 0:06				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 36: TYPE IV HOLDOVER TIMES FOR CRYOTECH POLAR GUARD® ADVANCE

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:50 - 4:00	3:00 - 3:00	1:55 - 3:00	1:05 - 1:55	1:35 - 2:00	1:15 - 1:30	0:15 - 2:00	
	75/25	2:30 - 4:00	3:00 - 3:00	1:25 - 3:00	0:40 - 1:25	1:40 - 2:00	0:40 - 1:10	0:09 - 1:40	
	50/50	0:50 - 1:25	1:10 - 1:35	0:25 - 1:10	0:10 - 0:25	0:20 - 0:45	0:09 - 0:20	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:55 - 2:30	2:25 - 2:50	1:25 - 2:25	0:50 - 1:25	0:35 - 1:35	0:35 - 0:45		
	75/25	0:40 - 1:30	2:20 - 3:00	1:05 - 2:20	0:30 - 1:05	0:25 - 1:05	0:35 - 0:45		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:55 - 2:30	2:00 - 2:20	1:10 - 2:00	0:40 - 1:10	0:35 - 1:35[10]	0:35 - 0:45[10]		
	75/25	0:40 - 1:30	2:00 - 2:30	0:55 - 2:00	0:25 - 0:55	0:25 - 1:05[10]	0:35 - 0:45[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:25 - 0:50	1:35 - 2:15	0:35 - 1:35	0:10 - 0:35				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:25 - 0:50	0:40 - 0:55	0:15 - 0:40	0:04 - 0:15				
below -25 to -30.5 °C (below -13 to -23 °F)	100/0	0:25 - 0:50	0:25 - 0:30	0:07 - 0:25	0:02 - 0:07				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 37: TYPE IV HOLDOVER TIMES FOR CRYOTECH POLAR GUARD® XTEND

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:30 - 4:00	3:00 - 3:00	2:00 - 3:00	1:05 - 2:00	2:00 - 2:00	1:00 - 1:50	0:20 - 1:45	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A		
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:00 - 1:50	2:50 - 3:00	1:35 - 2:50	0:50 - 1:35	0:35 - 1:40	0:50 - 0:55		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:00 - 1:50	2:25 - 2:55	1:20 - 2:25	0:45 - 1:20	0:35 - 1:40[10]	0:50 - 0:55[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:25 - 0:40	1:20 - 1:40	0:40 - 1:20	0:20 - 0:40				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:25 - 0:40	0:30 - 0:40	0:15 - 0:30	0:06 - 0:15				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:25 - 0:40	0:20 - 0:25	0:09 - 0:20	0:04 - 0:09				

CAUTION: No holdover time guidelines exist

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 38: TYPE IV HOLDOVER TIMES FOR DOW CHEMICAL UCAR ENDURANCE™ EG106

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:05 - 3:10	2:45 - 3:00	1:20 - 2:45	0:40 - 1:20	1:10 - 2:00	0:50 - 1:15	0:20 - 2:00	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:50 - 3:20	2:25 - 3:00	1:10 - 2:25	0:35 - 1:10	0:55 - 1:50	0:45 - 1:10		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:50 - 3:20	2:10 - 2:45	1:05 - 2:10	0:30 - 1:05	0:55 - 1:50[10]	0:45 - 1:10[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:30 - 1:05	1:45 - 2:15	0:50 - 1:45	0:25 - 0:50				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:30 - 1:05	1:30 - 1:55	0:40 - 1:30	0:20 - 0:40				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:30 - 1:05	1:20 - 1:45	0:40 - 1:20	0:20 - 0:40				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 39: TYPE IV HOLDOVER TIMES FOR DOW CHEMICAL UCAR™ FLIGHTGUARD™ AD-49

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	3:20 - 4:00	3:00 - 3:00	1:55 - 3:00	1:00 - 1:55	1:25 - 2:00	1:00 - 1:25	0:10 - 1:55	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:20 - 1:35	2:55 - 3:00	1:30 - 2:55	0:45 - 1:30	0:25 - 1:25	0:20 - 0:25		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:20 - 1:35	2:25 - 3:00	1:15 - 2:25	0:40 - 1:15	0:25 - 1:25[10]	0:20 - 0:25[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:25 - 0:40	0:30 - 0:45	0:09 - 0:30	0:02 - 0:09				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:25 - 0:40	0:10 - 0:20	0:03 - 0:10	0:01 - 0:03				
below -25 to -26 °C (below -13 to -15 °F)	100/0	0:25 - 0:40	0:07 - 0:10	0:02 - 0:07	0:00 - 0:02				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 40: TYPE IV HOLDOVER TIMES FOR INLAND TECHNOLOGIES ECO-SHIELD®

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:15 - 2:40	2:25 - 2:50	1:20 - 2:25	0:45 - 1:20	0:40 - 1:30	0:35 - 0:40	0:15 - 1:35	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A		
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:10 - 2:35	2:05 - 2:30	1:10 - 2:05	0:40 - 1:10	0:50 - 1:25	0:30 - 0:40		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:10 - 2:35	1:55 - 2:15	1:05 - 1:55	0:35 - 1:05	0:50 - 1:25[10]	0:30 - 0:40[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:30 - 1:00	0:30 - 0:45	0:09 - 0:30	0:02 - 0:09				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:30 - 1:00	0:10 - 0:20	0:03 - 0:10	0:01 - 0:03				
below -25 to -25.5 °C (below -13 to -14 °F)	100/0	0:30 - 1:00	0:07 - 0:10	0:02 - 0:07	0:00 - 0:02				

CAUTION: No holdover time guidelines exist

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 41: TYPE IV HOLDOVER TIMES FOR JSC RCP NORDIX DEFROST ECO 4

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:30 - 2:40	2:30 - 3:00	1:15 - 2:30	0:35 - 1:15	1:05 - 1:30	0:40 - 1:05	0:15 - 1:10	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:55 - 2:35	2:15 - 2:45	1:05 - 2:15	0:35 - 1:05	0:50 - 1:20	0:35 - 0:50		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:55 - 2:35	2:05 - 2:35	1:00 - 2:05	0:30 - 1:00	0:50 - 1:20[10]	0:35 - 0:50[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:30 - 0:50	0:30 - 0:45	0:09 - 0:30	0:02 - 0:09				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:30 - 0:50	0:10 - 0:20	0:03 - 0:10	0:01 - 0:03				
below -25 to -25.5 °C (below -13 to -14 °F)	100/0	0:30 - 0:50	0:07 - 0:10	0:02 - 0:07	0:00 - 0:02				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 42: TYPE IV HOLDOVER TIMES FOR JSC RCP NORDIX DEFROST NORTH 4

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:10 - 4:00	2:55 - 3:00	1:25 - 2:55	0:40 - 1:25	1:05 - 2:00	0:30 - 0:50	0:09 - 1:55	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	2:40 - 4:00	2:55 - 3:00	1:25 - 2:55	0:40 - 1:25	1:05 - 2:00	0:40 - 1:00		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	2:40 - 4:00	2:55 - 3:00	1:25 - 2:55	0:40 - 1:25	1:05 - 2:00[10]	0:40 - 1:00[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:45 - 1:55	0:50 - 1:05	0:25 - 0:50	0:10 - 0:25				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:45 - 1:55	0:40 - 0:55	0:15 - 0:40	0:05 - 0:15				
below -25 to -26 °C (below -13 to -15 °F)	100/0	0:45 - 1:55	0:25 - 0:35	0:08 - 0:25	0:02 - 0:08				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 43: TYPE IV HOLDOVER TIMES FOR KILFROST ABC-S PLUS

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:10 - 4:00	3:00 - 3:00	2:05 - 3:00	1:15 - 2:05	1:50 - 2:00	1:05 - 2:00	0:25 - 2:00	
	75/25	1:25 - 2:40	2:05 - 2:25	1:15 - 2:05	0:45 - 1:15	1:00 - 1:20	0:30 - 0:50	0:10 - 1:20	
	50/50	0:30 - 0:55	1:00 - 1:10	0:30 - 1:00	0:15 - 0:30	0:15 - 0:40	0:15 - 0:20	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:55 - 3:30	3:00 - 3:00	1:50 - 3:00	1:05 - 1:50	0:25 - 1:35	0:20 - 0:30		
	75/25	0:45 - 1:50	1:50 - 2:10	1:05 - 1:50	0:40 - 1:05	0:20 - 1:10	0:15 - 0:25		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:55 - 3:30	2:55 - 3:00	1:45 - 2:55	1:00 - 1:45	0:25 - 1:35[10]	0:20 - 0:30[10]		
	75/25	0:45 - 1:50	1:45 - 2:00	1:00 - 1:45	0:35 - 1:00	0:20 - 1:10[10]	0:15 - 0:25[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:40 - 1:00	0:30 - 0:45	0:09 - 0:30	0:02 - 0:09				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:40 - 1:00	0:10 - 0:20	0:03 - 0:10	0:01 - 0:03				
below -25 to -28 °C (below -13 to -18 °F)	100/0	0:40 - 1:00	0:07 - 0:10	0:02 - 0:07	0:00 - 0:02				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 44: TYPE IV HOLDOVER TIMES FOR NEWAVE AEROCHEMICAL FCY 9311

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:55 - 4:00	2:20 - 2:55	1:10 - 2:20	0:35 - 1:10	1:10 - 2:00	0:40 - 1:05	0:15 - 1:25	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:35 - 2:05	1:50 - 2:20	0:55 - 1:50	0:30 - 0:55	0:35 - 1:20	0:20 - 0:35		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:35 - 2:05	1:35 - 2:00	0:50 - 1:35	0:25 - 0:50	0:35 - 1:20[10]	0:20 - 0:35[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:30 - 0:55	1:00 - 1:15	0:30 - 1:00	0:15 - 0:30				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:30 - 0:55	0:35 - 0:40	0:15 - 0:35	0:07 - 0:15				
below -25 to -29.5 °C (below -13 to -21 °F)	100/0	0:30 - 0:55	0:30 - 0:40	0:15 - 0:30	0:06 - 0:15				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

TABLE 45: TYPE IV HOLDOVER TIMES FOR NEWAVE AEROCHEMICAL FCY-EGIV

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:35 - 4:00	2:35 - 3:00	1:10 - 2:35	0:35 - 1:10	1:20 - 2:00	0:40 - 1:05	0:15 - 2:00	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:25 - 3:25	2:10 - 2:45	1:00 - 2:10	0:25 - 1:00	0:50 - 2:00	0:45 - 1:05		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:25 - 3:25	1:55 - 2:25	0:50 - 1:55	0:25 - 0:50	0:50 - 2:00[10]	0:45 - 1:05[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:35 - 1:55	1:35 - 2:05	0:40 - 1:35	0:15 - 0:40				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:35 - 1:55	1:10 - 1:35	0:30 - 1:10	0:15 - 0:30				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:35 - 1:55	1:00 - 1:20	0:25 - 1:00	0:10 - 0:25				

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 31.

HOT GUIDELINES FOR MIXED SNOW AND FREEZING FOG
WINTER 2023-2024

The HOT Guidelines are provided for information and guidance purposes. The HOT Guidelines on their own do not change, create, amend or permit deviations from regulatory requirements.

The HOT Guidelines may use mandatory terms such as “must”, “shall” and “is/are required” so as to convey the intent of meeting regulatory requirements and SAE Standards, where applicable. The term “should” is to be understood, unless an alternative method of achieving safety is implemented that would meet or exceed the intent of the recommendation.

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The time of protection will be shortened in heavy weather conditions. Heavy precipitation rates or high moisture content, high wind velocity, or jet blast may reduce holdover time below the lowest time stated in the range. Holdover time may be reduced when aircraft skin temperature is lower than outside air temperature.
- Fluids used during ground de/anti-icing do not provide in-flight icing protection.
- This table is for departure planning only and should be used in conjunction with pretakeoff check procedures

TABLE 46: HOLDOVER TIMES FOR SNOW MIXED WITH FREEZING FOG FOR SAE TYPE I, TYPE II, TYPE III, AND TYPE IV FLUIDS[1,2]

Outside Air Temperature	Type I[3] Aluminum	Type I[3] Composite	Type III[4]
below 0 °C to -3 °C (below 32 °F to 27 °F)	0:03 - 0:06	0:02 - 0:03	0:09 - 0:20
below -3 to -6 °C (below 27 to 21 °F)	0:03 - 0:04	0:01 - 0:03	0:09 - 0:20
below -6 to -10 °C (below 21 to 14 °F)	0:02 - 0:03	0:01 - 0:03	0:09 - 0:20
below -10 to -25 °C[6] (below 14 to -13 °F[6])	0:01 - 0:02	0:01 - 0:02	0:09 - 0:20[5]
below -25 °C to LOUT[6] (below -13 °F to LOUT[6])	0:01 - 0:02	0:01 - 0:02	0:05 - 0:10[5]

Outside Air Temperature	Concentration Fluid/Water By % Volume	Type II	Type IV
below 0 °C to -3 °C (below 32 °F to 27 °F)	100/0	0:15 - 0:28	0:15 - 0:30
	75/25	0:08 - 0:15	0:20 - 0:38
	50/50	0:04 - 0:08	0:05 - 0:13
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:10 - 0:20	0:13 - 0:28
	75/25	0:05 - 0:13	0:15 - 0:33
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:08 - 0:15	0:13 - 0:25
	75/25	0:05 - 0:10	0:13 - 0:28
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:01 - 0:04	0:01 - 0:05
below -18 to -25 °C[6] (below 0 to -13 °F[6])	100/0	0:01 - 0:02	0:01 - 0:02
below -25 °C to LOUT[6] (below -13 °F to LOUT[6])	100/0	0:00 - 0:01	0:00 - 0:01

NOTES

1 To use the HOTs in this table, ensure that the fluid and dilution being used is listed in the List of Qualified Fluids Tested for Anti-Icing Performance and Aerodynamic Acceptance table (Table 51-Table 54). Any restrictions on the use of the fluid have to be identified and applied.
2 These holdover times are for use in -SN FZFG and SN FZFG. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “moderate”. No holdover times exist if the reported visibility correlates to a “heavy” precipitation intensity.
3 Type I Fluid / Water Mixture must be selected so that the freezing point of the mixture is at least 10 °C (18 °F) below outside air temperature.
4 To use the Type III fluid holdover times, the fluid brand being used must be known. AllClear AeroClear MAX must be applied unheated.
5 No holdover time guidelines exist below -16°C (3°F) for low speed aircraft and below -20.5 °C (-5 °F) middle speed aircraft. If uncertain whether the aircraft conforms to the low, middle, or high speed aerodynamic test criterion, no holdover time guidelines exist below -16°C (3°F).
6 Ensure that the lowest operational use temperature (LOUT) is respected. If the LOUT is unknown, no holdover time guidelines exist below -25 °C (-13 °F) for Type II fluids and below -25.5 °C (-14 °F) for Type IV fluids.

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 58.

ALLOWANCE TIMES TABLES FOR WINTER 2023-2024

The HOT Guidelines are provided for information and guidance purposes. The HOT Guidelines on their own do not change, create, amend or permit deviations from regulatory requirements.

The HOT Guidelines may use mandatory terms such as “must”, “shall” and “is/are required” so as to convey the intent of meeting regulatory requirements and SAE Standards, where applicable. The term “should” is to be understood, unless an alternative method of achieving safety is implemented that would meet or exceed the intent of the recommendation.

CAUTIONS

- The responsibility for the application of these data remains with the user.
- Fluids used during ground de/anti-icing do not provide in-flight icing protection.
- This table is for departure planning only and should be used in conjunction with pretakeoff check procedures.
- Allowance time cannot be extended by an inspection of the aircraft critical surfaces.

TABLE 47: ALLOWANCE TIMES FOR SAE TYPE III FLUIDS[1,2]

Precipitation Types or Combinations	Applicable METAR Codes	Outside Air Temperature		
		-5 °C and above (23 °F and above)	Below -5 to -10 °C (Below 23 to 14 °F)	Below -10 °C[3] (Below 14 °F)
Light Ice Pellets	**-PL**	10 minutes	10 minutes	**Caution: No allowance times currently exist**
Light Ice Pellets Mixed with Light Snow	**-PL SN, -SN PL**	10 minutes	10 minutes	
Light Ice Pellets Mixed with Light Freezing Drizzle or Moderate Freezing Drizzle	**-PL FZDZ, -FZDZ PL, FZDZ PL**	7 minutes	5 minutes	
Light Ice Pellets Mixed with Light Drizzle or Moderate Drizzle	**-PL DZ, -DZ PL, DZ PL**	7 minutes[4]		
Light Ice Pellets Mixed with Light Freezing Rain	**-PL FZRA, -FZRA PL**	7 minutes	5 minutes	
Light Ice Pellets Mixed with Light Rain	**-PL RA, -RA PL**	7 minutes[5]		
Moderate Ice Pellets (or Small Hail[6])	**PL, GS**	5 minutes	5 minutes	

NOTES

1 These allowance times are for use with undiluted (100/0) fluids applied unheated on aircraft with rotation speeds of 100 knots or greater.
2 Takeoff is allowed up to 90 minutes after start of fluid application if the precipitation stops at or before the allowance time expires and does not restart. The OAT must not decrease during the 90 minutes to use this guidance in conditions of light ice pellets mixed with either: light freezing drizzle, moderate freezing drizzle, light freezing rain, or light rain.
3 Ensure that the lowest operational use temperature (LOUT) is respected.
4 No allowance times exist in this condition for temperatures of 0 °C and below; consider use of light ice pellets mixed with light freezing drizzle or moderate freezing drizzle.
5 No allowance times exist in this condition for temperatures of 0 °C and below; consider use of light ice pellets mixed with light freezing rain.
6 In the US, small hail is reported by METAR as GR and the remarks section is used to indicate “GR LESS THAN ¼”. Outside of the US the METAR code GS is used to indicate small hail when it is less than 5 mm and GR to indicate hail when it is 5mm or greater. If METAR does not report an intensity for small hail, use the “moderate ice pellets or small hail” allowance times. If METAR reports an intensity with small hail, the ice pellet condition with the equivalent intensity can be used, e.g. if light small hail is reported, the “light ice pellets” allowance times can be used. This also applies in mixed conditions, e.g. if light small hail mixed with light snow is reported, use the “light ice pellets mixed with light snow” allowance times.

CAUTIONS

- The cautions that apply to the allowance times in the table above can be found on page 60.

TABLE 48: ALLOWANCE TIMES FOR SAE TYPE IV ETHYLENE GLYCOL (EG) FLUIDS[1,2]

Precipitation Types or Combinations	Applicable METAR Codes	Outside Air Temperature			
		-5 °C and above[3] (23 °F and above)	Below -5 to -10 °C[3] (Below 23 to 14 °F)	Below -10 to -16 °C[3] (Below 14 to 3 °F)	Below -16 to -22 °C[3,4] (Below 3 to -8 °F)
Light Ice Pellets	**-PL**	70 minutes	50 minutes	50 minutes	30 minutes
Light Ice Pellets Mixed with Light Snow	**-PL SN, -SN PL**	50 minutes	30 minutes	25 minutes	
Light Ice Pellets Mixed with Light Freezing Drizzle or Moderate Freezing Drizzle	**-PL FZDZ, -FZDZ PL, FZDZ PL**	40 minutes	30 minutes	**Caution: No allowance times currently exist**	
Light Ice Pellets Mixed with Light Drizzle or Moderate Drizzle	**-PL DZ, -DZ PL, DZ PL**	40 minutes[5]			
Light Ice Pellets Mixed with Light Freezing Rain	**-PL FZRA, -FZRA PL**	40 minutes	30 minutes		
Light Ice Pellets Mixed with Light Rain	**-PL RA, -RA PL**	40 minutes[6]			
Moderate Ice Pellets (or Small Hail[7])	**PL, GS**	35 minutes	25 minutes	15 minutes	10 minutes
Moderate Ice Pellets (or Small Hail[7]) Mixed with Moderate Freezing Drizzle	**PL FZDZ, GS FZDZ,**	20 minutes	10 minutes	**Caution: No allowance times currently exist**	
Moderate Ice Pellets (or Small Hail[7]) Mixed with Moderate Drizzle	**PL DZ, GS DZ**	20 minutes[8]			
Moderate Ice Pellets (or Small Hail[7]) Mixed with Moderate Rain	**PL RA, GS RA, RA PL, RA GS**	15 minutes[9]			

NOTES

1 These allowance times are for use with undiluted (100/0) EG based fluids. The following fluids are EG based; ALAB International PROFLIGHT EG4, AllClear ClearWing EG, ASGlobal 4Flite EG, AVIAFLUID AVIAFlight EG, CHEMCO ChemR EG IV, CHEMCO ChemR Nordik IV, Clariant Max Flight AVIA, Clariant Safewing EG IV NORTH, Dow EG106, JSC RCP Nordix Defrost NORTH 4, and Newave Aerochemical FCY-EGIV. If the glycol type is unknown, the allowance times for SAE Type IV PG fluids should be used.

2 Takeoff is allowed up to 90 minutes after start of fluid application if the precipitation stops at or before the allowance time expires and does not restart. The OAT must not decrease during the 90 minutes to use this guidance in conditions of light ice pellets mixed with either: light freezing drizzle, moderate freezing drizzle, light freezing rain, or light rain.

3 No allowance times exist for EG based fluids when used on aircraft with rotation speeds less than 100 knots.

4 Ensure that the lowest operational use temperature (LOUT) is respected.

5 No allowance times exist in this condition for temperatures of 0 °C and below; consider use of light ice pellets mixed with light freezing drizzle or moderate freezing drizzle.

6 No allowance times exist in this condition for temperatures of 0 °C and below; consider use of light ice pellets mixed with light freezing rain.

7 In the US, small hail is reported by METAR as GR and the remarks section is used to indicate “GR LESS THAN ¼”. Outside of the US the METAR code GS is used to indicate small hail when it is less than 5 mm and GR to indicate hail when it is 5mm or greater. If METAR does not report an intensity for small hail, use the “moderate ice pellets or small hail” allowance times. If METAR reports an intensity with small hail, the ice pellet condition with the equivalent intensity can be used, e.g. if light small hail is reported, the “light ice pellets” allowance times can be used. This also applies in mixed conditions, e.g. if light small hail mixed with light snow is reported, use the “light ice pellets mixed with light snow” allowance times.

8 No allowance times exist in this condition for temperatures of 0 °C and below; consider use of moderate ice pellets (or small hail) mixed with moderate freezing drizzle.

9 No allowance times exist in this condition for temperatures of 0 °C and below.

CAUTIONS

- The cautions that apply to the allowance times in the table above can be found on page 60.

TABLE 49: ALLOWANCE TIMES FOR SAE TYPE IV PROPYLENE GLYCOL (PG) FLUIDS[1,2]

Precipitation Types or Combinations	Applicable METAR Codes	Outside Air Temperature			
		-5 °C and above[3] (23 °F and above)	Below -5 to -10 °C[3] (Below 23 to 14 °F)	Below -10 to -16 °C[4] (Below 14 to 3 °F)	Below -16 to -22 °C[4,5] (Below 3 to -8 °F)
Light Ice Pellets	**-PL**	50 minutes	30 minutes	30 minutes	20 minutes
Light Ice Pellets Mixed with Light Snow	**-PL SN, -SN PL**	40 minutes	15 minutes	15 minutes	
Light Ice Pellets Mixed with Light Freezing Drizzle or Moderate Freezing Drizzle	**-PL FZDZ, -FZDZ PL, FZDZ PL**	25 minutes	10 minutes		
Light Ice Pellets Mixed with Light Drizzle or Moderate Drizzle	**-PL DZ, -DZ PL, DZ PL**	25 minutes[6]		**Caution: No allowance times currently exist**	
Light Ice Pellets Mixed with Light Freezing Rain	**-PL FZRA, -FZRA PL**	25 minutes	10 minutes		
Light Ice Pellets Mixed with Light Rain	**-PL RA, -RA PL**	25 minutes[7]			
Moderate Ice Pellets (or Small Hail[8])	**PL, GS**	15 minutes	10 minutes	10 minutes	
Moderate Ice Pellets (or Small Hail[8]) Mixed with Moderate Freezing Drizzle	**PL FZDZ, GS FZDZ**	10 minutes	7 minutes		
Moderate Ice Pellets (or Small Hail[8]) Mixed with Moderate Drizzle	**PL DZ, GS DZ**	10 minutes[9]		**Caution: No allowance times currently exist**	
Moderate Ice Pellets (or Small Hail[8]) Mixed with Moderate Rain	**PL RA, GS RA, RA PL, RA GS**	10 minutes[10]			

NOTES

1 These allowance times are for use with undiluted (100/0) PG based fluids applied on aircraft with rotation speeds of 100 knots or greater. All Type IV fluids are PG based with the exception of ALAB International PROFLIGHT EG4, AllClear ClearWing EG, ASGlobal 4Flite EG, AVIAFLUID AVIAFlight EG, CHEMCO ChemR EG IV, CHEMCO ChemR Nordik IV, Clariant Max Flight AVIA, Clariant Safewing EG IV NORTH, Dow EG106, JSC RCP Nordix Defrost NORTH 4, and Newave Aerochemical FCY-EGIV, which are EG based. If the glycol type is unknown, the allowance times for SAE Type IV PG fluids should be used.

2 Takeoff is allowed up to 90 minutes after start of fluid application if the precipitation stops at or before the allowance time expires and does not restart. The OAT must not decrease during the 90 minutes to use this guidance in conditions of light ice pellets mixed with either: light freezing drizzle, moderate freezing drizzle, light freezing rain, or light rain.

3 No allowance times exist for PG based fluids when used on aircraft with rotation speeds less than 100 knots.

4 No allowance times exist for PG based fluids when used on aircraft with rotation speeds less than 115 knots.

5 Ensure that the lowest operational use temperature (LOUT) is respected.

6 No allowance times exist in this condition for temperatures of 0 °C and below; consider use of light ice pellets mixed with light freezing drizzle or moderate freezing drizzle.

7 No allowance times exist in this condition for temperatures of 0 °C and below; consider use of light ice pellets mixed with light freezing rain.

8 In the US, small hail is reported by METAR as GR and the remarks section is used to indicate “GR LESS THAN ¼”. Outside of the US the METAR code GS is used to indicate small hail when it is less than 5 mm and GR to indicate hail when it is 5mm or greater. If METAR does not report an intensity for small hail, use the “moderate ice pellets or small hail” allowance times. If METAR reports an intensity with small hail, the ice pellet condition with the equivalent intensity can be used, e.g. if light small hail is reported, the “light ice pellets” allowance times can be used. This also applies in mixed conditions, e.g. if light small hail mixed with light snow is reported, use the “light ice pellets mixed with light snow” allowance times.

9 No allowance times exist in this condition for temperatures of 0 °C and below; consider use of moderate ice pellets (or small hail) mixed with moderate freezing drizzle.

10 No allowance times exist in this condition for temperatures of 0 °C and below.

CAUTIONS

- The cautions that apply to the allowance times in the table above can be found on page 60.

SUPPLEMENTAL GUIDANCE FOR WINTER 2023-2024

The HOT Guidelines are provided for information and guidance purposes. The HOT Guidelines on their own do not change, create, amend or permit deviations from regulatory requirements.

The HOT Guidelines may use mandatory terms such as “must”, “shall” and “is/are required” so as to convey the intent of meeting regulatory requirements and SAE Standards, where applicable. The term “should” is to be understood, unless an alternative method of achieving safety is implemented that would meet or exceed the intent of the recommendation.

TABLE 50: SNOWFALL INTENSITIES AS A FUNCTION OF PREVAILING VISIBILITY

Visibility		Day		Night	
Statute Miles	Meters	-1°C and below 30 °F and below	Above -1°C Above 30 °F	-1°C and Below 30 °F and below	Above -1°C Above 30 °F
≤1/4 (≤3/8)	**≤400** (≤600)	Heavy	Heavy	Heavy	Heavy
1/2 (>3/8 to ≤5/8)	**800** (>600 to ≤1000)	Moderate	Heavy	Heavy	Heavy
3/4 (>5/8 to ≤7/8)	**1200** (>1000 to ≤1400)	Moderate	Moderate	Moderate	Heavy
1 (>7/8 to ≤1 1/8)	**1600** (>1400 to ≤1800)	Light	Light	Moderate	Moderate
1 ¼ (>1 1/8 to ≤1 3/8)	**2000** (>1800 to ≤2200)	Light	Light	Moderate	Moderate
1 ½ (>1 3/8 to ≤1 5/8)	**2400** (>2200 to ≤2600)	Light	Light	Moderate	Moderate
1 ¾ (>1 5/8 to ≤1 7/8)	**2800** (>2600 to ≤3000)	Very Light	Light	Light	Light
2 (>1 7/8 to ≤2 ¼)	**3200** (>3000 to ≤3600)	Very Light	Very Light	Light	Light
2 ½ (>2 ¼ to ≤2 ¾)	**4000** (>3600 to ≤4400)	Very Light	Very Light	Very Light	Very Light
3 (>2 ¾ to ≤3 ¼)	**4800** (>4400 to ≤5200)	Very Light	Very Light	Very Light	Very Light
≥3 ½ (>3 ¼)	**≥5600** (>5200)	Very Light	Very Light	Very Light	Very Light

NOTES

- The METAR/SPECI reported visibility or flight crew observed visibility will be used with this visibility table to establish snowfall intensity for Type I, II, III and IV holdover time guidelines, during snow, snow grain, or snow pellet precipitation conditions. This visibility table will also be used when snow, snow grains, or snow pellets are accompanied by blowing or drifting snow, or when snow is mixed with ice crystals or freezing fog in the METAR/SPECI.
- The use of Runway Visual Range (RVR) is not permitted for determining visibility used with the holdover tables.
- Some METARs contain tower visibility as well as surface visibility. Whenever surface visibility is available from an official source, such as a METAR, in either the main body of the METAR or in the Remarks ("RMK") section, the preferred action is to use the surface visibility value.
- If the visibility is being reduced by snow along with form(s) of obscuration such as fog, haze, smoke, etc., use of the table above may overestimate the actual snowfall intensity. However, use of the snowfall intensity being reported by the weather observer or automated surface observing system (ASOS), from the FMH-1 Table, may underestimate the actual snowfall intensity as it does not directly correlate to the snowfall intensities used when determining holdover times. Use of the visibility table in all snow conditions with or without obscurations is recommended.

Example for how to read and use the table: `CYVO 160200Z 15011G17KT 1SM -SN DRSN OVC009 M06/M08 A2948`

In the above METAR the snowfall intensity is reported as light. However, based upon the "Snowfall Intensities as a Function of Prevailing Visibility" table, with a visibility of 1 statute mile, at night and a temperature of -6°C, the snowfall intensity is classified as moderate. The snowfall intensity of moderate - not the METAR reported intensity of light - will be used to determine which holdover time guideline value is appropriate for the fluid in use.

TABLE 51:
TYPE I FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE

(see cautions and notes on pages 76 and 77)

Fluid Name	Type of Glycol[1]	Expiry[2] (y-m-d)	Lowest Operational Use Temperature[3]						
			Dilution[4,5] (fluid/water)	low speed aerodynamic test[6]		middle speed aerodynamic test[6]		high speed aerodynamic test[6]	
				°C	°F	°C	°F	°C	°F
ABAX Industries									
DE-950	PG	26-06-01	71/29	-26	-15	Not tested[11]		-31	-24
ADDCON EUROPE GmbH[10]									
IceFree I.80	*PG*	*21-03-14[9]*	*70/30*	*-26*	*-15*	*Not tested[11]*		*-32*	*-26*
Aero Mag 2000 SYR LLC									
DeiceX PG ADF Concentrate[12]	PG	27-06-15	65/35	Currently in testing[13]		Not tested[11]		-31.5	-25
ALAB Industries[10]									
WDF 1	*EG*	*22-03-02[9]*	*70/30*	*-40*	*-40*	*Not tested[11]*		*-45*	*-49*
ALAB International									
PROFLIGHT EG1	EG	25-06-01	70/30	-43.5	-46	Not tested[11]		-44	-47
AllClear Systems LLC[10]									
Lift-Off E-188	EG	26-06-01	70/30	-40	-40	Not tested[11]		-41.5	-43
Lift-Off P-88	PG	26-06-01	70/30	-24.5	-12	Not tested[11]		-29.5	-21
Arcton Ltd.[10]									
Arctica DG ready-to-use	*DEG*	*22-03-26[9]*	*as supplied*	*-26*	*-15*	*Not tested[11]*		*-26*	*-15*
ASGlobal									
Sky-Go EG	EG	26-09-23	70/30	-31[14]	-24[14]	Not tested[11]		-40	-40
Sky-Go PG	PG	26-07-27	70/30	-21.5[14]	-7[14]	Not tested[11]		-30.5	-23
Sky-Go PG 80	PG	23-09-02	70/30	-25	-13	Not tested[11]		-31.5	-25
AVIAFLUID International Ltd									
AVIAFLO EG	*EG*	*21-06-19[9]*	*70/30*	*-40.5*	*-41*	*Not tested[11]*		*-44*	*-47*
AVIAFLO PG	*PG*	*22-02-10[9]*	*70/30*	*Not tested[11]*		*Not tested[11]*		*-30*	*-22*
Aviation Xi'an High-Tech Physical Chemical Co. Ltd.									
Cleanwing I	*PG*	*23-05-14[13]*	*75/25*	*Not tested[11]*		*Not tested[11]*		*-39.5*	*-39*
Cleanwing E	*EG*	*22-07-09[9]*	*75/25*	*-37*	*-35*	*Not tested[11]*		*-37*	*-35*
Cleanwing S-92	*EG*	*22-06-03[9]*	*75/25*	*-35*	*-31*	*Not tested[11]*		*-40*	*-40*
KHF-1	*PG*	*23-05-24[13]*	*75/25*	*Not tested[11]*		*Not tested[11]*		*-38.5*	*-37*

TABLE 51 (CONT'D):
TYPE I FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE

(see cautions and notes on pages 76 and 77)

Fluid Name	Type of Glycol[1]	Expiry[2] (y-m-d)	Lowest Operational Use Temperature[3]						
			Dilution[4,5] (fluid/water)	low speed aerodynamic test[6]		middle speed aerodynamic test[6]		high speed aerodynamic test[6]	
				°C	°F	°C	°F	°C	°F
Beijing Wangye Aviation Chemical Product Co Ltd.[10]									
KLA-1	*EG*	*19-09-08[9]*	*60/40*	*Not tested[11]*		*Not tested[11]*		*-30.5*	*-23*
KLA-1A	*EG*	*22-05-22[9]*	*60/40*	*Not tested[11]*		*Not tested[11]*		*-32*	*-26*
Beijing Yadilite Aviation Advanced Materials Corporation									
YD-101 Type I	*PG*	*21-03-07[9]*	*60/40*	*Not tested[11]*		*Not tested[11]*		*-30*	*-22*
YD-101A Type I	EG	25-02-26	70/30	Not tested[11]		Not tested[11]		-38	-36
CHEMCO Inc.									
CHEMR EG I	EG	24-04-17	70/30	-37	-35	Not tested[11]		-43	-45
CHEMR REG I	EG	26-06-01	75/25	-36.5	-34	Not tested[11]		-43.5	-46
Clariant Produkte (Deutschland) GmbH									
Octaflo EF Concentrate	*PG*	*22-03-28[9]*	*65/35*	*-25*	*-13*	*Not tested[11]*		*-33*	*-27*
Octaflo LYOD	EG	24-07-28	70/30	-40	-40	Not tested[11]		-45.5	-50
Safewing EG I 1996 (88)	EG	23-11-19	70/30	-39.5	-39	Not tested[11]		-41.5	-43
Safewing MP I 1938 ECO	PG	24-07-02	65/35	-25.5	-14	*Not tested[11]*		-32	-26
Safewing MP I 1938 ECO (80)	PG	24-06-23	71/29	-25	-13	Not tested[11]		-32.5	-27
Safewing MP I 1938 ECO (80) Premix 55% i.g. ready-to-use	PG	25-04-01	as supplied	Not tested[11]		Not tested[11]		-19	-2
Safewing MP I ECO PLUS (80)	*PG*	*23-04-12[13]*	*71/29*	*-25*	*-13*	*Not tested[11]*		*-33*	*-27*
Safewing MP I LFD 80	PG	25-04-15	71/29	-26	-15	Not tested[11]		-33	-27
Safewing MP I LFD 80 Pre-Mix 55%	PG	23-08-26	as supplied	Not tested[11]		Not tested[11]		-17	1
Safewing MP I LFD 88	*PG*	*23-06-12[13]*	*65/35*	*-26*	*-15*	*Not tested[11]*		*-33*	*-27*
Cryotech Deicing Technology									
Polar Plus®	*PG*	*20-01-13[9]*	*63/37*	*-27*	*-17*	Not tested[11]		*-32*	*-26*
Polar Plus® LT	PG	24-01-21	63/37	-27	-17	Not tested[11]		-33	-27
Polar Plus® LT (80)	PG	24-06-15	70/30	-27	-17	Not tested[11]		-33	-27
Dow Chemical Company									
UCAR™ ADF Concentrate	EG	27-06-01	75/25	-36	-33	Not tested[11]		-45	-49
UCAR™ ADF XL54[15]	*EG*	*23-03-26[13]*	*as supplied*	*-33*	*-27*	*Not tested[11]*		*-33*	*-27*

TABLE 51 (CONT'D):
TYPE I FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE

(see cautions and notes on pages 76 and 77)

Fluid Name	Type of Glycol[1]	Expiry[2] (y-m-d)	Lowest Operational Use Temperature[3]						
			Dilution[4,5] (fluid/water)	low speed aerodynamic test[6]		middle speed aerodynamic test[6]		high speed aerodynamic test[6]	
				°C	°F	°C	°F	°C	°F
Dow Chemical Company									
UCAR™ PG ADF Concentrate	*PG*	*23-05-29[13]*	*65/35*	*-25*	*-13*	*Not tested[11]*		*-32*	*-26*
UCAR™ PG ADF Dilute 55/45[16]	*PG*	*23-04-16[13]*	*as supplied*	*-24*	*-11*	*Not tested[11]*		*-25*	*-13*
Gansu xiexin huineng Science and technology development Co., Ltd.[10]									
XHN-1	*PG DEG*	*19-10-04[9]*	*75/25*	*Not tested[11]*		*Not tested[11]*		*-36*	*-33*
Heilongjiang Hangjie Aero-chemical Technology Co. Ltd.[10]									
HJF-1	*EG*	*21-06-14[9]*	*65/35*	*Not tested[11]*		*Not tested[11]*		*-42*	*-44*
HOC Industries									
SafeTemp® ES Plus	PG	24-06-30	65/35	-25.5	-14	Not tested[11]		-29	-20
Inland Technologies Inc.									
DuraGly-E Type I ADF Concentrate	*EG*	*23-02-08[13]*	*60/40*	*-33*	*-27*	*Not tested[11]*		*-33*	*-27*
Inland ADF Concentrate (Multiple Location)	EG	Y-M-D[17]	75/25	-36	-33	Not tested[11]		-42.5	-45
SafeTemp® ES Plus (Multiple Location)	PG	Y-M-D[18]	65/35	-25.5	-14	Not tested[11]		-31	-24
JSC RCP Nordix									
DEFROST EG 88.1	EG	25-04-13	70/30	-40.5	-41	Not tested[11]		-44.5	-48
DEFROST PG 1	PG	23-11-21	70/30	-24.5	-12	Not tested[11]		-31.5	-25
Kilfrost Limited									
Kilfrost DF Plus	*PG*	*23-06-18[13]*	*69/31*	*-25.5*	*-14*	*Not tested[11]*		*-32*	*-26*
Kilfrost DF Plus (80)	PG	24-07-14	69/31	-26	-15	Not tested[11]		-31.5	-25
Kilfrost DF Plus (88)	*PG*	*23-06-05[9]*	*63/37*	*-25.5*	*-14*	*Not tested[11]*		*-32*	*-26*
Kilfrost Ice Clear I	*PG*	*23-04-20[13]*	*70/30*	*-26*	*-15*	*Not tested[11]*		*-33*	*-27*
LNT Solutions									
LNT E188	EG	25-08-13	70/30	-30.5	-23	Not tested[11]		-41	-42
LNT P180	PG	26-11-10	69/31	-26	-15	Not tested[11]		-32	-26
MKS DEVO KIMYA SANAYI TIC AS.									
COREICEPHOB TYPE I	PG	26-06-01	71/29	Not tested[11]		Not tested[11]		-32.5	-27

TABLE 51 (CONT'D):
TYPE I FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE

(see cautions and notes on pages 76 and 77)

Fluid Name	Type of Glycol[1]	Expiry[2] (y-m-d)	Lowest Operational Use Temperature[3]						
			Dilution[4,5] (fluid/water)	low speed aerodynamic test[6]		middle speed aerodynamic test[6]		high speed aerodynamic test[6]	
				°C	°F	°C	°F	°C	°F
Newave Aerochemical Co. Ltd.									
FCY-1A	*EG*	*23-06-04[13]*	*75/25*	*-40*	*-40*	*Not tested[11]*		*-40*	*-40*
FCY-1Bio+	EG	24-07-28	75/25	Not tested[11]		Not tested[11]		-40.5	-41
ROMCHIM PROTECT SRL									
ADD-PROTECT NG Type I	EG	26-06-01	60/40	-22	-8	Not tested[11]		-22	-8
ADD-PROTECT Type I	PG	27-06-01	70/30	-25.5	-14	Not tested[11]		-31	-24
Shaanxi Cleanway Aviation Chemical Co., Ltd									
Cleansurface I	EG	25-06-07	75/25	Not tested[11]		Not tested[11]		-40.5	-41
Cleansurface I-BIO	*EG*	*22-05-02[9]*	*75/25*	*Not tested[11]*		*Not tested[11]*		*-37*	*-35*
Topan LLC									
TOPAN TYPE I	EG	24-07-13	75/25	-35.5	-32	Not tested[11]		-42	-44
Xinjiang Zhongtian Liyang Aviation Newmaterial Technology Co., Ltd. (Formerly Xinjiang Zhongtian Liyang Chemical Technology Co., Ltd)									
Clearice-I	EG	23-10-24	60/40	Not tested[11]		Not tested[11]		-30	-22
Clearice-IB	EG	24-08-04	75/25	Not tested[11]		Not tested[11]		-43.5	-46

TABLE 52:
TYPE II FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE

(see cautions and notes on pages 76 and 77)

Fluid Name	Type of Glycol[1]	Expiry[2] (y-m-d)	Dilution (fluid/water)	Lowest Operational Use Temperature[3]				AS 9968 Viscosity[7] (mPa.s)			
				middle speed aerodynamic test[6]		high speed aerodynamic test[6]		Lowest On-Wing Viscosity[8]		Highest On-Wing Viscosity[8]	
				°C	°F	°C	°F	Manufacturer Method	Alternate Method	Manufacturer Method	Alternate Method
ABAX Industries											
ECOWING AD-2	PG	25-06-01	100/0	Not tested[11]		-27	-17	5 750 (a)	Not Available[19]	17 200 (a)	14 000 (g)
			75/25	Not tested[11]		-15	5	12 000 (c)	Not Available[19]	30 200 (c)	32 000 (g)
			50/50[9]	*Not tested[11]*		*-3*	*27*	*7 500 (a)*	*Not Available[19]*	*26 900 (c)*	*36 800 (g)*
Aviation Xi'an High-Tech Physical Chemical Co. Ltd.											
Cleanwing II	*PG*	*23-06-01[13]*	*100/0*	*Not tested[11]*		*-25*	*-13*	*4 650 (d)*	*4 500 (a)*	*13 500 (a)*	*11 100 (h)*
			75/25	*Not tested[11]*		*-15*	*5*	*9 450 (d)*	*10 000 (a)*	*14 600 (h)*	*Not Available[19]*
			50/50	*Not tested[11]*		*-4.5*	*24*	*10 150 (d)*	*10 200 (a)*	*12 900 (h)*	*Not Available[19]*
Clariant Produkte (Deutschland) GmbH											
Safewing MP II FLIGHT	PG	24-05-19	*100/0*	Not tested[11]		-29	-20	3 340 (a)	Not Available[19]	20 500 (r)	20 500 (c)
			75/25	Not tested[11]		-14	7	12 900 (c)	Not Available[19]	47 800 (r)	47 800 (c)
			50/50	Not tested[11]		-3.5	26	11 500 (a)	Not Available[19]	63 000 (r)	63 000 (c)
Safewing MP II FLIGHT PLUS	*PG*	*20-02-26[9]*	*100/0*	*Not tested[11]*		*-29*	*-20*	*3 650 (p)*	*3 100 (a)*	*14 100 (h)*	*18 800 (c)*
			75/25	*Not tested[11]*		*-14.5*	*6*	*12 400 (p)*	*10 450 (a)*	*31 200 (h)*	*Not Available[19]*
			50/50	*Not tested[11]*		*-4*	*25*	*7 800 (p)*	*7 050 (a)*	*11 600 (h)*	*Not Available[19]*
Cryotech Deicing Technology											
Polar Guard® II	PG	25-06-01	100/0	Not tested[11]		-30.5	-23	4 400 (e)	4 050 (a)	17 000 (e)	16 200 (a)
			75/25	Not tested[11]		-14	7	11 600 (e)	9 750 (a)	38 000 (c)	Not Available[19]
			50/50	Not tested[11]		-3.5	26	80 (a)	Not Available[19]	48 000 (c)	Not Available[19]
JSC RCP Nordix											
Defrost PG 2	*PG*	*20-06-27[9]*	*100/0*	*Not tested[11]*		*-27*	*-17*	*4 450 (a)*	*Not Available[19]*	*6 400 (a)*	*Not Available[19]*
			75/25	*Not tested[11]*		*-16*	*3*	*8 000 (a)*	*Not Available[19]*	*7 700 (h)*	*Not Available[19]*
			50/50	*Not tested[11]*		*-4*	*25*	*17 900 (g)*	*25 400 (c)*	*24 600 (h)*	*Not Available[19]*
Kilfrost Limited											
ABC-K Plus	PG	25-06-01	100/0	Not tested[11]		-29	-20	2 850 (d)	2 640 (a)	13 400 (a)	Not Available[19]
			75/25	Not tested[11]		-14.5	6	12 650 (d)	12 650 (c)	29 000 (c)	20 700 (h)
			50/50	Not tested[11]		-3.5	26	4 200 (d)	5 260 (a)	15 000 (a)	10 900 (h)

TABLE 52 (CONT'D):
TYPE II FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE

(see cautions and notes on pages 76 and 77)

Fluid Name	Type of Glycol[1]	Expiry[2] (y-m-d)	Dilution (fluid/water)	Lowest Operational Use Temperature[3]				AS 9968 Viscosity[7] (mPa.s)			
				middle speed aerodynamic test[6]		high speed aerodynamic test[6]		Lowest On-Wing Viscosity[8]		Highest On-Wing Viscosity[8]	
				°C	°F	°C	°F	Manufacturer Method	Alternate Method	Manufacturer Method	Alternate Method
Kilfrost Limited											
Ice Clear II	PG	24-06-06	100/0	Not tested[11]		-28	-18	4 100 (a)	18 000 (l)	26 000 (c)	20 700 (h)
			75/25	Dilution Not Applicable				Dilution Not Applicable			
			50/50	Dilution Not Applicable				Dilution Not Applicable			
MKS DEVO KIMYA SANAYI TIC AS.											
COREICEPHOB Type II	PG	24-05-26	100/0	Not tested[11]		-27	-17	45 600 (h)	Not Available[19]	50 200 (h)	Not Available[19]
			75/25	Dilution Not Applicable				Dilution Not Applicable			
			50/50	Not tested[11]		-3.5	26	26 000 (h)	Not Available[19]	30 700 (h)	Not Available[19]
Newave Aerochemical Co. Ltd.											
FCY-2	*PG*	*23-07-08[13]*	*100/0*	*Not tested[11]*		*-28*	*-18*	*7 000 (d)*	*8 920 (a)*	*24 800 (c)*	*Not Available[19]*
			75/25	*Not tested[11]*		*-14.5*	*6*	*18 550 (d)*	*18 550 (c)*	*31 300 (h)*	*Not Available[19]*
			50/50	*Not tested[11]*		*-4.5*	*24*	*6 750 (d)*	*7 030 (a)*	*15 200 (h)*	*Not Available[19]*
ROMCHIM PROTECT SRL											
ADD-PROTECT NG Type II	PG	25-06-01	100/0	Not tested[11]		-28	-18	5 200 (a)	Not Available[19]	12 400 (a)	Not Available[19]
			75/25	Not tested[11]		-14.5	6	8 250 (a)	Not Available[19]	43 800 (h)	Not Available[19]
			50/50	Not tested[11]		-3	27	5 850 (a)	Not Available[19]	38 900 (h)	Not Available[19]
ADD-PROTECT Type II	PG	25-06-01	100/0	Not tested[11]		-28	-18	4 000 (a)	Not Available[19]	18 250 (a)	12 900 (h)
			75/25	Not tested[11]		-14	7	7 700 (a)	Not Available[19]	23 300 (c)	23 200 (h)
			50/50	Not tested[11]		-3	27	14 500 (a)	Not Available[19]	31 400 (c)	22 600 (h)

TABLE 53:
TYPE III FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE

(see cautions and notes on pages 76 and 77)

Fluid Name	Type of Glycol[1]	Expiry[2] (y-m-d)	Dilution (fluid/water)	Lowest Operational Use Temperature[3]						AS 9968 Viscosity[7] (mPa.s)			
				low speed aerodynamic test[6]		middle speed aerodynamic test[6]		high speed aerodynamic test[6]		Lowest On-Wing Viscosity[8]		Highest On-Wing Viscosity[8]	
				°C	°F	°C	°F	°C	°F	Manufacturer Method	Alternate Method	Manufacturer Method	Alternate Method
AllClear Systems LLC[10]													
AeroClear MAX	*EG*	*23-03-24[9]*	*100/0*	*-16*	*3*	*-20.5*	*-5*	*-35*	*-31*	*7 800 (n)*	*Not Available[19]*	*15 000 (n)*	*Not Available[19]*
			75/25	*Dilution Not Applicable*						*Dilution Not Applicable*			
			50/50	*Dilution Not Applicable*						*Dilution Not Applicable*			

TABLE 54:
TYPE IV FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE

(see cautions and notes on pages 76 and 77)

Fluid Name	Type of Glycol[1]	Expiry[2] (y-m-d)	Dilution (fluid/water)	Lowest Operational Use Temperature[3]				AS 9968 Viscosity[7] (mPa.s)			
				middle speed aerodynamic test[6]		high speed aerodynamic test[6]		Lowest On-Wing Viscosity[8]		Highest On-Wing Viscosity[8]	
				°C	°F	°C	°F	Manufacturer Method	Alternate Method	Manufacturer Method	Alternate Method
ABAX Industries											
ECOWING AD-49	PG	24-03-01	100/0	Not tested[11]		-26	-15	12 150 (g)	11 000 (a)	22 400 (g)	25 900 (c)
			75/25	Dilution Not Applicable				Dilution Not Applicable			
			50/50	Dilution Not Applicable				Dilution Not Applicable			
ALAB International											
PROFLIGHT EG4	EG	25-06-01	100/0	Not tested[11]		-26	-15	1 840 (a)	Not Available[19]	6 180 (a)	Not Available[19]
			75/25	Dilution Not Applicable				Dilution Not Applicable			
			50/50	Dilution Not Applicable				Dilution Not Applicable			
AllClear Systems LLC[10]											
ClearWing ECO	*PG*	*23-03-29[9]*	*100/0*	*Not tested[11]*		*-26*	*-15*	*37 600 (k)*	*42 000 (c)*	*30 600 (h)*	*51 900 (c)*
			75/25	*Dilution Not Applicable*				*Dilution Not Applicable*			
			50/50	*Dilution Not Applicable*				*Dilution Not Applicable*			
ClearWing EG	*EG*	*23-03-17[9]*	*100/0*	*Not tested[11]*		*-29*	*-20*	*35 500 (m)*	*13 350 (a)*	*51 800 (j)*	*Not Available[19]*
			75/25	*Dilution Not Applicable*				*Dilution Not Applicable*			
			50/50	*Dilution Not Applicable*				*Dilution Not Applicable*			
ASGlobal											
4Flite EG	EG	24-07-15	100/0	Not tested[11]		-30	-22	6 600 (a)	Not Available[19]	17 300 (a)	Not Available[19]
			75/25	Dilution Not Applicable				Dilution Not Applicable			
			50/50	Dilution Not Applicable				Dilution Not Applicable			
4Flite PG	*PG*	*23-06-29[13]*	*100/0*	*Not tested[11]*		*-26*	*-15*	*26 100 (c)*	*Not Available[19]*	*36 500 (c)*	*Not Available[19]*
			75/25	*Dilution Not Applicable*				*Dilution Not Applicable*			
			50/50	*Dilution Not Applicable*				*Dilution Not Applicable*			
AVIAFLUID International Ltd											
AVIAFlight EG	*EG*	*22-04-28[9]*	*100/0*	*Not tested[11]*		*-31*	*-24*	*5 600 (a)*	*Not Available[19]*	*12 800 (a)*	*11 200 (h)*
			75/25	*Dilution Not Applicable*				*Dilution Not Applicable*			
			50/50	*Dilution Not Applicable*				*Dilution Not Applicable*			
AVIAFlight PG	*PG*	*23-07-01[9]*	*100/0*	*Not tested[11]*		*-25.5*	*-14*	*28 600 (c)*	*Not Available[19]*	*35 900 (c)*	*22 200 (h)*
			75/25	*Dilution Not Applicable*				*Dilution Not Applicable*			
			50/50	*Dilution Not Applicable*				*Dilution Not Applicable*			

TABLE 54 (CONT'D):
TYPE IV FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE

(see cautions and notes on pages 76 and 77)

Fluid Name	Type of Glycol[1]	Expiry[2] (y-m-d)	Dilution (fluid/water)	Lowest Operational Use Temperature[3]				AS 9968 Viscosity[7] (mPa.s)			
				middle speed aerodynamic test[6]		high speed aerodynamic test[6]		Lowest On-Wing Viscosity[8]		Highest On-Wing Viscosity[8]	
				°C	°F	°C	°F	Manufacturer Method	Alternate Method	Manufacturer Method	Alternate Method
CHEMCO Inc.											
ChemR EG IV	*EG*	*23-04-07[9]*	*100/0*	*Not tested[11]*		*-27*	*-17*	*46 400 (l)*	*19 450 (c)*	*67 000 (l)*	*Not Available[19]*
			75/25	*Dilution Not Applicable*				*Dilution Not Applicable*			
			50/50	*Dilution Not Applicable*				*Dilution Not Applicable*			
ChemR Nordik IV	EG	25-06-01	100/0	Not tested[11]		-29	-20	60 800 (m)	43 100 (c)	87 100 (m)	Not Available[19]
			75/25	Dilution Not Applicable				Dilution Not Applicable			
			50/50	Dilution Not Applicable				Dilution Not Applicable			
Clariant Produkte (Deutschland) GmbH											
Max Flight AVIA	*EG*	*22-12-18[9]*	*100/0*	*Not tested[11]*		*-28.5*	*-19*	*1 000 (o)*	*Not Available[19]*	*7 650 (a)*	*Not Available[19]*
			75/25	*Dilution Not Applicable*				*Dilution Not Applicable*			
			50/50	*Dilution Not Applicable*				*Dilution Not Applicable*			
Max Flight SNEG	*PG*	*22-06-09[9]*	*100/0*	*Not tested[11]*		*-29*	*-20*	*8 700 (q)*	*8 050 (a)*	*17 600 (h)*	*21 700 (c)*
			75/25	*Not tested[11]*		*-14*	*7*	*20 200 (r)*	*21 800 (c)*	*35 600 (h)*	*Not Available[19]*
			50/50	*Not tested[11]*		*-3*	*27*	*13 600(r)*	*15 000 (c)*	*23 900 (h)*	*Not Available[19]*
Safewing EG IV NORTH	*EG*	*22-11-18[9]*	*100/0*	*Not tested[11]*		*-30*	*-22*	*830 (o)*	*Not Available[19]*	*6 750 (a)*	*Not Available[19]*
			75/25	*Dilution Not Applicable*				*Dilution Not Applicable*			
			50/50	*Dilution Not Applicable*				*Dilution Not Applicable*			
Safewing MP IV LAUNCH	PG	24-05-26	100/0	Not tested[11]		-28.5	-19	7 550 (a)	Not Available[19]	20 500 (r)	20 500 (c)
			75/25	Not tested[11]		-14	7	18 000 (a)	Not Available[19]	47 800 (r)	47 800 (c)
			50/50	Not tested[11]		-3.5	26	17 800 (a)	Not Available[19]	63 000 (r)	63 000 (c)
Safewing MP IV LAUNCH PLUS	*PG*	*23-03-12[13]*	*100/0*	*Not tested[11]*		*-29*	*-20*	*8 700 (q)*	*8 450 (a)*	*21 000 (r)*	*21 000 (c)*
			75/25	*Not tested[11]*		*-14*	*7*	*18 800 (r)*	*17 200 (c)*	*51 600 (r)*	*51 600 (c)*
			50/50	*Not tested[11]*		*-3.5*	*26*	*9 700 (q)*	*12 150 (a)*	*65 700 (r)*	*65 700 (c)*
Cryotech Deicing Technology											
Polar Guard® Advance	*PG*	*23-05-28[13]*	*100/0*	*Not tested[11]*		*-30.5*	*-23*	*4 400 (e)*	*4 050 (a)*	*17 000 (e)*	*16 200 (a)*
			75/25	*Not tested[11]*		*-14*	*7*	*11 600 (e)*	*9 750 (a)*	*38 000 (c)*	*Not Available[19]*
			50/50	*Not tested[11]*		*-3.5*	*26*	*80 (a)*	*Not Available[19]*	*48 000 (c)*	*Not Available[19]*
Polar Guard® Xtend	PG	25-06-01	100/0	Not tested[11]		-29	-20	6 000 (e)	6 350 (a)	23 500 (e)	23 200 (c)
			75/25	Dilution Not Applicable				Dilution Not Applicable			
			50/50	Dilution Not Applicable				Dilution Not Applicable			

TABLE 54 (CONT'D):
TYPE IV FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE

(see cautions and notes on pages 76 and 77)

Fluid Name	Type of Glycol[1]	Expiry[2] (y-m-d)	Dilution (fluid/water)	Lowest Operational Use Temperature[3]				AS9968 Viscosity[7] (mPa.s)			
				middle speed aerodynamic test[6]		high speed aerodynamic test[6]		Lowest On-Wing Viscosity[8]		Highest On-Wing Viscosity[8]	
				°C	°F	°C	°F	Manufacturer Method	Alternate Method	Manufacturer Method	Alternate Method
Dow Chemical Company											
UCAR ENDURANCE™ EG106 ADF/AAF	EG	25-06-01	100/0	Not tested[11]		-29	-20	24 850 (i)	2 230 (a)	47 800 (i)	5 900 (a)
			75/25	Dilution Not Applicable				Dilution Not Applicable			
			50/50	Dilution Not Applicable				Dilution Not Applicable			
UCAR™ FLIGHTGUARD™ AD-49	*PG*	*23-05-27[13]*	*100/0*	*Not tested[11]*		*-26*	*-15*	*12 150 (g)*	*11 000 (a)*	*22 400 (g)*	*25 900 (c)*
			75/25	*Dilution Not Applicable*				*Dilution Not Applicable*			
			50/50	*Dilution Not Applicable*				*Dilution Not Applicable*			
Inland Technologies Inc.											
ECO-SHIELD®	PG	24-10-28	100/0	Not tested[11]		-25.5	-14	11 050 (a)	Not Available[19]	25 800 (h)	34 500 (c)
			75/25	Dilution Not Applicable				Dilution Not Applicable			
			50/50	Dilution Not Applicable				Dilution Not Applicable			
JSC RCP Nordix											
Defrost ECO 4	*PG*	23-08-12	100/0	Not tested[11]		-25.5	-14	9 800 (g)	12 350 (a)	14 800 (h)	13 700 (c)
			75/25	Dilution Not Applicable				Dilution Not Applicable			
			50/50	Dilution Not Applicable				Dilution Not Applicable			
Defrost NORTH 4	*EG*	*23-06-01[9]*	*100/0*	*Not tested[11]*		*-26*	*-15*	*2 500 (a)*	*Not Available[19]*	*5 350 (a)*	*Not Available[19]*
			75/25	*Dilution Not Applicable*				*Dilution Not Applicable*			
			50/50	*Dilution Not Applicable*				*Dilution Not Applicable*			
Kilfrost Limited											
ABC-S Plus	*PG*	*23-06-09[13]*	*100/0*	*Not tested[11]*		*-28*	*-18*	*17 900 (d)*	*17 900 (c)*	*43 800 (c)*	*32 000 (h)*
			75/25	*Not tested[11]*		*-14.5*	*6*	*18 300 (d)*	*18 300 (c)*	*58 000 (c)*	*40 200 (h)*
			50/50	*Not tested[11]*		*-3.5*	*26*	*7 500 (d)*	*7 500 (a)*	*27 000 (c)*	*21 200 (h)*
Newave Aerochemical Co. Ltd.											
FCY 9311	PG	24-12-09	100/0	Not tested[11]		-29.5	-21	14 100 (c)	Not Available[18]	27 600 (c)	25 700 (h)
			75/25	Dilution Not Applicable				Dilution Not Applicable			
			50/50	Dilution Not Applicable				Dilution Not Applicable			
FCY-EGIV	EG	24-07-05	100/0	Not tested[11]		-29	-20	24 800 (f)	6 300 (a)	43 700 (j)	78 000 (c)
			75/25	Dilution Not Applicable				Dilution Not Applicable			
			50/50	Dilution Not Applicable				Dilution Not Applicable			

CAUTIONS AND NOTES FOR TABLES 51, 52, 53, 54

CAUTIONS

- These tables list fluids that have been tested with respect to endurance time performance (Holdover Times), anti-icing performance (Water Spray Endurance Testing/High Humidity Endurance Testing) and aerodynamic acceptance (Type I: SAE ARP6207 §3.4.1, AMS1424 §3.5.2 and §3.5.3; Type II/ III/ IV: SAE ARP5718 §FOREWARD, AMS1428 §3.2.4 and §3.2.5) only. These tests were conducted by APS Aviation Inc. (www.apsaviation.ca) and Anti-icing Materials International Laboratory (AMIL) (www.uqac.ca/amil). The end user is responsible for contacting the fluid manufacturer to confirm all other SAE AMS1424/1428 technical requirement tests, such as fluid stability, toxicity, materials compatibility, etc. have been conducted. These technical requirement tests are typically conducted by Scientific Material International (SMI) (www.smiinc.com) and AMIL, or any acceptable source.
- LOUT data provided in these tables is based strictly on the manufacturer's data; the end user is responsible for verifying the validity of this data.
- Type I fluids supplied in concentrated form must not be used in that form and must be diluted.

NOTES

1 PG = conventional glycol (propylene glycol); EG = conventional glycol (ethylene glycol); DEG = conventional glycol (diethylene glycol); NCG = non-conventional glycol (organic non-ionic diols and triols, e.g. 1,3-propanediol, glycerine) and mixtures of non-conventional glycol and conventional glycol; NG = non-glycol (e.g. organic salts) and mixtures of non-glycol and glycol.

2 Expiry date is the earlier expiry date of the Aerodynamic Test(s) or Water Spray Endurance Test. Fluids that are tested after the issuance of this list will appear in a later update.

3 The values in this table were determined using test results from pre-production fluid samples when available. In some cases, the fluid manufacturer requested the publication of a more conservative value than the pre-production test value. The lowest operational use temperature (LOUT) for a given fluid is the higher (warmer) of:

a) The lowest temperature at which the fluid meets the aerodynamic acceptance test for a given aircraft type; or
b) The actual freezing point of the fluid plus its freezing point buffer (Type I = 10 °C/18 °F; Type II/III/IV = 7 °C/13 °F).

Note: LOUTs are rounded to the nearest half degree Celsius and the values in degrees Fahrenheit are calculated to the nearest whole degree.

4 The LOUT for Type I fluids that are intended to be diluted is derived from a dilution that provides the lowest operational use temperature. For other Type I dilutions, determine the freezing point of the fluid and add a 10 °C freezing point buffer, as a dilution will usually yield a higher and more restrictive operational use temperature. Consult the fluid manufacturer or fluid documentation for further clarification and guidance on establishing the appropriate operational use temperature of a diluted fluid.

5 Type I concentrate fluids have also been tested at 50/50 (glycol/water) dilution.

6 If uncertain whether the aircraft to be treated conforms to the low speed, the middle speed, or the high speed aerodynamic test, consult the aircraft manufacturer. The aerodynamic test is defined in SAE AS5900 (latest version).

7 The Alternate viscosity method should only be used for field verification and auditing purposes; when in doubt as to which method is appropriate, use the manufacturer method. Viscosity measurement methods are indicated as letters (in parentheses) beside each viscosity value. Details of each measurement method are shown in the table on the following page. The exact measurement method (spindle, container, fluid volume, temperature, speed, duration) must be used to compare the viscosity of a sample to a viscosity given in this table.

8 The lowest on-wing viscosity (LOWV), and highest on-wing viscosity (HOWV) values in this table are those of the fluids provided by the manufacturers for holdover time testing, and initial qualification aerodynamic testing. For the holdover times and lowest operation use temperature to be valid, the viscosity of the fluid on the wing shall not be lower than the LOWV value in this table and higher than the HOWV value in this table. The user should periodically ensure that the viscosity of a fluid sample taken from the wing surface complies with these limits.

9 Aerodynamic Performance and Anti-Icing Performance test data has expired; fluids listed in italics will be removed from this listing four years after expiry.

10 Manufacturer has not provided fluid information as required in SAE ARP5718B; fluid may be removed from this listing in subsequent revisions.

11 Manufacturer has indicated fluid was not tested.

12 For DeiceX PG ADF Concentrate, refer to primary site qualification of UCAR™ PG ADF Concentrate.

13 Currently in the test/re-test process. Contact the fluid manufacturer for latest information (see Appendix C for latest available contact information).

14 Fluid was not retested for low speed aerodynamics. This data will be removed four years after the expiry of the last low speed test.

15 For UCAR™ ADF XL54, refer to primary site qualification of UCAR™ ADF Concentrate.

16 For UCAR™ PG ADF Dilute 55/45, refer to primary site qualification of UCAR™ PG ADF Concentrate.

17 Dow UCAR™ ADF Concentrate, sold under the product name Inland ADF Concentrate, qualified from 2015-09-04.

18 Refer to preproduction qualification of SafeTemp® ES Plus submitted by HOC Industries, qualified from 2017-11-20.

19 Manufacturer has not provided an alternate method for measuring viscosity. Please use the Manufacturer Method.

TABLE 55:
VISCOSITY MEASUREMENT METHODS FOR TYPE II, III, AND IV FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE

Method	Brookfield Spindle*	Container	Fluid Volume	Temp.**	Speed	Duration
a	LV1 (with guard leg)	600 mL low form (Griffin) beaker	575 mL***	20 °C	0.3 rpm	10.0 minutes
b	LV1 (with guard leg)	600 mL low form (Griffin) beaker	575 mL***	20 °C	0.3 rpm	33.3 minutes
c	LV2-disc (with guard leg)	600 mL low form (Griffin) beaker	425 mL***	20 °C	0.3 rpm	10.0 minutes
d	LV2-disc (with guard leg)	150 mL tall form (Berzelius) beaker	135 mL***	20 °C	0.3 rpm	10.0 minutes
e	SC4-34/13R	small sample adapter	10 mL	20 °C	0.3 rpm	10.0 minutes
f	SC4-34/13R	small sample adapter	10 mL	0 °C	0.3 rpm	30.0 minutes
g	SC4-31/13R	small sample adapter	10 mL	20 °C	0.3 rpm	10.0 minutes
h	SC4-31/13R	small sample adapter	10 mL	20 °C	0.3 rpm	30.0 minutes
i	SC4-31/13R	small sample adapter	10 mL	0 °C	0.3 rpm	10.0 minutes
j	SC4-31/13R	small sample adapter	10 mL	0 °C	0.3 rpm	30.0 minutes
k	SC4-31/13R	small sample adapter	9 mL	20 °C	0.3 rpm	15.0 minutes
l	SC4-31/13R	small sample adapter	9 mL	0 °C	0.3 rpm	10.0 minutes
m	SC4-31/13R	small sample adapter	9 mL	0 °C	0.3 rpm	30.0 minutes
n	SC4-31/13R	small sample adapter	9 mL	0 °C	0.3 rpm	65.0 minutes
o	LV0	ultra low adapter	16 mL	20 °C	0.3 rpm	10.0 minutes
p	LV1	big sample adapter	50 mL	20 °C	0.3 rpm	10.0 minutes
q	LV1	big sample adapter	55 mL	20 °C	0.3 rpm	10.0 minutes
r	LV2-disc	big sample adapter	60 mL	20 °C	0.3 rpm	10.0 minutes

* Spindle must be attached to a Brookfield viscometer model equipped with an LV spring.

** Sample temperature will affect readings; ensure sufficient time is allowed for sample to reach thermal equilibrium before starting test. Use of a cooling bath strongly recommended.

*** If necessary, adjust fluid volume to ensure fluid is level with notch on the spindle shaft.

TABLE 56: GUIDELINES FOR THE APPLICATION OF SAE TYPE I FLUID

<table>
<tr><th rowspan="2">Outside Air Temperature (OAT)[1]</th><th rowspan="2">One-Step Procedure De/Anti-icing[2]</th><th colspan="2">Two-Step Procedure</th></tr>
<tr><th>First Step: Deicing</th><th>Second Step: Anti-icing[3]</th></tr>
<tr><td>0 °C (32 °F) and above</td><td rowspan="2">Fluid/water mixture heated to at least 60°C (140°F) at the nozzle with a freezing point of at least 10°C (18°F) below OAT</td><td>Heated water or a heated fluid/water mixture</td><td rowspan="2">Fluid/water mixture heated to at least 60°C (140°F) at the nozzle with a freezing point of at least 10°C (18°F) below OAT</td></tr>
<tr><td>Below 0 °C (32 °F) to LOUT</td><td>Heated fluid/water mixture with a freezing point at OAT or below</td></tr>
</table>

NOTES

1 Fluids must not be used at temperatures below their lowest operational use temperature (LOUT).

2 When anti-icing using the one-step procedure, a minimum quantity of 1 litre/m^2 (~2 gal./100 sq. ft.) of Type I fluid mixture heated to at least 60°C (140°F) is required after all frozen contamination is removed. This is achieved using a continuous process. This application is necessary to heat the surfaces, as heat contributes significantly to the Type I fluid holdover times.

3 To be applied before first-step fluid freezes, typically within 3 minutes. This time may be higher than 3 minutes in some conditions, but potentially lower in heavy precipitation, colder temperatures, or for critical surfaces constructed of composite materials. If necessary, the second step shall be applied area by area (sectionally).

CAUTIONS

- This table is applicable for the use of Type I holdover time guidelines in all conditions, including active frost. If holdover times are not required, a temperature of 60 °C (140 °F) at the nozzle is desirable.
- If holdover times are required, the temperature of water or fluid/water mixtures shall be at least 60 °C (140 °F) at the nozzle. Upper temperature limit shall not exceed fluid and aircraft manufacturers' recommendations.
- To use Type I Holdover Times Guidelines in all conditions including active frost, an additional minimum of 1 liter/m^2 (~2 gal./100 sq. ft.) of heated Type I fluid mixture must be applied to the surfaces after all frozen contamination is removed. This application is necessary to heat the surfaces, as heat contributes significantly to the Type I fluid holdover times. The required protection can be provided using a 1-step method by applying more fluid than is strictly needed to just remove all of the frozen contamination (the same additional amount stated above is required).
- The lowest operational use temperature (LOUT) for a given Type I fluid is the higher (warmer) of:
    a) The lowest temperature at which the fluid meets the aerodynamic acceptance test for a given aircraft type; or
    b) The actual freezing point of the fluid plus a freezing point buffer of 10 °C (18 °F).
- Wing skin temperatures may be colder or warmer than the OAT. Causes can include: radiation cooling, cold-soaked wing, or hangar storage. Consult the appropriate guidance (HOT Tables and FAA Ground Deicing General Information Document, Winter 2023-2024") for the contaminant in question.
- When conducting aircraft deicing using a Type I fluid and not using the 10 °C/18 °F buffer, procedures must be developed and approved to ensure refreezing does not occur prior to takeoff.

TABLE 57: GUIDELINES FOR THE APPLICATION OF SAE TYPE II AND IV FLUID

(FLUID CONCENTRATIONS IN % VOLUME)

Outside Air Temperature (OAT)[1]	One-Step Procedure De/Anti-icing	Two-Step Procedure	
		First Step: Deicing	Second Step: Anti-icing[2]
0 °C (32 °F) and above	100/0, 75/25 or 50/50 Heated[3] Type II or IV fluid/water mixture	Heated water or a heated Type I, II, III, or IV fluid/water mixture	100/0, 75/25 or 50/50 Heated or unheated Type II or IV fluid/water mixture
Below 0 °C (32 °F) to -3 °C (27 °F)	100/0, 75/25 or 50/50 Heated[3] Type II or IV fluid/water mixture	Heated Type I, II, III, or IV fluid/water mixture with a freezing point at OAT or below	100/0, 75/25 or 50/50 Heated or unheated Type II or IV fluid/water mixture
Below -3 °C (27 °F) to -14 °C (7 °F)	100/0 or 75/25 Heated[3] Type II or IV fluid/water mixture	Heated Type I, II, III, or IV fluid/water mixture with a freezing point at OAT or below	100/0 or 75/25 Heated or unheated Type II or IV fluid/water mixture
Below -14 °C (7 °F) to LOUT	100/0 Heated[3] Type II or IV fluid	Heated Type I, II, III, or IV fluid/water mixture with a freezing point at OAT or below	100/0 Heated or unheated Type II or IV fluid

NOTES

1 Fluids used for the anti-icing procedure must not be used at temperatures below their lowest operational use temperature (LOUT). First step fluids must not be used below their freezing points. Consideration should be given to the use of Type I/III fluid when Type II/IV fluid cannot be used due to LOUT limitations (see Tables 55 and 57). The LOUT for a given Type II/IV fluid is the higher (warmer) of:

a) The lowest temperature at which the fluid meets the aerodynamic acceptance test for a given aircraft type; or
b) The actual freezing point of the fluid plus its freezing point buffer of 7 °C (13 °F).

Although some LOUTs are lower than the temperatures stated in the HOT table, holdover times do not apply when anti-icing below the lowest temperature stated in the band.

2 To be applied before first step fluid freezes, typically within 3 minutes. Time may be longer than 3 minutes in some conditions, but potentially shorter in heavy precipitation, colder temperatures, or for critical surfaces constructed of composite materials. If necessary, the second step shall be applied area by area (sectionally).

3 Clean aircraft may be anti-iced with unheated fluid.

CAUTIONS

- For heated fluids, a fluid temperature not less than 60 °C (140 °F) at the nozzle is desirable.
- Upper temperature limit shall not exceed fluid and aircraft manufacturers' recommendations.
- Wing skin temperatures may be colder or warmer than the OAT. Causes can include: radiation cooling, cold-soaked wing, or hangar storage. Consult the appropriate guidance (HOT Tables and FAA Ground Deicing General Information Document, Winter 2023-2024") for the contaminant in question.
- Whenever frost or ice occurs on the lower surface of the wing in the area of the fuel tank, indicating a cold-soaked wing, the 50/50 dilutions of Type II or IV shall not be used for the anti-icing step because fluid freezing may occur.
- An insufficient amount of anti-icing fluid may cause a substantial loss of holdover time. This is particularly true when using a Type I fluid mixture for the first step in a two-step procedure.
- When conducting aircraft deicing using a Type I fluid and not using the 10 °C/18 °F buffer, procedures must be developed and approved to ensure refreezing does not occur prior to takeoff.

TABLE 58: GUIDELINES FOR THE APPLICATION OF UNHEATED SAE TYPE III FLUID

(FLUID CONCENTRATIONS IN % VOLUME)

Outside Air Temperature (OAT)[1]	Anti-icing Only[4]	Two-Step Procedure	
		First Step: Deicing	Second Step: Anti-icing[2]
0 °C (32 °F) and above	100/0, 75/25 or 50/50 Unheated Type III fluid/water mixture	Heated[3] water or a heated[3] Type I, II, III, or IV fluid/water mixture	100/0, 75/25 or 50/50 Unheated Type III fluid/water mixture
Below 0 °C (32 °F) to -3 °C (27 °F)	100/0, 75/25 or 50/50 Unheated Type III fluid/water mixture	Heated[3] Type I, II, III, or IV fluid/water mixture with a freezing point at OAT or below	100/0, 75/25 or 50/50 Unheated Type III fluid/water mixture
Below -3 °C (27 °F) to -10 °C (14 °F)	100/0 or 75/25 Unheated Type III fluid/water mixture	Heated[3] Type I, II, III, or IV fluid/water mixture with a freezing point at OAT or below	100/0 or 75/25 Unheated Type III fluid/water mixture
Below -10 °C (14 °F) to LOUT	100/0 Unheated Type III fluid	Heated[3] Type I, II, III, or IV fluid/water mixture with a freezing point at OAT or below	100/0 Unheated Type III fluid

NOTES

1 Fluids used for the anti-icing procedure must not be used at temperatures below their lowest operational use temperature (LOUT). First step fluids must not be used below their freezing points. Consider the use of Type I when Type III fluid cannot be used (see Table 56). The LOUT for a given Type III fluid is the higher (warmer) of:

a) The lowest temperature at which the fluid meets the aerodynamic acceptance test for a given aircraft type; or
b) The actual freezing point of the fluid plus its freezing point buffer of 7 °C (13 °F).

Although the LOUTs may be lower than the temperatures stated in the HOT table, holdover times do not apply when anti-icing below the lowest temperature stated in the band.

2 To be applied before first step fluid freezes, typically within 3 minutes. This time may be longer than 3 minutes in some conditions, but potentially shorter in heavy precipitation, colder temperatures, or for critical surfaces constructed of composite materials. If necessary, the second step shall be applied area by area (sectionally).

3 For heated fluids, a fluid temperature not less than 60 °C (140 °F) at the nozzle is desirable.

4 Anti-icing only with unheated Type III fluid is only possible on a clean aircraft. If deicing is required, a two-step procedure must be used.

CAUTIONS

- Upper temperature limit shall not exceed fluid and aircraft manufacturers' recommendations.
- Wing skin temperatures may be colder or warmer than the OAT. Causes can include: radiation cooling, cold-soaked wing, or hangar storage. Consult the appropriate guidance (HOT Tables and FAA Ground Deicing General Information Document, Winter 2023-2024") for the contaminant in question.
- Whenever frost or ice occurs on the lower surface of the wing in the area of the fuel tank, indicating a cold-soaked wing, the 50/50 dilutions of Type III shall not be used for the anti-icing step because fluid freezing may occur.
- An insufficient amount of anti-icing fluid may cause a substantial loss of holdover time. This is particularly true when using a Type I fluid mixture for the first step in a two-step procedure.
- When conducting aircraft deicing using a Type I fluid and not using the 10 °C/18 °F buffer, procedures must be developed and approved to ensure refreezing does not occur prior to takeoff.

APPENDIX A:
ADJUSTED HOLDOVER TIME (HOT) GUIDELINES

These tables are for use when flaps/slats are deployed prior to de/anti-icing. Holdover and allowance times have been adjusted to 76 percent of standard times. Standard holdover and allowance times can be used if flaps and slats are deployed as close to departure as safety allows.

Note: Industry data indicates the possibility of increased takeoff misconfigurations when the selection of takeoff flaps is delayed later in the taxi regime. If an air carrier chooses to select the flaps/slats to the takeoff configuration prior to beginning the anti-icing process, operators should have robust procedures in place to ensure that the aircraft is properly configured prior to takeoff. Air Carriers should follow the airframe manufacturer's recommended procedures regarding anti-icing operations and the configuration of flaps/slats while taxiing.

ADJUSTED HOLDOVER TIME (HOT) GUIDELINES FOR WINTER 2023-2024

ADJUSTED ACTIVE FROST HOT GUIDELINES
WINTER 2023-2024

The HOT Guidelines are provided for information and guidance purposes. The HOT Guidelines on their own do not change, create, amend or permit deviations from regulatory requirements.

The HOT Guidelines may use mandatory terms such as “must”, “shall” and “is/are required” so as to convey the intent of meeting regulatory requirements and SAE Standards, where applicable. The term “should” is to be understood, unless an alternative method of achieving safety is implemented that would meet or exceed the intent of the recommendation.

CAUTIONS

- The responsibility for the application of these data remains with the user.
- Fluids used during ground de/anti-icing do not provide in-flight icing protection.
- This table is for departure planning only and should be used in conjunction with pretakeoff check procedures

TABLE ADJ-1: ADJUSTED ACTIVE FROST HOLDOVER TIMES FOR SAE TYPE I, TYPE II, TYPE III, AND TYPE IV FLUIDS[1]

Outside Air Temperature[2,3,4]	Type I
-1 °C and above (30 °F and above)	0:34 *(0:27)*[6]
below -1 to -3 °C (below 30 to 27 °F)	
below -3 to -10 °C (below 27 to 14 °F)	
below -10 to -14 °C (below 14 to 7 °F)	
below -14 to -21 °C (below 7 to -6 °F)	
below -21 to -25 °C (below -6 to -13 °F)	
below -25 °C to LOUT (below -13 °F to LOUT)	

Outside Air Temperature[3,4]	Concentration Fluid/Water By % Volume	Type II	Type III[5]	Type IV
-1 °C and above (30 °F and above)	100/0	6:05	1:31	9:07
	75/25	3:48	0:46	3:48
	50/50	1:31	0:23	2:17
below -1 to -3 °C (below 30 to 27 °F)	100/0	6:05	1:31	9:07
	75/25	3:48	0:46	3:48
	50/50	1:08	0:23	2:17
below -3 to -10 °C (below 27 to 14 °F)	100/0	6:05	1:31	7:36
	75/25	3:02	0:46	3:48
below -10 to -14 °C (below 14 to 7 °F)	100/0	4:34	1:31	4:34
	75/25	0:46	0:46	0:46
below -14 to -21 °C (below 7 to -6 °F)	100/0	2:17	1:31	4:34
below -21 to -25 °C (below -6 to -13 °F)	100/0	1:31	1:31	3:02
below -25 °C (below -13 °F)	100/0	No Holdover Time Guidelines Exist		

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 To use the HOTs in this table, ensure that the fluid and dilution being used is listed in the List of Qualified Fluids Tested for Anti-Icing Performance and Aerodynamic Acceptance table (Table 51 - Table 54). Any restrictions on the use of the fluid have to be identified and applied.
2 Type I Fluid / Water Mixture must be selected so that the freezing point of the mixture is at least 10 °C (18 °F) below outside air temperature.
3 Ensure that the lowest operational use temperature (LOUT) is respected.
4 Changes in outside air temperature (OAT) over the course of longer frost events can be significant; the appropriate holdover time to use is the one provided for the coldest OAT that has occurred in the time between the de/anti-icing fluid application and takeoff.
5 To use the Type III fluid frost holdover times, the fluid brand being used must be known. AllClear AeroClear MAX must be applied unheated.
6 Value in parentheses is for aircraft with critical surfaces that are predominantly or entirely constructed of composite materials.

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-4.

ADJUSTED HOT GUIDELINES FOR SAE TYPE I FLUIDS
WINTER 2023-2024

The HOT Guidelines are provided for information and guidance purposes. The HOT Guidelines on their own do not change, create, amend or permit deviations from regulatory requirements.

The HOT Guidelines may use mandatory terms such as “must”, “shall” and “is/are required” so as to convey the intent of meeting regulatory requirements and SAE Standards, where applicable. The term “should” is to be understood, unless an alternative method of achieving safety is implemented that would meet or exceed the intent of the recommendation.

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The time of protection will be shortened in heavy weather conditions. Heavy precipitation rates or high moisture content, high wind velocity, or jet blast may reduce holdover time below the lowest time stated in the range. Holdover time may be reduced when aircraft skin temperature is lower than outside air temperature.
- Fluids used during ground de/anti-icing do not provide in-flight icing protection.
- This table is for departure planning only and should be used in conjunction with pretakeoff check procedures

TABLE ADJ-2: ADJUSTED HOLDOVER TIMES FOR SAE TYPE I FLUID ON CRITICAL AIRCRAFT SURFACES COMPOSED PREDOMINANTLY OF ALUMINUM

Outside Air Temperature[1,2]	Freezing Fog, Freezing Mist[3], or Ice Crystals[4]	Very Light Snow, Snow Grains or Snow Pellets[5,6,7]	Light Snow, Snow Grains or Snow Pellets[5,6,7]	Moderate Snow, Snow Grains or Snow Pellets[5,7]	Freezing Drizzle[8]	Light Freezing Rain	Rain on Cold-Soaked Wing[9]	Other[10]
-3 °C and above (27 °F and above)	0:08 - 0:13	0:14 - 0:17	0:08 - 0:14	0:05 - 0:08	0:07 - 0:10	0:02 - 0:04	0:02 - 0:04	
below -3 to -6 °C (below 27 to 21 °F)	0:06 - 0:10	0:11 - 0:13	0:06 - 0:11	0:04 - 0:06	0:04 - 0:07	0:02 - 0:04	CAUTION: No holdover time guidelines exist	
below -6 to -10 °C (below 21 to 14 °F)	0:05 - 0:08	0:08 - 0:10	0:05 - 0:08	0:03 - 0:05	0:03 - 0:05	0:02 - 0:04		
below -10 °C (below 14 °F)	0:04 - 0:07	0:05 - 0:06	0:03 - 0:05	0:02 - 0:03				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Type I fluid / water mixture must be selected so that the freezing point of the mixture is at least 10 °C (18 °F) below outside air temperature.
2 Ensure that the lowest operational use temperature (LOUT) is respected.
3 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
4 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
5 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
6 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
7 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
8 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
9 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
10 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-6.

TABLE ADJ-3: ADJUSTED HOLDOVER TIMES FOR SAE TYPE I FLUID ON CRITICAL AIRCRAFT SURFACES COMPOSED PREDOMINANTLY OF COMPOSITES

Outside Air Temperature[1,2]	Freezing Fog, Freezing Mist[3], or Ice Crystals[4]	Very Light Snow, Snow Grains or Snow Pellets[5,6,7]	Light Snow, Snow Grains or Snow Pellets[5,6,7]	Moderate Snow, Snow Grains or Snow Pellets[5,7]	Freezing Drizzle[8]	Light Freezing Rain	Rain on Cold-Soaked Wing[9]	Other[10]
-3 °C and above (27 °F and above)	0:07 - 0:12	0:09 - 0:11	0:05 - 0:09	0:02 - 0:05	0:06 - 0:10	0:02 - 0:04	0:01 - 0:04	
below -3 to -6 °C (below 27 to 21 °F)	0:05 - 0:06	0:08 - 0:10	0:04 - 0:08	0:02 - 0:04	0:04 - 0:07	0:02 - 0:04	CAUTION: No holdover time guidelines exist	
below -6 to -10 °C (below 21 to 14 °F)	0:03 - 0:06	0:07 - 0:09	0:04 - 0:07	0:02 - 0:04	0:03 - 0:05	0:02 - 0:04		
below -10 °C (below 14 °F)	0:03 - 0:05	0:05 - 0:06	0:03 - 0:05	0:02 - 0:03				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Type I fluid / water mixture must be selected so that the freezing point of the mixture is at least 10 °C (18 °F) below outside air temperature.
2 Ensure that the lowest operational use temperature (LOUT) is respected.
3 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
4 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
5 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
6 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
7 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
8 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
9 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
10 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-6.

ADJUSTED HOT GUIDELINES FOR SAE TYPE II FLUIDS WINTER 2023-2024

The HOT Guidelines are provided for information and guidance purposes. The HOT Guidelines on their own do not change, create, amend or permit deviations from regulatory requirements.

The HOT Guidelines may use mandatory terms such as “must”, “shall” and “is/are required” so as to convey the intent of meeting regulatory requirements and SAE Standards, where applicable. The term “should” is to be understood, unless an alternative method of achieving safety is implemented that would meet or exceed the intent of the recommendation.

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The time of protection will be shortened in heavy weather conditions. Heavy precipitation rates or high moisture content, high wind velocity, or jet blast may reduce holdover time below the lowest time stated in the range. Holdover time may be reduced when aircraft skin temperature is lower than outside air temperature.
- Fluids used during ground de/anti-icing do not provide in-flight icing protection.
- This table is for departure planning only and should be used in conjunction with pretakeoff check procedures

TABLE ADJ-4: ADJUSTED GENERIC HOLDOVER TIMES FOR SAE TYPE II FLUIDS[1]

Outside Air Temperature[2]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[3], or Ice Crystals[4]	Snow, Snow Grains or Snow Pellets[5,6,7]	Freezing Drizzle[8]	Light Freezing Rain	Rain on Cold-Soaked Wing[9]	Other[10]
-3 °C and above (27 °F and above)	100/0	0:42 - 1:24	0:23 - 0:42	0:23 - 0:46	0:15 - 0:27	0:05 - 0:34	
	75/25	0:30 - 0:53	0:11 - 0:23	0:19 - 0:30	0:11 - 0:19	0:03 - 0:19	
	50/50	0:11 - 0:23	0:05 - 0:11	0:07 - 0:11	0:05 - 0:07	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:23 - 0:34	0:15 - 0:30	0:15 - 0:34	0:11 - 0:15		
	75/25	0:19 - 0:42	0:08 - 0:19	0:11 - 0:23	0:06 - 0:11		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:23 - 0:34	0:11 - 0:23	0:15 - 0:34[11]	0:11 - 0:15[11]		
	75/25	0:19 - 0:42	0:07 - 0:15	0:11 - 0:23[11]	0:06 - 0:11[11]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:11 - 0:15	0:02 - 0:05				
below -18 to -25 °C[12] (below 0 to -13 °F)	100/0	0:11 - 0:15	0:01 - 0:02				
below -25 °C to LOUT[12] (below -13 °F to LOUT)	100/0	0:11 - 0:15	0:00 - 0:01				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 To use the HOTs in this table, ensure that the fluid and dilution being used is listed in the Type II Fluids Tested for Anti-Icing Performance and Aerodynamic Acceptance table (Table 52). Any restrictions on the use of the fluid have to be identified and applied.
2 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
3 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
4 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
5 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
6 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
7 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
8 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
9 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
10 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
11 No holdover time guidelines exist for this condition below -10 °C (14 °F).
12 If the LOUT is unknown, no holdover time guidelines exist below -25 °C (-13 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-9.

TABLE ADJ-5: ADJUSTED TYPE II HOLDOVER TIMES FOR ABAX ECOWING AD-2

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:01 - 2:17	1:50 - 2:13	0:57 - 1:50	0:30 - 0:57	0:30 - 1:16	0:23 - 0:34	0:07 - 1:05	
	75/25	0:57 - 1:05	1:20 - 1:39	0:42 - 1:20	0:19 - 0:42	0:27 - 0:49	0:15 - 0:23	0:03 - 0:38	
	50/50	0:11 - 0:23	0:27 - 0:30	0:11 - 0:27	0:05 - 0:11	0:07 - 0:11	0:05 - 0:07	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:34 - 1:54	1:31 - 1:50	0:46 - 1:31	0:23 - 0:46	0:19 - 0:53	0:15 - 0:23		
	75/25	0:27 - 1:27	1:16 - 1:35	0:38 - 1:16	0:19 - 0:38	0:11 - 0:42	0:15 - 0:27		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:34 - 1:54	1:20 - 1:35	0:42 - 1:20	0:23 - 0:42	0:19 - 0:53[10]	0:15 - 0:23[10]		
	75/25	0:27 - 1:27	1:12 - 1:31	0:38 - 1:12	0:19 - 0:38	0:11 - 0:42[10]	0:15 - 0:27[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:11 - 0:30	0:15 - 0:23	0:05 - 0:15	0:02 - 0:05				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:11 - 0:30	0:07 - 0:11	0:02 - 0:07	0:01 - 0:02				
below -25 to -27 °C (below -13 to -17 °F)	100/0	0:11 - 0:30	0:04 - 0:05	0:01 - 0:04	0:00 - 0:01				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-9.

TABLE ADJ-6: ADJUSTED TYPE II HOLDOVER TIMES FOR AVIATION XI'AN HIGH-TECH CLEANWING II

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	0:42 - 1:24	1:12 - 1:27	0:42 - 1:12	0:23 - 0:42	0:27 - 0:49	0:19 - 0:27	0:08 - 0:42	
	75/25	0:38 - 1:01	1:01 - 1:16	0:34 - 1:01	0:19 - 0:34	0:27 - 0:46	0:15 - 0:23	0:05 - 0:38	
	50/50	0:27 - 0:46	0:38 - 0:49	0:19 - 0:38	0:11 - 0:19	0:15 - 0:30	0:08 - 0:15	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:34 - 1:24	1:01 - 1:12	0:30 - 1:01	0:19 - 0:30	0:23 - 0:42	0:15 - 0:19		
	75/25	0:30 - 1:20	1:01 - 1:12	0:34 - 1:01	0:19 - 0:34	0:27 - 0:30	0:15 - 0:19		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:34 - 1:24	0:49 - 1:01	0:27 - 0:49	0:15 - 0:27	0:23 - 0:42[10]	0:15 - 0:19[10]		
	75/25	0:30 - 1:20	1:01 - 1:12	0:34 - 1:01	0:19 - 0:34	0:27 - 0:30[10]	0:15 - 0:19[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:15 - 0:38	0:34 - 0:46	0:19 - 0:34	0:11 - 0:19				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:15 - 0:38	0:23 - 0:27	0:11 - 0:23	0:05 - 0:11				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than "light". No holdover times exist if the reported visibility correlates to a "moderate" or "heavy" precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-9.

TABLE ADJ-7: ADJUSTED TYPE II HOLDOVER TIMES FOR CLARIANT SAFEWING MP II FLIGHT

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:40 - 3:02	1:58 - 2:21	1:12 - 1:58	0:46 - 1:12	1:01 - 1:31	0:34 - 1:05	0:08 - 1:08	
	75/25	1:24 - 2:05	1:58 - 2:24	1:01 - 1:58	0:30 - 1:01	0:53 - 1:08	0:23 - 0:42	0:05 - 0:38	
	50/50	0:42 - 1:20	0:34 - 0:42	0:19 - 0:34	0:08 - 0:19	0:15 - 0:23	0:08 - 0:11	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:42 - 1:20	1:35 - 1:54	0:57 - 1:35	0:34 - 0:57	0:27 - 1:08	0:19 - 0:34		
	75/25	0:19 - 0:49	1:20 - 1:39	0:42 - 1:20	0:23 - 0:42	0:19 - 0:53	0:15 - 0:27		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:42 - 1:20	1:24 - 1:39	0:49 - 1:24	0:30 - 0:49	0:27 - 1:08[10]	0:19 - 0:34[10]		
	75/25	0:19 - 0:49	1:01 - 1:16	0:30 - 1:01	0:15 - 0:30	0:19 - 0:53[10]	0:15 - 0:27[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:23 - 0:38	0:53 - 1:16	0:19 - 0:53	0:06 - 0:19				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:23 - 0:38	0:23 - 0:30	0:08 - 0:23	0:02 - 0:08				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:23 - 0:38	0:15 - 0:23	0:05 - 0:15	0:02 - 0:05				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-9.

TABLE ADJ-8: ADJUSTED TYPE II HOLDOVER TIMES FOR CLARIANT SAFEWING MP II FLIGHT PLUS

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Snow, Snow Grains or Snow Pellets[4,5,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:02 - 3:02	0:38 - 1:24	1:05 - 1:31	0:34 - 0:46	0:11 - 1:31	
	75/25	1:58 - 3:02	0:46 - 1:20	1:12 - 1:31	0:38 - 0:57	0:11 - 0:57	
	50/50	0:49 - 1:46	0:11 - 0:19	0:23 - 0:49	0:11 - 0:15	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:30 - 1:46	0:30 - 1:08	0:27 - 1:05	0:27 - 0:42		
	75/25	0:23 - 1:20	0:46 - 1:16	0:19 - 0:53	0:23 - 0:34		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:30 - 1:46	0:27 - 0:57	0:27 - 1:05[10]	0:27 - 0:42[10]		
	75/25	0:23 - 1:20	0:42 - 1:16	0:19 - 0:53[10]	0:23 - 0:34[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:15 - 0:30	0:02 - 0:05				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:15 - 0:30	0:01 - 0:02				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:15 - 0:30	0:00 - 0:01				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-9.

TABLE ADJ-9: ADJUSTED TYPE II HOLDOVER TIMES FOR CRYOTECH POLAR GUARD® II

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:09 - 3:02	2:28 - 2:59	1:27 - 2:28	0:49 - 1:27	1:12 - 1:31	0:57 - 1:08	0:11 - 1:31	
	75/25	1:54 - 3:02	2:17 - 2:55	1:05 - 2:17	0:30 - 1:05	1:16 - 1:31	0:30 - 0:53	0:07 - 1:16	
	50/50	0:38 - 1:05	0:53 - 1:12	0:19 - 0:53	0:08 - 0:19	0:15 - 0:34	0:07 - 0:15	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:42 - 1:54	1:50 - 2:09	1:05 - 1:50	0:38 - 1:05	0:27 - 1:12	0:27 - 0:34		
	75/25	0:30 - 1:08	1:46 - 2:17	0:49 - 1:46	0:23 - 0:49	0:19 - 0:49	0:27 - 0:34		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:42 - 1:54	1:31 - 1:46	0:53 - 1:31	0:30 - 0:53	0:27 - 1:12[10]	0:27 - 0:34[10]		
	75/25	0:30 - 1:08	1:31 - 1:54	0:42 - 1:31	0:19 - 0:42	0:19 - 0:49[10]	0:27 - 0:34[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:19 - 0:38	1:12 - 1:43	0:27 - 1:12	0:08 - 0:27				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:19 - 0:38	0:30 - 0:42	0:11 - 0:30	0:03 - 0:11				
below -25 to -30.5 °C (below -13 to -23 °F)	100/0	0:19 - 0:38	0:19 - 0:23	0:05 - 0:19	0:02 - 0:05				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-9.

TABLE ADJ-10: ADJUSTED TYPE II HOLDOVER TIMES FOR JSC RCP NORDIX DEFROST PG 2

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	0:42 - 1:24	1:24 - 1:43	0:42 - 1:24	0:23 - 0:42	0:23 - 0:46	0:15 - 0:27	0:08 - 1:01	
	75/25	0:49 - 1:31	1:20 - 1:43	0:34 - 1:20	0:15 - 0:34	0:19 - 0:38	0:11 - 0:23	0:05 - 0:27	
	50/50	0:46 - 1:24	1:39 - 2:02	0:46 - 1:39	0:23 - 0:46	0:23 - 0:38	0:11 - 0:23	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:42 - 1:05	1:05 - 1:20	0:34 - 1:05	0:19 - 0:34	0:27 - 0:38	0:15 - 0:23		
	75/25	0:30 - 1:01	0:53 - 1:08	0:23 - 0:53	0:11 - 0:23	0:19 - 0:30	0:11 - 0:15		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:42 - 1:05	0:57 - 1:08	0:30 - 0:57	0:15 - 0:30	0:27 - 0:38[10]	0:15 - 0:23[10]		
	75/25	0:30 - 1:01	0:42 - 0:49	0:19 - 0:42	0:08 - 0:19	0:19 - 0:30[10]	0:11 - 0:15[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:27 - 0:49	0:15 - 0:23	0:05 - 0:15	0:02 - 0:05				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:27 - 0:49	0:07 - 0:11	0:02 - 0:07	0:01 - 0:02				
below -25 to -27 °C (below -13 to -17 °F)	100/0	0:27 - 0:49	0:04 - 0:05	0:01 - 0:04	0:00 - 0:01				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-9.

TABLE ADJ-11: ADJUSTED TYPE II HOLDOVER TIMES FOR KILFROST ABC-K PLUS

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Snow, Snow Grains or Snow Pellets[4,5,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:43 - 2:51	0:46 - 1:16	1:24 - 1:31	0:46 - 1:05	0:15 - 1:31	
	75/25	1:16 - 1:54	0:27 - 0:53	1:05 - 1:31	0:38 - 0:53	0:11 - 1:31	
	50/50	0:27 - 0:49	0:05 - 0:11	0:15 - 0:23	0:08 - 0:11	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:23 - 0:49	0:42 - 1:08	0:19 - 0:46	0:11 - 0:27		
	75/25	0:19 - 1:05	0:27 - 0:49	0:15 - 0:42	0:07 - 0:23		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:23 - 0:49	0:38 - 1:05	0:19 - 0:46[10]	0:11 - 0:27[10]		
	75/25	0:19 - 1:05	0:27 - 0:49	0:15 - 0:42[10]	0:07 - 0:23[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:23 - 0:42	0:02 - 0:05				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:23 - 0:42	0:01 - 0:02				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:23 - 0:42	0:00 - 0:01				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-9.

TABLE ADJ-12: ADJUSTED TYPE II HOLDOVER TIMES FOR KILFROST ICE CLEAR II

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:05 - 1:50	1:50 - 2:13	1:01 - 1:50	0:30 - 1:01	0:46 - 1:12	0:30 - 0:49	0:11 - 1:31	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:49 - 1:58	1:39 - 1:58	0:53 - 1:39	0:30 - 0:53	0:23 - 0:57	0:27 - 0:42		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:49 - 1:58	1:31 - 1:50	0:49 - 1:31	0:27 - 0:49	0:23 - 0:57[10]	0:27 - 0:42[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:27 - 0:34	0:42 - 0:49	0:23 - 0:42	0:11 - 0:23				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:27 - 0:34	0:23 - 0:27	0:11 - 0:23	0:06 - 0:11				
below -25 to -28 °C (below -13 to -18 °F)	100/0	0:27 - 0:34	0:19 - 0:23	0:08 - 0:19	0:05 - 0:08				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-9.

TABLE ADJ-13: ADJUSTED TYPE II HOLDOVER TIMES FOR MKS DEVO COREICEPHOB TYPE II

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:27 - 2:05	1:58 - 2:24	1:05 - 1:58	0:34 - 1:05	0:57 - 1:31	0:34 - 0:53	0:11 - 1:12	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	0:49 - 1:20	1:20 - 1:35	0:46 - 1:20	0:27 - 0:46	0:38 - 0:57	0:19 - 0:30	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:42 - 1:27	1:24 - 1:43	0:46 - 1:24	0:23 - 0:46	0:23 - 0:53	0:19 - 0:27		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:42 - 1:27	1:08 - 1:24	0:38 - 1:08	0:19 - 0:38	0:23 - 0:53[10]	0:19 - 0:27[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:15 - 0:23	0:27 - 0:30	0:15 - 0:27	0:08 - 0:15				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:15 - 0:23	0:11 - 0:11	0:05 - 0:11	0:03 - 0:05				
below -25 to -27 °C (below -13 to -17 °F)	100/0	0:15 - 0:23	0:08 - 0:08	0:04 - 0:08	0:02 - 0:04				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-9.

TABLE ADJ-14: ADJUSTED TYPE II HOLDOVER TIMES FOR NEWAVE AEROCHEMICAL FCY-2

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Snow, Snow Grains or Snow Pellets[4,5,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	0:57 - 1:50	0:23 - 0:42	0:27 - 0:49	0:19 - 0:27	0:06 - 0:34	
	75/25	0:38 - 1:08	0:15 - 0:30	0:19 - 0:34	0:11 - 0:19	0:04 - 0:19	
	50/50	0:19 - 0:27	0:11 - 0:19	0:08 - 0:15	0:05 - 0:08	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:34 - 1:08	0:15 - 0:30	0:15 - 0:34	0:11 - 0:15		
	75/25	0:23 - 0:49	0:11 - 0:19	0:11 - 0:23	0:06 - 0:11		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:34 - 1:08	0:11 - 0:23	0:15 - 0:34[10]	0:11 - 0:15[10]		
	75/25	0:23 - 0:49	0:08 - 0:15	0:11 - 0:23[10]	0:06 - 0:11[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:19 - 0:27	0:02 - 0:05				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:19 - 0:27	0:01 - 0:02				
below -25 to -28 °C (below -13 to -18 °F)	100/0	0:19 - 0:27	0:00 - 0:01				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-9.

TABLE ADJ-15: ADJUSTED TYPE II HOLDOVER TIMES FOR ROMCHIM ADD-PROTECT NG TYPE II

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	0:53 - 1:50	1:58 - 2:28	0:53 - 1:58	0:27 - 0:53	0:38 - 1:01	0:27 - 0:38	0:05 - 0:53	
	75/25	0:46 - 1:24	1:27 - 1:50	0:42 - 1:27	0:19 - 0:42	0:30 - 0:57	0:19 - 0:30	0:05 - 0:42	
	50/50	0:19 - 0:42	0:42 - 0:49	0:23 - 0:42	0:11 - 0:23	0:15 - 0:27	0:08 - 0:15	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:42 - 1:12	1:24 - 1:46	0:38 - 1:24	0:19 - 0:38	0:27 - 0:53	0:19 - 0:27		
	75/25	0:42 - 1:05	1:05 - 1:20	0:30 - 1:05	0:15 - 0:30	0:19 - 0:49	0:15 - 0:23		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:42 - 1:12	1:05 - 1:24	0:30 - 1:05	0:15 - 0:30	0:27 - 0:53[10]	0:19 - 0:27[10]		
	75/25	0:42 - 1:05	0:49 - 1:05	0:23 - 0:49	0:11 - 0:23	0:19 - 0:49[10]	0:15 - 0:23[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:11 - 0:15	0:15 - 0:23	0:05 - 0:15	0:02 - 0:05				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:11 - 0:15	0:07 - 0:11	0:02 - 0:07	0:01 - 0:02				
below -25 to -28 °C (below -13 to -18 °F)	100/0	0:11 - 0:15	0:04 - 0:05	0:01 - 0:04	0:00 - 0:01				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-9.

TABLE ADJ-16: ADJUSTED TYPE II HOLDOVER TIMES FOR ROMCHIM ADD-PROTECT TYPE II

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:16 - 2:40	1:27 - 1:50	0:46 - 1:27	0:23 - 0:46	0:30 - 1:12	0:19 - 0:34	0:07 - 0:38	
	75/25	0:30 - 0:53	0:46 - 0:53	0:23 - 0:46	0:11 - 0:23	0:19 - 0:30	0:11 - 0:19	0:04 - 0:19	
	50/50	0:15 - 0:27	0:23 - 0:27	0:11 - 0:23	0:07 - 0:11	0:08 - 0:23	0:06 - 0:08	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:23 - 0:34	1:01 - 1:16	0:30 - 1:01	0:15 - 0:30	0:19 - 0:38	0:15 - 0:23		
	75/25	0:23 - 0:42	0:30 - 0:38	0:19 - 0:30	0:08 - 0:19	0:15 - 0:23	0:11 - 0:15		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:23 - 0:34	0:49 - 1:01	0:27 - 0:49	0:11 - 0:27	0:19 - 0:38[10]	0:15 - 0:23[10]		
	75/25	0:23 - 0:42	0:27 - 0:30	0:15 - 0:27	0:07 - 0:15	0:15 - 0:23[10]	0:11 - 0:15[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:11 - 0:19	0:15 - 0:23	0:05 - 0:15	0:02 - 0:05				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:11 - 0:19	0:07 - 0:11	0:02 - 0:07	0:01 - 0:02				
below -25 to -28 °C (below -13 to -18 °F)	100/0	0:11 - 0:19	0:04 - 0:05	0:01 - 0:04	0:00 - 0:01				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-9.

ADJUSTED HOT GUIDELINES FOR SAE TYPE III FLUIDS WINTER 2023-2024

The HOT Guidelines are provided for information and guidance purposes. The HOT Guidelines on their own do not change, create, amend or permit deviations from regulatory requirements.

The HOT Guidelines may use mandatory terms such as “must”, “shall” and “is/are required” so as to convey the intent of meeting regulatory requirements and SAE Standards, where applicable. The term “should” is to be understood, unless an alternative method of achieving safety is implemented that would meet or exceed the intent of the recommendation.

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The time of protection will be shortened in heavy weather conditions. Heavy precipitation rates or high moisture content, high wind velocity, or jet blast may reduce holdover time below the lowest time stated in the range. Holdover time may be reduced when aircraft skin temperature is lower than outside air temperature.
- Fluids used during ground de/anti-icing do not provide in-flight icing protection.
- This table is for departure planning only and should be used in conjunction with pretakeoff check procedures

TABLE ADJ-17: ADJUSTED TYPE III HOLDOVER TIMES FOR ALLCLEAR AEROCLEAR MAX APPLIED UNHEATED ON LOW SPEED AIRCRAFT[1]

Outside Air Temperature[2]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[3], or Ice Crystals[4]	Very Light Snow, Snow Grains or Snow Pellets[5,6,7]	Light Snow, Snow Grains or Snow Pellets[5,6,7]	Moderate Snow, Snow Grains or Snow Pellets[5,7]	Freezing Drizzle[8]	Light Freezing Rain	Rain on Cold-Soaked Wing[9]	Other[10]
-3 °C and above (27 °F and above)	100/0	0:34 - 1:27	1:01 - 1:20	0:30 - 1:01	0:14 - 0:30	0:19 - 0:38	0:11 - 0:19	0:04 - 0:30	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -10 °C (below 27 to 14 °F)	100/0	0:38 - 1:16	1:01 - 1:20	0:30 - 1:01	0:14 - 0:30	0:19 - 0:34	0:11 - 0:19		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -10 to -16 °C (below 14 to 3 °F)	100/0	0:30 - 1:20	1:01 - 1:20	0:30 - 1:01	0:14 - 0:30				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 These holdover times are for aircraft conforming to the SAE AS5900 low speed aerodynamic test criterion. Fluid must be applied unheated to use these holdover times. No holdover times exist for this fluid applied heated. If uncertain whether the aircraft conforms to the low, middle, or high speed aerodynamic test criterion, no holdover time guidelines exist below -16°C (3°F).
2 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type III fluid cannot be used.
3 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
4 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
5 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
6 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
7 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
8 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
9 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
10 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-23.

TABLE ADJ-18: ADJUSTED TYPE III HOLDOVER TIMES FOR ALLCLEAR AEROCLEAR MAX APPLIED UNHEATED ON MIDDLE SPEED AIRCRAFT[1]

Outside Air Temperature[2]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[3], or Ice Crystals[4]	Very Light Snow, Snow Grains or Snow Pellets[5,6,7]	Light Snow, Snow Grains or Snow Pellets[5,6,7]	Moderate Snow, Snow Grains or Snow Pellets[5,7]	Freezing Drizzle[8]	Light Freezing Rain	Rain on Cold-Soaked Wing[9]	Other[10]
-3 °C and above (27 °F and above)	100/0	0:34 - 1:27	1:01 - 1:20	0:30 - 1:01	0:14 - 0:30	0:19 - 0:38	0:11 - 0:19	0:04 - 0:30	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -10 °C (below 27 to 14 °F)	100/0	0:38 - 1:16	1:01 - 1:20	0:30 - 1:01	0:14 - 0:30	0:19 - 0:34	0:11 - 0:19		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -10 to -20.5 °C (below 14 to -5 °F)	100/0	0:30 - 1:20	1:01 - 1:20	0:30 - 1:01	0:14 - 0:30				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 These holdover times are for aircraft conforming to the SAE AS5900 middle speed aerodynamic test criterion. Fluid must be applied unheated to use these holdover times. No holdover times exist for this fluid applied heated. If uncertain whether the aircraft conforms to the low, middle, or high speed aerodynamic test criterion, no holdover time guidelines exist below -16°C (3°F).
2 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type III fluid cannot be used.
3 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
4 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
5 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
6 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
7 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
8 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
9 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
10 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-23.

TABLE ADJ-19: ADJUSTED TYPE III HOLDOVER TIMES FOR ALLCLEAR AEROCLEAR MAX APPLIED UNHEATED ON HIGH SPEED AIRCRAFT[1]

Outside Air Temperature[2]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[3], or Ice Crystals[4]	Very Light Snow, Snow Grains or Snow Pellets[5,6,7]	Light Snow, Snow Grains or Snow Pellets[5,6,7]	Moderate Snow, Snow Grains or Snow Pellets[5,7]	Freezing Drizzle[8]	Light Freezing Rain	Rain on Cold-Soaked Wing[9]	Other[10]
-3 °C and above (27 °F and above)	100/0	0:34 - 1:27	1:01 - 1:20	0:30 - 1:01	0:14 - 0:30	0:19 - 0:38	0:11 - 0:19	0:04 - 0:30	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -10 °C (below 27 to 14 °F)	100/0	0:38 - 1:16	1:01 - 1:20	0:30 - 1:01	0:14 - 0:30	0:19 - 0:34	0:11 - 0:19		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -10 to -25 °C (below 14 to -13 °F)	100/0	0:30 - 1:20	1:01 - 1:20	0:30 - 1:01	0:14 - 0:30				
below -25 to -35 °C (below -13 to -31 °F)	100/0	0:19 - 0:46	0:34 - 0:46	0:15 - 0:34	0:08 - 0:15				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 These holdover times are for aircraft conforming to the SAE AS5900 high speed aerodynamic test criterion. Fluid must be applied unheated to use these holdover times. No holdover times exist for this fluid applied heated. If uncertain whether the aircraft conforms to the low, middle, or high speed aerodynamic test criterion, no holdover time guidelines exist below -16°C (3°F).
2 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type III fluid cannot be used.
3 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
4 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
5 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
6 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
7 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
8 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
9 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
10 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-47 provides allowance times for ice pellets and small hail for SAE Type III fluids, applied unheated).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-23.

ADJUSTED HOT GUIDELINES FOR SAE TYPE IV FLUIDS
WINTER 2023-2024

The HOT Guidelines are provided for information and guidance purposes. The HOT Guidelines on their own do not change, create, amend or permit deviations from regulatory requirements.

The HOT Guidelines may use mandatory terms such as “must”, “shall” and “is/are required” so as to convey the intent of meeting regulatory requirements and SAE Standards, where applicable. The term “should” is to be understood, unless an alternative method of achieving safety is implemented that would meet or exceed the intent of the recommendation.

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The time of protection will be shortened in heavy weather conditions. Heavy precipitation rates or high moisture content, high wind velocity, or jet blast may reduce holdover time below the lowest time stated in the range. Holdover time may be reduced when aircraft skin temperature is lower than outside air temperature.
- Fluids used during ground de/anti-icing do not provide in-flight icing protection.
- This table is for departure planning only and should be used in conjunction with pretakeoff check procedures
- These holdover times are for aircraft conforming to the SAE AS5900 high speed aerodynamic test criterion. If uncertain whether the aircraft conforms to the low, middle, or high speed aerodynamic test criterion, no holdover time guidelines exist.

TABLE ADJ-20: ADJUSTED GENERIC HOLDOVER TIMES FOR SAE TYPE IV FLUIDS[1]

Outside Air Temperature[2]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[3], or Ice Crystals[4]	Very Light Snow, Snow Grains or Snow Pellets[5,6,7]	Light Snow, Snow Grains or Snow Pellets[5,6,7]	Moderate Snow, Snow Grains or Snow Pellets[5,7]	Freezing Drizzle[8]	Light Freezing Rain	Rain on Cold-Soaked Wing[9]	Other[10]
-3 °C and above (27 °F and above)	100/0	0:57 - 2:02	1:27 - 1:46	0:46 - 1:27	0:23 - 0:46	0:30 - 0:53	0:15 - 0:27	0:06 - 0:49	
	75/25	1:05 - 2:02	1:35 - 1:50	0:57 - 1:35	0:30 - 0:57	0:46 - 1:01	0:23 - 0:38	0:07 - 1:01	
	50/50	0:23 - 0:42	0:46 - 0:53	0:19 - 0:46	0:08 - 0:19	0:11 - 0:30	0:07 - 0:15	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:15 - 1:12	1:20 - 1:35	0:42 - 1:20	0:19 - 0:42	0:19 - 0:53	0:15 - 0:19		
	75/25	0:23 - 1:01	1:24 - 1:39	0:49 - 1:24	0:23 - 0:49	0:15 - 0:49	0:11 - 0:19		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:15 - 1:12	1:08 - 1:24	0:38 - 1:08	0:19 - 0:38	0:19 - 0:53[11]	0:15 - 0:19[11]		
	75/25	0:23 - 1:01	1:16 - 1:31	0:42 - 1:16	0:19 - 0:42	0:15 - 0:49[11]	0:11 - 0:19[11]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:15 - 0:27	0:23 - 0:34	0:07 - 0:23	0:02 - 0:07				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:15 - 0:27	0:08 - 0:15	0:02 - 0:08	0:01 - 0:02				
below -25° C to LOUT[12] (below -13° F to LOUT)	100/0	0:15 - 0:27	0:05 - 0:08	0:02 - 0:05	0:00 - 0:02				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 To use the HOTs in this table, ensure that the fluid and dilution being used is listed in the Type IV Fluids Tested for Anti-Icing Performance and Aerodynamic Acceptance table (Table 54). Any restrictions on the use of the fluid have to be identified and applied.
2 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
3 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
4 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
5 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
6 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
7 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
8 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
9 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
10 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides allowance times for Type IV EG fluids and Table Adj-49 provides allowance times for Type IV PG fluids in ice pellets and small hail. If the glycol type is unknown, the allowance times for SAE Type IV PG fluids should be used).
11 No holdover time guidelines exist for this condition below -10 °C (14 °F).
12 If the LOUT is unknown, no holdover time guidelines exist below -25.5 °C (-14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-21: ADJUSTED TYPE IV HOLDOVER TIMES FOR ABAX ECOWING AD-49

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:32 - 3:02	2:47 - 3:00	1:27 - 2:47	0:46 - 1:27	1:05 - 1:31	0:46 - 1:05	0:08 - 1:27	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:15 - 1:12	2:13 - 2:40	1:08 - 2:13	0:34 - 1:08	0:19 - 1:05	0:15 - 0:19		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:15 - 1:12	1:50 - 2:17	0:57 - 1:50	0:30 - 0:57	0:19 - 1:05[10]	0:15 - 0:19[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:19 - 0:30	0:23 - 0:34	0:07 - 0:23	0:02 - 0:07				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:19 - 0:30	0:08 - 0:15	0:02 - 0:08	0:01 - 0:02				
below -25 to -26 °C (below -13 to -15 °F)	100/0	0:19 - 0:30	0:05 - 0:08	0:02 - 0:05	0:00 - 0:02				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-22: ADJUSTED TYPE IV HOLDOVER TIMES FOR ALAB INTERNATIONAL PROFLIGHT EG4

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:39 - 3:02	1:54 - 2:17	1:01 - 1:54	0:30 - 1:01	0:49 - 1:27	0:27 - 0:42	0:11 - 1:31	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:35 - 2:59	2:24 - 2:59	1:16 - 2:24	0:42 - 1:16	0:46 - 1:31	0:38 - 0:49		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:35 - 2:59	2:43 - 3:00	1:27 - 2:43	0:46 - 1:27	0:46 - 1:31[10]	0:38 - 0:49[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:23 - 1:08	0:38 - 0:49	0:19 - 0:38	0:08 - 0:19				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:23 - 1:08	0:30 - 0:42	0:11 - 0:30	0:04 - 0:11				
below -25 to -26 °C (below -13 to -15 °F)	100/0	0:23 - 1:08	0:19 - 0:27	0:06 - 0:19	0:02 - 0:06				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-23: ADJUSTED TYPE IV HOLDOVER TIMES FOR ALLCLEAR CLEARWING ECO

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:31 - 3:02	2:43 - 3:00	1:20 - 2:43	0:38 - 1:20	1:24 - 1:31	1:01 - 1:16	0:15 - 1:31	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:46 - 1:54	2:02 - 2:32	1:01 - 2:02	0:30 - 1:01	0:42 - 1:31	0:34 - 0:57		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:46 - 1:54	1:39 - 2:02	0:49 - 1:39	0:23 - 0:49	0:42 - 1:31[10]	0:34 - 0:57[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:19 - 0:34	0:49 - 1:01	0:27 - 0:49	0:11 - 0:27				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:19 - 0:34	0:23 - 0:27	0:11 - 0:23	0:05 - 0:11				
below -25 to -26 °C (below -13 to -15 °F)	100/0	0:19 - 0:34	0:19 - 0:27	0:11 - 0:19	0:05 - 0:11				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-24: ADJUSTED TYPE IV HOLDOVER TIMES FOR ALLCLEAR CLEARWING EG

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:24 - 2:28	2:02 - 2:32	1:01 - 2:02	0:30 - 1:01	0:53 - 1:12	0:23 - 0:46	0:08 - 1:08	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:12 - 2:51	1:50 - 2:17	0:53 - 1:50	0:27 - 0:53	0:49 - 1:08	0:23 - 0:46		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:12 - 2:51	1:43 - 2:05	0:49 - 1:43	0:23 - 0:49	0:49 - 1:08[10]	0:23 - 0:46[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:42 - 1:31	1:12 - 1:35	0:34 - 1:12	0:15 - 0:34				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:42 - 1:31	0:42 - 0:53	0:19 - 0:42	0:11 - 0:19				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:42 - 1:31	0:34 - 0:42	0:15 - 0:34	0:08 - 0:15				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-25: ADJUSTED TYPE IV HOLDOVER TIMES FOR ASGLOBAL 4FLITE EG

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:12 - 2:28	1:35 - 1:58	0:46 - 1:35	0:23 - 0:46	0:30 - 0:53	0:15 - 0:27	0:06 - 0:49	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:05 - 2:05	1:24 - 1:43	0:42 - 1:24	0:19 - 0:42	0:30 - 0:53	0:15 - 0:27		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:05 - 2:05	1:12 - 1:31	0:38 - 1:12	0:19 - 0:38	0:30 - 0:53[10]	0:15 - 0:27[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:38 - 1:05	1:12 - 1:31	0:34 - 1:12	0:15 - 0:34				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:38 - 1:05	1:01 - 1:16	0:27 - 1:01	0:15 - 0:27				
below -25 to -30 °C (below -13 to -22 °F)	100/0	0:23 - 0:49	0:42 - 0:49	0:19 - 0:42	0:08 - 0:19				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-26: ADJUSTED TYPE IV HOLDOVER TIMES FOR ASGLOBAL 4FLITE PG

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:24 - 2:28	2:09 - 2:36	1:12 - 2:09	0:38 - 1:12	0:53 - 1:12	0:34 - 0:49	0:11 - 1:01	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:49 - 1:27	1:35 - 1:54	0:53 - 1:35	0:27 - 0:53	0:42 - 0:53	0:27 - 0:42		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:49 - 1:27	1:16 - 1:31	0:42 - 1:16	0:23 - 0:42	0:42 - 0:53[10]	0:27 - 0:42[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:23 - 0:34	0:49 - 1:01	0:27 - 0:49	0:11 - 0:27				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:23 - 0:34	0:27 - 0:34	0:15 - 0:27	0:07 - 0:15				
below -25 to -26 °C (below -13 to -15 °F)	100/0	0:23 - 0:34	0:27 - 0:34	0:15 - 0:27	0:06 - 0:15				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-27: ADJUSTED TYPE IV HOLDOVER TIMES FOR AVIAFLUID AVIAFLIGHT EG

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:08 - 2:21	1:27 - 1:46	0:53 - 1:27	0:30 - 0:53	0:49 - 1:31	0:23 - 0:38	0:08 - 1:31	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:01 - 2:17	1:20 - 1:35	0:46 - 1:20	0:27 - 0:46	0:42 - 1:08	0:27 - 0:38		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:01 - 2:17	1:12 - 1:27	0:42 - 1:12	0:23 - 0:42	0:42 - 1:08[10]	0:27 - 0:38[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:27 - 1:20	1:16 - 1:31	0:38 - 1:16	0:19 - 0:38				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:27 - 1:20	1:01 - 1:12	0:30 - 1:01	0:15 - 0:30				
below -25 to -31 °C (below -13 to -24 °F)	100/0	0:27 - 0:49	0:27 - 0:34	0:15 - 0:27	0:07 - 0:15				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-28: ADJUSTED TYPE IV HOLDOVER TIMES FOR AVIAFLUID AVIAFLIGHT PG

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:43 - 3:02	2:17 - 2:47	1:16 - 2:17	0:42 - 1:16	1:31 - 1:31	0:53 - 1:27	0:15 - 1:31	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:49 - 1:39	1:31 - 1:50	0:49 - 1:31	0:27 - 0:49	0:27 - 1:27	0:34 - 0:49		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:49 - 1:39	1:08 - 1:24	0:38 - 1:08	0:19 - 0:38	0:27 - 1:27[10]	0:34 - 0:49[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:15 - 0:27	0:38 - 0:46	0:19 - 0:38	0:11 - 0:19				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:15 - 0:27	0:19 - 0:23	0:11 - 0:19	0:05 - 0:11				
below -25 to -25.5 °C (below -13 to -14 °F)	100/0	0:15 - 0:27	0:19 - 0:23	0:08 - 0:19	0:05 - 0:08				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-29: ADJUSTED TYPE IV HOLDOVER TIMES FOR CHEMCO CHEMR EG IV

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:35 - 2:43	2:17 - 2:55	0:57 - 2:17	0:27 - 0:57	0:34 - 1:16	0:19 - 0:30	0:07 - 1:20	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:05 - 2:47	2:17 - 2:55	0:57 - 2:17	0:27 - 0:57	0:46 - 1:12	0:27 - 0:38		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:05 - 2:47	2:17 - 2:55	0:57 - 2:17	0:27 - 0:57	0:46 - 1:12[10]	0:27 - 0:38[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:30 - 1:05	1:05 - 1:20	0:30 - 1:05	0:15 - 0:30				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:30 - 1:05	1:05 - 1:20	0:30 - 1:05	0:15 - 0:30				
below -25 to -27 °C (below -13 to -17 °F)	100/0	0:30 - 1:05	1:05 - 1:20	0:30 - 1:05	0:15 - 0:30				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-30: ADJUSTED TYPE IV HOLDOVER TIMES FOR CHEMCO CHEMR NORDIK IV

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:43 - 3:02	2:28 - 3:00	1:20 - 2:28	0:42 - 1:20	1:01 - 1:31	0:42 - 1:01	0:19 - 1:31	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:24 - 3:02	2:28 - 3:00	1:20 - 2:28	0:42 - 1:20	0:57 - 1:31	0:34 - 1:01		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:24 - 3:02	2:28 - 3:00	1:20 - 2:28	0:42 - 1:20	0:57 - 1:31[10]	0:34 - 1:01[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:30 - 1:08	2:21 - 2:51	1:12 - 2:21	0:38 - 1:12				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:30 - 1:08	1:39 - 2:02	0:49 - 1:39	0:27 - 0:49				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:30 - 1:08	1:24 - 1:43	0:42 - 1:24	0:23 - 0:42				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-31: ADJUSTED TYPE IV HOLDOVER TIMES FOR CLARIANT MAX FLIGHT AVIA

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:21 - 3:02	2:17 - 2:43	1:20 - 2:17	0:46 - 1:20	1:05 - 1:31	0:42 - 0:53	0:07 - 1:31	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:20 - 2:59	1:54 - 2:17	1:05 - 1:54	0:38 - 1:05	0:53 - 1:31	0:42 - 1:08		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:20 - 2:59	1:39 - 1:58	0:57 - 1:39	0:30 - 0:57	0:53 - 1:31[10]	0:42 - 1:08[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:27 - 1:05	0:38 - 0:49	0:19 - 0:38	0:08 - 0:19				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:27 - 1:05	0:30 - 0:42	0:11 - 0:30	0:04 - 0:11				
below -25 to -28.5 °C (below -13 to -19 °F)	100/0	0:27 - 1:05	0:19 - 0:27	0:06 - 0:19	0:02 - 0:06				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides allowance times for Type IV EG fluids in ice pellets and small hail)..
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-32: ADJUSTED TYPE IV HOLDOVER TIMES FOR CLARIANT MAX FLIGHT SNEG

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:50 - 3:02	2:17 - 2:47	1:16 - 2:17	0:42 - 1:16	1:31 - 1:31	0:38 - 1:16	0:15 - 1:08	
	75/25	3:02 - 3:02	1:50 - 2:09	1:08 - 1:50	0:42 - 1:08	1:08 - 1:31	0:49 - 1:01	0:11 - 1:20	
	50/50	1:08 - 2:40	1:20 - 1:46	0:34 - 1:20	0:15 - 0:34	0:27 - 0:53	0:11 - 0:23	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:34 - 1:46	1:50 - 2:13	1:01 - 1:50	0:34 - 1:01	0:23 - 1:05	0:19 - 0:30		
	75/25	0:23 - 1:05	1:27 - 1:43	0:53 - 1:27	0:34 - 0:53	0:15 - 0:49	0:15 - 0:30		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:34 - 1:46	1:35 - 1:54	0:53 - 1:35	0:30 - 0:53	0:23 - 1:05[10]	0:19 - 0:30[10]		
	75/25	0:23 - 1:05	1:16 - 1:31	0:46 - 1:16	0:30 - 0:46	0:15 - 0:49[10]	0:15 - 0:30[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:15 - 0:38	0:23 - 0:34	0:07 - 0:23	0:02 - 0:07				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:15 - 0:38	0:08 - 0:15	0:02 - 0:08	0:01 - 0:02				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:15 - 0:38	0:05 - 0:08	0:02 - 0:05	0:00 - 0:02				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-33: ADJUSTED TYPE IV HOLDOVER TIMES FOR CLARIANT SAFEWING EG IV NORTH

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:46 - 2:59	2:17 - 2:47	1:16 - 2:17	0:38 - 1:16	1:08 - 1:31	0:38 - 0:42	0:06 - 1:31	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:20 - 3:02	2:09 - 2:40	1:08 - 2:09	0:38 - 1:08	0:49 - 1:24	0:42 - 1:05		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:20 - 3:02	2:05 - 2:32	1:08 - 2:05	0:38 - 1:08	0:49 - 1:24[10]	0:42 - 1:05[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:30 - 1:01	0:38 - 0:49	0:19 - 0:38	0:08 - 0:19				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:30 - 1:01	0:30 - 0:42	0:11 - 0:30	0:04 - 0:11				
below -25 to -30 °C (below -13 to -22 °F)	100/0	0:30 - 1:01	0:19 - 0:27	0:06 - 0:19	0:02 - 0:06				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-34: ADJUSTED TYPE IV HOLDOVER TIMES FOR CLARIANT SAFEWING MP IV LAUNCH

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	3:02 - 3:02	2:09 - 2:32	1:20 - 2:09	0:49 - 1:20	1:08 - 1:31	0:46 - 1:16	0:11 - 1:16	
	75/25	2:47 - 3:02	2:21 - 2:47	1:20 - 2:21	0:46 - 1:20	1:16 - 1:31	0:34 - 0:57	0:08 - 1:20	
	50/50	1:05 - 2:05	1:05 - 1:16	0:34 - 1:05	0:19 - 0:34	0:23 - 0:38	0:15 - 0:19	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:46 - 1:27	1:50 - 2:09	1:08 - 1:50	0:42 - 1:08	0:27 - 1:16	0:19 - 0:34		
	75/25	0:30 - 1:01	2:02 - 2:28	1:08 - 2:02	0:38 - 1:08	0:19 - 0:53	0:19 - 0:34		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:46 - 1:27	1:39 - 1:54	1:01 - 1:39	0:38 - 1:01	0:27 - 1:16[10]	0:19 - 0:34[10]		
	75/25	0:30 - 1:01	1:50 - 2:13	1:05 - 1:50	0:34 - 1:05	0:19 - 0:53[10]	0:19 - 0:34[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:23 - 0:38	0:57 - 1:20	0:15 - 0:57	0:05 - 0:15				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:23 - 0:38	0:23 - 0:34	0:07 - 0:23	0:02 - 0:07				
below -25 to -28.5 °C (below -13 to -19 °F)	100/0	0:23 - 0:38	0:15 - 0:23	0:05 - 0:15	0:01 - 0:05				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-35: ADJUSTED TYPE IV HOLDOVER TIMES FOR CLARIANT SAFEWING MP IV LAUNCH PLUS

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:59 - 3:02	3:00 - 3:00	1:35 - 3:00	0:42 - 1:35	1:31 - 1:31	0:46 - 1:31	0:15 - 1:31	
	75/25	2:59 - 3:02	3:00 - 3:00	1:27 - 3:00	0:38 - 1:27	1:31 - 1:31	1:01 - 1:05	0:15 - 1:24	
	50/50	0:57 - 1:24	1:12 - 1:31	0:34 - 1:12	0:15 - 0:34	0:19 - 0:46	0:11 - 0:15	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:42 - 1:43	2:51 - 3:00	1:16 - 2:51	0:34 - 1:16	0:19 - 1:12	0:19 - 0:30		
	75/25	0:30 - 1:31	2:40 - 3:00	1:08 - 2:40	0:27 - 1:08	0:15 - 0:49	0:15 - 0:23		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:42 - 1:43	2:28 - 3:00	1:05 - 2:28	0:30 - 1:05	0:19 - 1:12[10]	0:19 - 0:30[10]		
	75/25	0:30 - 1:31	2:13 - 2:55	0:57 - 2:13	0:23 - 0:57	0:15 - 0:49[10]	0:15 - 0:23[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:19 - 0:38	0:57 - 1:24	0:19 - 0:57	0:05 - 0:19				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:19 - 0:38	0:23 - 0:34	0:07 - 0:23	0:02 - 0:07				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:19 - 0:38	0:15 - 0:23	0:05 - 0:15	0:02 - 0:05				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-36: ADJUSTED TYPE IV HOLDOVER TIMES FOR CRYOTECH POLAR GUARD® ADVANCE

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:09 - 3:02	2:28 - 2:59	1:27 - 2:28	0:49 - 1:27	1:12 - 1:31	0:57 - 1:08	0:11 - 1:31	
	75/25	1:54 - 3:02	2:17 - 2:55	1:05 - 2:17	0:30 - 1:05	1:16 - 1:31	0:30 - 0:53	0:07 - 1:16	
	50/50	0:38 - 1:05	0:53 - 1:12	0:19 - 0:53	0:08 - 0:19	0:15 - 0:34	0:07 - 0:15	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:42 - 1:54	1:50 - 2:09	1:05 - 1:50	0:38 - 1:05	0:27 - 1:12	0:27 - 0:34		
	75/25	0:30 - 1:08	1:46 - 2:17	0:49 - 1:46	0:23 - 0:49	0:19 - 0:49	0:27 - 0:34		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:42 - 1:54	1:31 - 1:46	0:53 - 1:31	0:30 - 0:53	0:27 - 1:12[10]	0:27 - 0:34[10]		
	75/25	0:30 - 1:08	1:31 - 1:54	0:42 - 1:31	0:19 - 0:42	0:19 - 0:49[10]	0:27 - 0:34[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:19 - 0:38	1:12 - 1:43	0:27 - 1:12	0:08 - 0:27				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:19 - 0:38	0:30 - 0:42	0:11 - 0:30	0:03 - 0:11				
below -25 to -30.5 °C (below -13 to -23 °F)	100/0	0:19 - 0:38	0:19 - 0:23	0:05 - 0:19	0:02 - 0:05				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-37: ADJUSTED TYPE IV HOLDOVER TIMES FOR CRYOTECH POLAR GUARD® XTEND

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:54 - 3:02	2:43 - 3:00	1:31 - 2:43	0:49 - 1:31	1:31 - 1:31	0:46 - 1:24	0:15 - 1:20	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:46 - 1:24	2:09 - 2:36	1:12 - 2:09	0:38 - 1:12	0:27 - 1:16	0:38 - 0:42		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:46 - 1:24	1:50 - 2:13	1:01 - 1:50	0:34 - 1:01	0:27 - 1:16[10]	0:38 - 0:42[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:19 - 0:30	1:01 - 1:16	0:30 - 1:01	0:15 - 0:30				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:19 - 0:30	0:23 - 0:30	0:11 - 0:23	0:05 - 0:11				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:19 - 0:30	0:15 - 0:19	0:07 - 0:15	0:03 - 0:07				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-38: ADJUSTED TYPE IV HOLDOVER TIMES FOR DOW CHEMICAL UCAR ENDURANCE™ EG106

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:35 - 2:24	2:05 - 2:40	1:01 - 2:05	0:30 - 1:01	0:53 - 1:31	0:38 - 0:57	0:15 - 1:31	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:24 - 2:32	1:50 - 2:17	0:53 - 1:50	0:27 - 0:53	0:42 - 1:24	0:34 - 0:53		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:24 - 2:32	1:39 - 2:05	0:49 - 1:39	0:23 - 0:49	0:42 - 1:24[10]	0:34 - 0:53[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:23 - 0:49	1:20 - 1:43	0:38 - 1:20	0:19 - 0:38				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:23 - 0:49	1:08 - 1:27	0:30 - 1:08	0:15 - 0:30				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:23 - 0:49	1:01 - 1:20	0:30 - 1:01	0:15 - 0:30				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-39: ADJUSTED TYPE IV HOLDOVER TIMES FOR DOW CHEMICAL UCAR™ FLIGHTGUARD™ AD-49

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	2:32 - 3:02	2:47 - 3:00	1:27 - 2:47	0:46 - 1:27	1:05 - 1:31	0:46 - 1:05	0:08 - 1:27	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:15 - 1:12	2:13 - 2:40	1:08 - 2:13	0:34 - 1:08	0:19 - 1:05	0:15 - 0:19		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:15 - 1:12	1:50 - 2:17	0:57 - 1:50	0:30 - 0:57	0:19 - 1:05[10]	0:15 - 0:19[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:19 - 0:30	0:23 - 0:34	0:07 - 0:23	0:02 - 0:07				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:19 - 0:30	0:08 - 0:15	0:02 - 0:08	0:01 - 0:02				
below -25 to -26 °C (below -13 to -15 °F)	100/0	0:19 - 0:30	0:05 - 0:08	0:02 - 0:05	0:00 - 0:02				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-40: ADJUSTED TYPE IV HOLDOVER TIMES FOR INLAND TECHNOLOGIES ECO-SHIELD®

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	0:57 - 2:02	1:50 - 2:09	1:01 - 1:50	0:34 - 1:01	0:30 - 1:08	0:27 - 0:30	0:11 - 1:12	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:53 - 1:58	1:35 - 1:54	0:53 - 1:35	0:30 - 0:53	0:38 - 1:05	0:23 - 0:30		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:53 - 1:58	1:27 - 1:43	0:49 - 1:27	0:27 - 0:49	0:38 - 1:05[10]	0:23 - 0:30[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:23 - 0:46	0:23 - 0:34	0:07 - 0:23	0:02 - 0:07				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:23 - 0:46	0:08 - 0:15	0:02 - 0:08	0:01 - 0:02				
below -25 to -25.5 °C (below -13 to -14 °F)	100/0	0:23 - 0:46	0:05 - 0:08	0:02 - 0:05	0:00 - 0:02				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-41: ADJUSTED TYPE IV HOLDOVER TIMES FOR JSC RCP NORDIX DEFROST ECO 4

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:08 - 2:02	1:54 - 2:24	0:57 - 1:54	0:27 - 0:57	0:49 - 1:08	0:30 - 0:49	0:11 - 0:53	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:42 - 1:58	1:43 - 2:05	0:49 - 1:43	0:27 - 0:49	0:38 - 1:01	0:27 - 0:38		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:42 - 1:58	1:35 - 1:58	0:46 - 1:35	0:23 - 0:46	0:38 - 1:01[10]	0:27 - 0:38[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:23 - 0:38	0:23 - 0:34	0:07 - 0:23	0:02 - 0:07				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:23 - 0:38	0:08 - 0:15	0:02 - 0:08	0:01 - 0:02				
below -25 to -25.5 °C (below -13 to -14 °F)	100/0	0:23 - 0:38	0:05 - 0:08	0:02 - 0:05	0:00 - 0:02				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-42: ADJUSTED TYPE IV HOLDOVER TIMES FOR JSC RCP NORDIX DEFROST NORTH 4

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:39 - 3:02	2:13 - 2:51	1:05 - 2:13	0:30 - 1:05	0:49 - 1:31	0:23 - 0:38	0:07 - 1:27	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	2:02 - 3:02	2:13 - 2:51	1:05 - 2:13	0:30 - 1:05	0:49 - 1:31	0:30 - 0:46		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	2:02 - 3:02	2:13 - 2:51	1:05 - 2:13	0:30 - 1:05	0:49 - 1:31[10]	0:30 - 0:46[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:34 - 1:27	0:38 - 0:49	0:19 - 0:38	0:08 - 0:19				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:34 - 1:27	0:30 - 0:42	0:11 - 0:30	0:04 - 0:11				
below -25 to -26 °C (below -13 to -15 °F)	100/0	0:34 - 1:27	0:19 - 0:27	0:06 - 0:19	0:02 - 0:06				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-43: ADJUSTED TYPE IV HOLDOVER TIMES FOR KILFROST ABC-S PLUS

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:39 - 3:02	2:43 - 3:00	1:35 - 2:43	0:57 - 1:35	1:24 - 1:31	0:49 - 1:31	0:19 - 1:31	
	75/25	1:05 - 2:02	1:35 - 1:50	0:57 - 1:35	0:34 - 0:57	0:46 - 1:01	0:23 - 0:38	0:08 - 1:01	
	50/50	0:23 - 0:42	0:46 - 0:53	0:23 - 0:46	0:11 - 0:23	0:11 - 0:30	0:11 - 0:15	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:42 - 2:40	2:24 - 2:51	1:24 - 2:24	0:49 - 1:24	0:19 - 1:12	0:15 - 0:23		
	75/25	0:34 - 1:24	1:24 - 1:39	0:49 - 1:24	0:30 - 0:49	0:15 - 0:53	0:11 - 0:19		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:42 - 2:40	2:13 - 2:40	1:20 - 2:13	0:46 - 1:20	0:19 - 1:12[10]	0:15 - 0:23[10]		
	75/25	0:34 - 1:24	1:20 - 1:31	0:46 - 1:20	0:27 - 0:46	0:15 - 0:53[10]	0:11 - 0:19[10]		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:30 - 0:46	0:23 - 0:34	0:07 - 0:23	0:02 - 0:07				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:30 - 0:46	0:08 - 0:15	0:02 - 0:08	0:01 - 0:02				
below -25 to -28 °C (below -13 to -18 °F)	100/0	0:30 - 0:46	0:05 - 0:08	0:02 - 0:05	0:00 - 0:02				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-44: ADJUSTED TYPE IV HOLDOVER TIMES FOR NEWAVE AEROCHEMICAL FCY 9311

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:27 - 3:02	1:46 - 2:13	0:53 - 1:46	0:27 - 0:53	0:53 - 1:31	0:30 - 0:49	0:11 - 1:05	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:27 - 1:35	1:24 - 1:46	0:42 - 1:24	0:23 - 0:42	0:27 - 1:01	0:15 - 0:27		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:27 - 1:35	1:12 - 1:31	0:38 - 1:12	0:19 - 0:38	0:27 - 1:01[10]	0:15 - 0:27[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:23 - 0:42	0:46 - 0:57	0:23 - 0:46	0:11 - 0:23				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:23 - 0:42	0:27 - 0:30	0:11 - 0:27	0:05 - 0:11				
below -25 to -29.5 °C (below -13 to -21 °F)	100/0	0:23 - 0:42	0:23 - 0:30	0:11 - 0:23	0:05 - 0:11				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides allowance times for Type IV PG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

TABLE ADJ-45: ADJUSTED TYPE IV HOLDOVER TIMES FOR NEWAVE AEROCHEMICAL FCY-EGIV

Outside Air Temperature[1]	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist[2], or Ice Crystals[3]	Very Light Snow, Snow Grains or Snow Pellets[4,5,6]	Light Snow, Snow Grains or Snow Pellets[4,5,6]	Moderate Snow, Snow Grains or Snow Pellets[4,6]	Freezing Drizzle[7]	Light Freezing Rain	Rain on Cold-Soaked Wing[8]	Other[9]
-3 °C and above (27 °F and above)	100/0	1:58 - 3:02	1:58 - 2:32	0:53 - 1:58	0:27 - 0:53	1:01 - 1:31	0:30 - 0:49	0:11 - 1:31	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	CAUTION: No holdover time guidelines exist	
below -3 to -8 °C (below 27 to 18 °F)	100/0	1:05 - 2:36	1:39 - 2:05	0:46 - 1:39	0:19 - 0:46	0:38 - 1:31	0:34 - 0:49		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -8 to -14 °C (below 18 to 7 °F)	100/0	1:05 - 2:36	1:27 - 1:50	0:38 - 1:27	0:19 - 0:38	0:38 - 1:31[10]	0:34 - 0:49[10]		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:27 - 1:27	1:12 - 1:35	0:30 - 1:12	0:11 - 0:30				
below -18 to -25 °C (below 0 to -13 °F)	100/0	0:27 - 1:27	0:53 - 1:12	0:23 - 0:53	0:11 - 0:23				
below -25 to -29 °C (below -13 to -20 °F)	100/0	0:27 - 1:27	0:46 - 1:01	0:19 - 0:46	0:08 - 0:19				

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
2 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
3 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
4 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
5 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “light”. No holdover times exist if the reported visibility correlates to a “moderate” or “heavy” precipitation intensity.
6 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
7 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
8 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
9 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides allowance times for Type IV EG fluids in ice pellets and small hail).
10 No holdover time guidelines exist for this condition below -10 °C (14 °F).

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-27.

ADJUSTED HOT GUIDELINES FOR MIXED SNOW AND FREEZING FOG WINTER 2023-2024

The HOT Guidelines are provided for information and guidance purposes. The HOT Guidelines on their own do not change, create, amend or permit deviations from regulatory requirements.

The HOT Guidelines may use mandatory terms such as “must”, “shall” and “is/are required” so as to convey the intent of meeting regulatory requirements and SAE Standards, where applicable. The term “should” is to be understood, unless an alternative method of achieving safety is implemented that would meet or exceed the intent of the recommendation.

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The time of protection will be shortened in heavy weather conditions. Heavy precipitation rates or high moisture content, high wind velocity, or jet blast may reduce holdover time below the lowest time stated in the range. Holdover time may be reduced when aircraft skin temperature is lower than outside air temperature.
- Fluids used during ground de/anti-icing do not provide in-flight icing protection.
- This table is for departure planning only and should be used in conjunction with pretakeoff check procedures

TABLE ADJ-46: ADJUSTED HOLDOVER TIMES FOR SNOW MIXED WITH FREEZING FOG FOR SAE TYPE I, TYPE II, TYPE III, AND TYPE IV FLUIDS[1,2]

Outside Air Temperature	Type I[3] Aluminum	Type I[3] Composite	Type III[4]
below 0 °C to -3 °C (below 32 °F to 27 °F)	0:02 - 0:05	0:02 - 0:02	0:07 - 0:15
below -3 to -6 °C (below 27 to 21 °F)	0:02 - 0:03	0:01 - 0:02	0:07 - 0:15
below -6 to -10 °C (below 21 to 14 °F)	0:02 - 0:02	0:01 - 0:02	0:07 - 0:15
below -10 to -25 °C[6] (below 14 to -13 °F[6])	0:01 - 0:02	0:01 - 0:02	0:07 - 0:15[5]
below -25 °C to LOUT[6] (below -13 °F to LOUT[6])	0:01 - 0:02	0:01 - 0:02	0:04 - 0:08[5]

Outside Air Temperature	Concentration Fluid/Water By % Volume	Type II	Type IV
below 0 °C to -3 °C (below 32 °F to 27 °F)	100/0	0:11 - 0:21	0:11 - 0:23
	75/25	0:06 - 0:11	0:15 - 0:29
	50/50	0:03 - 0:06	0:04 - 0:10
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:08 - 0:15	0:10 - 0:21
	75/25	0:04 - 0:10	0:11 - 0:25
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:06 - 0:11	0:10 - 0:19
	75/25	0:04 - 0:08	0:10 - 0:21
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:01 - 0:03	0:01 - 0:04
below -18 to -25 °C[6] (below 0 to -13 °F[6])	100/0	0:01 - 0:02	0:01 - 0:02
below -25 °C to LOUT[6] (below -13 °F to LOUT[6])	100/0	0:00 - 0:01	0:00 - 0:01

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. HOLDOVER TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 To use the HOTs in this table, ensure that the fluid and dilution being used is listed in the List of Qualified Fluids Tested for Anti-Icing Performance and Aerodynamic Acceptance table (Table 51 -Table 54). Any restrictions on the use of the fluid have to be identified and applied.
2 These holdover times are for use in -SN FZFG and SN FZFG. The Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required to confirm the precipitation intensity is no greater than “moderate”. No holdover times exist if the reported visibility correlates to a “heavy” precipitation intensity.
3 Type I Fluid / Water Mixture must be selected so that the freezing point of the mixture is at least 10 °C (18 °F) below outside air temperature.
4 To use the Type III fluid holdover times, the fluid brand being used must be known. AllClear AeroClear MAX must be applied unheated.
5 No holdover time guidelines exist below -16°C (3°F) for low speed aircraft and below -20.5 °C (-5 °F) middle speed aircraft. If uncertain whether the aircraft conforms to the low, middle, or high speed aerodynamic test criterion, no holdover time guidelines exist below -16°C (3°F).
6 Ensure that the lowest operational use temperature (LOUT) is respected. If the LOUT is unknown, no holdover time guidelines exist below -25 °C (-13 °F) for Type II fluids and below -25.5 °C (-14 °F) for Type IV fluids.

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page A-54.

ADJUSTED ALLOWANCE TIMES TABLES FOR WINTER 2023-2024

The HOT Guidelines are provided for information and guidance purposes. The HOT Guidelines on their own do not change, create, amend or permit deviations from regulatory requirements.

The HOT Guidelines may use mandatory terms such as “must”, “shall” and “is/are required” so as to convey the intent of meeting regulatory requirements and SAE Standards, where applicable. The term “should” is to be understood, unless an alternative method of achieving safety is implemented that would meet or exceed the intent of the recommendation.

CAUTIONS

- The responsibility for the application of these data remains with the user.
- Fluids used during ground de/anti-icing do not provide in-flight icing protection.
- This table is for departure planning only and should be used in conjunction with pretakeoff check procedures.
- Allowance time cannot be extended by an inspection of the aircraft critical surfaces.

TABLE ADJ-47: ADJUSTED ALLOWANCE TIMES FOR SAE TYPE III FLUIDS[1,2]

Precipitation Types or Combinations	Applicable METAR Codes	Outside Air Temperature		
		-5 °C and above (23 °F and above)	Below -5 to -10 °C (Below 23 to 14 °F)	Below -10 °C[3] (Below 14 °F)
Light Ice Pellets	**-PL**	8 minutes	8 minutes	**Caution: No allowance times currently exist**
Light Ice Pellets Mixed with Light Snow	**-PL SN, -SN PL**	8 minutes	8 minutes	
Light Ice Pellets Mixed with Light Freezing Drizzle or Moderate Freezing Drizzle	**-PL FZDZ, -FZDZ PL, FZDZ PL**	5 minutes	4 minutes	
Light Ice Pellets Mixed with Light Drizzle or Moderate Drizzle	**-PL DZ, -DZ PL, DZ PL**	5 minutes[4]		
Light Ice Pellets Mixed with Light Freezing Rain	**-PL FZRA, -FZRA PL**	5 minutes	4 minutes	
Light Ice Pellets Mixed with Light Rain	**-PL RA, -RA PL**	5 minutes[5]		
Moderate Ice Pellets (or Small Hail[6])	**PL, GS**	4 minutes	4 minutes	

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. ALLOWANCE TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 These allowance times are for use with undiluted (100/0) fluids applied unheated on aircraft with rotation speeds of 100 knots or greater.
2 Takeoff is allowed up to 90 minutes after start of fluid application if the precipitation stops at or before the allowance time expires and does not restart. The OAT must not decrease during the 90 minutes to use this guidance in conditions of light ice pellets mixed with either: light freezing drizzle, moderate freezing drizzle, light freezing rain, or light rain.
3 Ensure that the lowest operational use temperature (LOUT) is respected.
4 No allowance times exist in this condition for temperatures of 0 °C and below; consider use of light ice pellets mixed with light freezing drizzle or moderate freezing drizzle.
5 No allowance times exist in this condition for temperatures of 0 °C and below; consider use of light ice pellets mixed with light freezing rain.
6 In the US, small hail is reported by METAR as GR and the remarks section is used to indicate “GR LESS THAN ¼”. Outside of the US the METAR code GS is used to indicate small hail when it is less than 5 mm and GR to indicate hail when it is 5mm or greater. If METAR does not report an intensity for small hail, use the “moderate ice pellets or small hail” allowance times. If METAR reports an intensity with small hail, the ice pellet condition with the equivalent intensity can be used, e.g. if light small hail is reported, the “light ice pellets” allowance times can be used. This also applies in mixed conditions, e.g. if light small hail mixed with light snow is reported, use the “light ice pellets mixed with light snow” allowance times.

CAUTIONS

- The cautions that apply to the allowance times in the table above can be found on page A-56.

TABLE ADJ-48: ADJUSTED ALLOWANCE TIMES FOR SAE TYPE IV ETHYLENE GLYCOL (EG) FLUIDS[1,2]

Precipitation Types or Combinations	Applicable METAR Codes	Outside Air Temperature			
		-5 °C and above[3] (23 °F and above)	Below -5 to -10 °C[3] (Below 23 to 14 °F)	Below -10 to -16 °C[3] (Below 14 to 3 °F)	Below -16 to -22 °C[3,4] (Below 3 to -8 °F)
Light Ice Pellets	**-PL**	53 minutes	38 minutes	38 minutes	23 minutes
Light Ice Pellets Mixed with Light Snow	**-PL SN, -SN PL**	38 minutes	23 minutes	19 minutes	
Light Ice Pellets Mixed with Light Freezing Drizzle or Moderate Freezing Drizzle	**-PL FZDZ, -FZDZ PL, FZDZ PL**	30 minutes	23 minutes	**Caution: No allowance times currently exist**	
Light Ice Pellets Mixed with Light Drizzle or Moderate Drizzle	**-PL DZ, -DZ PL, DZ PL**	30 minutes[5]			
Light Ice Pellets Mixed with Light Freezing Rain	**-PL FZRA, -FZRA PL**	30 minutes	23 minutes		
Light Ice Pellets Mixed with Light Rain	**-PL RA, -RA PL**	30 minutes[6]			
Moderate Ice Pellets (or Small Hail[7])	**PL, GS**	27 minutes	19 minutes	11 minutes	8 minutes
Moderate Ice Pellets (or Small Hail[7]) Mixed with Moderate Freezing Drizzle	**PL FZDZ, GS FZDZ,**	15 minutes	8 minutes	**Caution: No allowance times currently exist**	
Moderate Ice Pellets (or Small Hail[7]) Mixed with Moderate Drizzle	**PL DZ, GS DZ**	15 minutes[8]			
Moderate Ice Pellets (or Small Hail[7]) Mixed with Moderate Rain	**PL RA, GS RA, RA PL, RA GS**	11 minutes[9]			

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. ALLOWANCE TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 These allowance times are for use with undiluted (100/0) ethylene glycol (EG) based fluids applied on aircraft with rotation speeds of 100 knots or greater. The following fluids are EG based; ALAB International PROFLIGHT EG4, AllClear ClearWing EG, ASGlobal 4Flite EG, AVIAFLUID AVIAFlight EG, CHEMCO ChemR EG IV, CHEMCO ChemR Nordik IV, Clariant Max Flight AVIA, Clariant Safewing EG IV NORTH, Dow EG106, JSC RCP Nordix Defrost NORTH 4, and Newave Aerochemical FCY-EGIV. If the glycol type is unknown, the allowance times for SAE Type IV PG fluids should be used.

2 Takeoff is allowed up to 90 minutes after start of fluid application if the precipitation stops at or before the allowance time expires and does not restart. The OAT must not decrease during the 90 minutes to use this guidance in conditions of light ice pellets mixed with either: light freezing drizzle, moderate freezing drizzle, light freezing rain, or light rain

3 No allowance times exist for ethylene glycol (EG) fluids when used on aircraft with rotation speeds less than 100 knots.

4 Ensure that the lowest operational use temperature (LOUT) is respected.

5 No allowance times exist in this condition for temperatures of 0 °C and below; consider use of light ice pellets mixed with light freezing drizzle or moderate freezing drizzle.

6 No allowance times exist in this condition for temperatures of 0 °C and below; consider use of light ice pellets mixed with light freezing rain.

7 In the US, small hail is reported by METAR as GR and the remarks section is used to indicate “GR LESS THAN ¼”. Outside of the US the METAR code GS is used to indicate small hail when it is less than 5 mm and GR to indicate hail when it is 5mm or greater. If METAR does not report an intensity for small hail, use the “moderate ice pellets or small hail” allowance times. If METAR reports an intensity with small hail, the ice pellet condition with the equivalent intensity can be used, e.g. if light small hail is reported, the “light ice pellets” allowance times can be used. This also applies in mixed conditions, e.g. if light small hail mixed with light snow is reported, use the “light ice pellets mixed with light snow” allowance times.

8 No allowance times exist in this condition for temperatures of 0 °C and below; consider use of moderate ice pellets (or small hail) mixed with moderate freezing drizzle.

9 No allowance times exist in this condition for temperatures of 0 °C and below.

CAUTIONS

- The cautions that apply to the allowance times in the table above can be found on page A-56.

TABLE ADJ-49: ADJUSTED ALLOWANCE TIMES FOR SAE TYPE IV PROPYLENE GLYCOL (PG) FLUIDS[1,2]

Precipitation Types or Combinations	Applicable METAR Codes	Outside Air Temperature			
		-5 °C and above[3] (23 °F and above)	Below -5 to -10 °C[3] (Below 23 to 14 °F)	Below -10 to -16 °C[4] (Below 14 to 3 °F)	Below -16 to -22 °C[4,5] (Below 3 to -8 °F)
Light Ice Pellets	**-PL**	38 minutes	23 minutes	23 minutes	15 minutes
Light Ice Pellets Mixed with Light Snow	**-PL SN, -SN PL**	30 minutes	11 minutes	11 minutes	
Light Ice Pellets Mixed with Light Freezing Drizzle or Moderate Freezing Drizzle	**-PL FZDZ, -FZDZ PL, FZDZ PL**	19 minutes	8 minutes		
Light Ice Pellets Mixed with Light Drizzle or Moderate Drizzle	**-PL DZ, -DZ PL, DZ PL**	19 minutes[6]		**Caution: No allowance times currently exist**	
Light Ice Pellets Mixed with Light Freezing Rain	**-PL FZRA, -FZRA PL**	19 minutes	8 minutes		
Light Ice Pellets Mixed with Light Rain	**-PL RA, -RA PL**	19 minutes[7]			
Moderate Ice Pellets (or Small Hail[8])	**PL, GS**	11 minutes	8 minutes	8 minutes	
Moderate Ice Pellets (or Small Hail[8]) Mixed with Moderate Freezing Drizzle	**PL FZDZ, GS FZDZ**	8 minutes	5 minutes		
Moderate Ice Pellets (or Small Hail[8]) Mixed with Moderate Drizzle	**PL DZ, GS DZ**	8 minutes[9]		**Caution: No allowance times currently exist**	
Moderate Ice Pellets (or Small Hail[8]) Mixed with Moderate Rain	**PL RA, GS RA, RA PL, RA GS**	8 minutes[10]			

THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING. ALLOWANCE TIMES HAVE BEEN ADJUSTED TO 76 PERCENT.

NOTES

1 These allowance times are for use with undiluted (100/0) propylene glycol (PG) based fluids. All Type IV fluids are PG based with the exception of ALAB International PROFLIGHT EG4, AllClear ClearWing EG, ASGlobal 4Flite EG, AVIAFLUID AVIAFlight EG, CHEMCO ChemR EG IV, CHEMCO ChemR Nordik IV, Clariant Max Flight AVIA, Clariant Safewing EG IV NORTH, Dow EG106, JSC RCP Nordix Defrost NORTH 4, and Newave Aerochemical FCY-EGIV, which are ethylene glycol (EG) based. If the glycol type is unknown, the allowance times for SAE Type IV PG fluids should be used.

2 Takeoff is allowed up to 90 minutes after start of fluid application if the precipitation stops at or before the allowance time expires and does not restart. The OAT must not decrease during the 90 minutes to use this guidance in conditions of light ice pellets mixed with either: light freezing drizzle, moderate freezing drizzle, light freezing rain, or light rain.

3 No allowance times exist for PG based fluids when used on aircraft with rotation speeds less than 100 knots.

4 No allowance times exist for PG based fluids when used on aircraft with rotation speeds less than 115 knots.

5 Ensure that the lowest operational use temperature (LOUT) is respected.

6 No allowance times exist in this condition for temperatures of 0 °C and below; consider use of light ice pellets mixed with light freezing drizzle or moderate freezing drizzle.

7 No allowance times exist in this condition for temperatures of 0 °C and below; consider use of light ice pellets mixed with light freezing rain.

8 In the US, small hail is reported by METAR as GR and the remarks section is used to indicate “GR LESS THAN ¼”. Outside of the US the METAR code GS is used to indicate small hail when it is less than 5 mm and GR to indicate hail when it is 5mm or greater. If METAR does not report an intensity for small hail, use the “moderate ice pellets or small hail” allowance times. If METAR reports an intensity with small hail, the ice pellet condition with the equivalent intensity can be used, e.g. if light small hail is reported, the “light ice pellets” allowance times can be used. This also applies in mixed conditions, e.g. if light small hail mixed with light snow is reported, use the “light ice pellets mixed with light snow” allowance times.

9 No allowance times exist in this condition for temperatures of 0 °C and below; consider use of moderate ice pellets (or small hail) mixed with moderate freezing drizzle.

10 No allowance times exist in this condition for temperatures of 0 °C and below.

CAUTIONS

- The cautions that apply to the allowance times in the table above can be found on page A-56.

APPENDIX B:
TESTING LABORATORIES

TESTING LABORATORIES

The following laboratories are known to provide testing for de/anti-icing fluids given they verifiably adhere to internationally accepted standards and recommended practices that are associated with the holdover times published by the FAA.

Please enquire directly with the laboratories for a full list of testing available.

- **Anti-icing Materials International Laboratory (AMIL):** 555, boulevard de l'Université, Chicoutimi, Québec, G7H 2B1, Canada, 418-545-5011 ext. 2406, www.amillaboratory.ca. Provides testing for anti-icing performance (described in AMS1424, AMS1428, and AS5901), aerodynamic acceptance (described in AMS1424, AMS1428 and AS5900), physical properties including fluid stability (described in AMS1424 and AMS1428), environmental information (described in AMS1424 and AMS1428) and most of tests to evaluate materials compatibility (described in AMS1424 and AMS1428).

- **APS Aviation Inc.:** 6700, chemin de la Côte-de-Liesse, Suite 102, Saint-Laurent, Quebec, H4T 2B5, Canada, 514-878-4388 www.apsaviation.ca. Provides endurance time testing (described in ARP5485B and ARP5945A).

- **Scientific Material International (SMI):** 12219 SW 131st Avenue, Miami, Florida, USA 33186-6401; 305-971-7047, www.smiinc.com. Provides testing for physical properties including fluid stability (described in AMS1424 and AMS1428), environmental information (described in AMS1424 and AMS1428) and most of tests to evaluate materials compatibility (described in AMS1424 and AMS1428).

APPENDIX C:
AIRCRAFT DEICING FLUID (ADF)/AIRCRAFT ANTI-ICING FLUID (AAF) MANUFACTURERS

TABLE C-1: ADF/AAF MANUFACTURERS CONTACT INFORMATION*

Fluid Manufacturer	Primary contact	Email Address
ABAX Industries	Cristina Poupet	c.poupet@abax.eu
ADDCON EUROPE GmbH	Norman Kilian	norman.kilian@addcon.com
Aero Mag 2000 SYR LLC	Mark Vilcek	m.vilcek@aeromag2000.com
ALAB Industries	Marat Zhazbek	info@alab.kz
Alab International	Kuanyshbay Bissenov	deicing@alab.kz
AllClear Systems LLC	Steve Szafara	SSzafara@allclearsys.com
Arcton Ltd.	Bulat Hamitov	bulathamitov@yandex.ru
ASGlobal	Paulo de Oliveira	paulo@asglobal.biz
AVIAFLUID International Ltd	Igor Derbasov	info@aviafluid.ru
Aviation Xi'an High-Tech Physical Chemical Co. Ltd.	Arella	xiangaokelihua@163.com
Beijing Wangye Aviation Chemical Product Co Ltd.	Sina Gong	hswgyh@sina.com
Beijing Yadilite Aviation Advanced Materials Corporation	Kewei Wang	wangkewei@yadilite.com
CHEMCO Inc.	Claude Grenon	claude.grenon@chemco-inc.com
Clariant Produkte (Deutschland) GmbH	Andreas Brueck	andreas.brueck@clariant.com
Cryotech Deicing Technology	Melissa Copeland	melissa.copeland@cryotech.com
Dow Chemical Company	Sarah Venckeleer	fdeicer@dow.com.
Gansu xiexin huineng Science and technology development Co.,Ltd.	*Not Available*	*Not Available*
Heilongjiang Hangjie Aero-chemical Technology Co. Ltd.	Wang Dawen	dawen_hrb@163.com
HOC Industries	Jeremy Wilcoxson	jwilcoxson@hocindustries.com
Inland Technologies Inc.	Alex McLeod	amcleod@inlandgroup.ca
JSC RCP Nordix	Ruslan Ukraintsev	defrost@nordway.ru
Kilfrost Limited	Lee Stokes	lee.stokes@kilfrost.com
LNT Solutions	Philip Newton	philip.newton@lntsolutions.com
MKS DevO Chemical Co	Efe Dikergil	efe.dikergil@mksdevo.com
Newave Aerochemical Co. Ltd.	Peng Aiqun	lwgs@newave.cn
ROMCHIM PROTECT SRL	Eugenia Hongu	contact@romchimprotect.ro
Shaanxi Cleanway Aviation Chemical Co., Ltd	Arella	xiangaokelihua@163.com
Topan LLC	Almat Kurmanov	almat.kurmanov@topan.kz
Xinjiang Zhongtian Liyang Chemical Technology Co., Ltd	Huang Liang	heima.54@foxmail.com

*Contact information provided above is the latest information as of the time of publication, August 2, 2023.