

Transport Canada Holdover Time (HOT) Guidelines Winter 2021-2022

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This document should be used in conjunction with the most recent version of the TP 14052E - *Guidelines for Aircraft Ground Icing Operations*. These two documents complement each other and should be used together for a thorough understanding of the subject matter.

Questions or comments on the content of the holdover time guidelines should be addressed to Transport Canada Civil Aviation Communication Centre
Telephone 1-800-305-2059 Facsimile 613-957-4208 e-mail services@tc.gc.ca

To receive notification of HOT Guideline updates, subscribe to or update your e-news subscription at the following Transport Canada Web site:
<http://wwwapps.tc.gc.ca/Comm/5/ListServ/menu.aspx>. Subscribing to e-news will require an email address and selecting Holdover Time (HOT) Guidelines under Publications / Air Transportation / Aviation Safety - Safety Information.

CHANGE CONTROL RECORDS

This page indicates any changes made to individual pages within the document. Changed pages have sidebars 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://tc.canada.ca/en/aviation/general-operating-flight-rules/holdover-time-hot-guidelines-icing-anti-icing-aircraft>.

<i>REVISION</i>	<i>DATE</i>	<i>DESCRIPTION OF CHANGES</i>	<i>AFFECTED PAGES</i>	<i>AUTHOR</i>

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HOW TO USE THIS DOCUMENT

Complementary Documents

This document should be used in conjunction with the most recent version of the TP 14052E - Guidelines for Aircraft Ground Icing Operations. These 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, Transport Canada 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 Transport Canada HOT Guidelines. This database can be found at <https://tc.canada.ca/en/aviation/general-operating-flight-rules/holdover-time-hot-guidelines-icing-anti-icing-aircraft>. Guidance and conditions on the use of DSHOT data can be found in Advisory Circular (AC) 700-061 at <https://tc.canada.ca/en/aviation/reference-centre/advisory-circulars/advisory-circular-ac-no-ac-700-061>.

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://tc.canada.ca/en/aviation/general-operating-flight-rules/holdover-time-hot-guidelines-icing-anti-icing-aircraft>.

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 2021-2022: 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.
- 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.
- 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.

HIGHLIGHTS AND CHANGES FOR WINTER 2021-2022

CHANGED FROM PREVIOUS YEAR

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

How to Use this Document

- A paragraph was added under “Complementary Documents” describing where to find the degree-specific holdover times and related guidance material.

Holdover Time Tables

- Fluid-specific HOT guidelines have been created for nine new fluids: ROMCHIM ADD-PROTECT NG Type II (Type II), AVIAFLUID AVIAFlight EG (Type IV), AVIAFLUID AVIAFlight PG (Type IV), AllClear ClearWing ECO (Type IV), ASGlobal 4Flite EG (Type IV), ASGlobal 4Flite PG (Type IV), CHEMCO ChemR Nordik IV (Type IV), JSC RCP Nordix Defrost NORTH 4 (Type IV), and Newave Aerochemical FCY-EGIV (Type IV).
- The HOT guidelines for Kilfroast Ice Clear II and LNT Solution E450 have been removed.
- Minor decreases have been made to the Type II generic holdover times as a result of the new fluids and data.
- Several decreases have been made to the Type IV generic holdover times as a result of the new fluids and data.
- Further testing in very cold snow conditions has enabled fluid-specific holdover times to be provided in very cold snow (below -14 °C) for the ten Type II/IV fluids listed below.
 - AVIAFLUID AVIAFlight EG (Type IV)
 - AVIAFLUID AVIAFlight PG (Type IV)
 - AllClear ClearWing ECO (Type IV)
 - AllClear ClearWing EG (Type IV)
 - Aviation Shaanxi Cleanwing II (Type II)
 - CHEMCO ChemR EG IV (Type IV)
 - CHEMCO ChemR Nordik IV (Type IV)
 - Cryotech Polar Guard Xtend (Type IV)
 - Newave Aerochemical FCY 9311 (Type IV)
 - Newave Aerochemical FCY-EGIV (Type IV)
- The HOT table for Aviation Shaanxi Cleanwing II (Type II) has been expanded to include 3 columns in snow. Holdover times have been added and updated for Light, Very Light, and Moderate snow as a result of additional data being collected.
- The “Freezing Fog or Ice Crystals” column has been modified to “Freezing Fog, Freezing Mist or Ice Crystals” and a note was added to all HOT tables to address Freezing Mist. Freezing mist is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below. Freezing mist is best confirmed by observation. Mist must be reported alone in order to use the holdover times in the “Freezing Fog, Freezing Mist, or Ice Crystals” column in the holdover time tables. If mist is reported mixed with another precipitation condition these holdover times do not apply and mist could be treated as an obscuration.
- Notes 5, in the Type I and Type III holdover time (HOT) tables, and 4 in the Type II and Type IV HOT tables have been modified to allow for the use of light freezing rain holdover times in conditions of very light or light snow mixed with drizzle.

Allowance Times Tables

- A separate ice pellet allowance time table for Type IV EG based fluids was created and editorial changes were made to the notes in both the Type IV EG and Type IV PG allowance time tables to reflect this change.
- Precipitation intensity designators were added to mixed condition second precipitation types in all allowance times tables.
- A column was added to all allowance times tables to indicate the applicable METAR codes for each precipitation type.
- The notes in all allowance times tables related to Light Ice Pellets Mixed with Rain, and Moderate Ice Pellets (or Small Hail) Mixed with Rain have been reworded to indicate that no allowance times exist in these conditions for temperatures of 0°C and below.
- The note in all allowance times tables related to small hail has been expanded to explain the differences in reporting small hail in the United States and outside of the United States.

Supplemental Guidance

- The list of fluids (Tables 51, 52, 53 and 54) has been updated to reflect the latest information available on all de/anti-icing fluids.

UNCHANGED FROM PREVIOUS YEAR**Holdover Time Tables**

- The active frost holdover time (HOT) guidelines are unchanged.

Allowance Times Tables

- The fluid application tables are unchanged.

HOLDOVER TIME (HOT) GUIDELINES FOR WINTER 2021-2022

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

Outside Air Temperature ^{1,2,3}	Type I	Outside Air Temperature ^{2,3}	Concentration Fluid/Water By % Volume	Type II	Type III ⁴	Type IV
-1°C and above (30°F and above)	0:45 (0:35) ⁵	-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)		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)		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)		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)		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)		below -21 to -25°C (below -6 to -13°F)	100/0	2:00	2:00	4:00
below -25°C to LOUT (below -13°F to LOUT)		below -25°C (below -13°F)	100/0	No Holdover Time Guidelines Exist		

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 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.
- 4 To use the Type III fluid frost holdover times, the fluid brand being used must be known. AllClear AeroClear MAX must be applied unheated.
- 5 Value in parentheses is for aircraft with critical surfaces that are predominantly or entirely constructed of composite materials.

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.

**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	Very Light Snow, Snow Grains or Snow Pellets ^{4,5}	Light Snow, Snow Grains or Snow Pellets ^{4,5}	Moderate Snow, Snow Grains or Snow Pellets ⁴	Freezing Drizzle ⁶	Light Freezing Rain	Rain on Cold-Soaked Wing ⁷	Other ⁸
-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	0:04 - 0:06	0:02 - 0:05	CAUTION: No holdover time guidelines exist
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	0:04 - 0:06		
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 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.
- 6 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 7 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 8 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.

CAUTIONS

- These holdover times apply to aircraft with critical surfaces constructed predominantly or entirely of aluminum materials that have demonstrated satisfactory use of these holdover times.
- The responsibility for the application of these data remains with the user.
- Takeoff after the longest applicable holdover time has been exceeded is not permitted for Type I fluids.
- 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.

**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	Very Light Snow, Snow Grains or Snow Pellets ^{4,5}	Light Snow, Snow Grains or Snow Pellets ^{4,5}	Moderate Snow, Snow Grains or Snow Pellets ⁴	Freezing Drizzle ⁶	Light Freezing Rain	Rain on Cold-Soaked Wing ⁷	Other ⁸
-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	0:04 - 0:06	0:01 - 0:05	CAUTION: No holdover time guidelines exist
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	0:04 - 0:06		
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 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.
- 6 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 7 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 8 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.

CAUTIONS

- These holdover times apply to newer aircraft with critical surfaces constructed predominantly or entirely of composite materials.
- The responsibility for the application of these data remains with the user.
- Takeoff after the longest applicable holdover time has been exceeded is not permitted for Type I fluids.
- 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.

TABLE 4: GENERIC HOLDOVER TIMES FOR SAE TYPE II FLUIDS

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ² , or Ice Crystals	Snow, Snow Grains or Snow Pellets ^{3,4}	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	0:55 - 1:50	0:25 - 0:50	0:30 - 1:00	0:20 - 0:35	0:07 - 0:45	CAUTION: No holdover time guidelines exist
	75/25	0:25 - 0:55	0:15 - 0:25	0:15 - 0:40	0:10 - 0:20	0:04 - 0:25	
	50/50	0:15 - 0:25	0:05 - 0:10	0:08 - 0:15	0:06 - 0:09		
below -3 to -8°C (below 27 to 18°F)	100/0	0:30 - 0:45	0:20 - 0:35	0:20 - 0:45	0:15 - 0:20		
	75/25	0:25 - 0:50	0:10 - 0:20	0:15 - 0:25	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 ⁸	0:15 - 0:20 ⁸		
	75/25	0:25 - 0:50	0:08 - 0:20	0:15 - 0:25 ⁸	0:08 - 0:15 ⁸		
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 ⁹ (below 0 to -13°F)	100/0	0:15 - 0:20	0:01 - 0:03				
below -25°C to LOU ⁹ (below -13°F to LOU)	100/0	0:15 - 0:20	0:00 - 0:01				

NOTES

- 1 Ensure that the lowest operational use temperature (LOU) 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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).
- 9 If the LOU is unknown, no holdover time guidelines exist below -25°C (-13°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold- Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:20 - 3:00	2:00 - 2:00	1:15 - 2:00	0:40 - 1:15	0:40 - 1:40	0:30 - 0:45	0:09 - 1:25	CAUTION: No holdover time guidelines exist
	75/25	1:15 - 1:25	1:45 - 2:00	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		
below -3 to -8°C (below 27 to 18°F)	100/0	0:45 - 2:30	2:00 - 2:00	1:00 - 2:00	0:30 - 1:00	0:25 - 1:10	0:20 - 0:30		
	75/25	0:35 - 1:55	1:40 - 2:00	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 - 2:00	0:55 - 1:45	0:30 - 0:55	0:25 - 1:10 ⁸	0:20 - 0:30 ⁸		
	75/25	0:35 - 1:55	1:35 - 2:00	0:50 - 1:35	0:25 - 0:50	0:15 - 0:55 ⁸	0:20 - 0:35 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 6: TYPE II HOLDOVER TIMES FOR AVIATION SHAANXI HI-TECH CLEANWING II

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ² , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-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	CAUTION: No holdover time guidelines exist
	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		
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 ⁸	0:20 - 0:25 ⁸		
	75/25	0:40 - 1:45	1:20 - 1:35	0:45 - 1:20	0:25 - 0:45	0:35 - 0:40 ⁸	0:20 - 0:25 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 7: TYPE II HOLDOVER TIMES FOR BEIJING YADILITE AVIATION YD-102 TYPE II

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ² , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold- Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:10 - 2:00	1:40 - 2:00	0:50 - 1:40	0:25 - 0:50	0:40 - 1:15	0:35 - 0:40	0:10 - 1:00	CAUTION: No holdover time guidelines exist
	75/25	0:25 - 0:55	0:50 - 1:05	0:25 - 0:50	0:15 - 0:25	0:15 - 0:40	0:10 - 0:20	0:04 - 0:25	
	50/50	0:15 - 0:25	0:25 - 0:30	0:10 - 0:25	0:05 - 0:10	0:08 - 0:15	0:07 - 0:09		
below -3 to -8°C (below 27 to 18°F)	100/0	0:45 - 1:30	1:15 - 1:30	0:35 - 1:15	0:20 - 0:35	0:35 - 0:50	0:25 - 0:25		
	75/25	0:30 - 0:50	0:40 - 0:50	0:20 - 0:40	0:10 - 0:20	0:15 - 0:25	0:09 - 0:15		
below -8 to -14°C (below 18 to 7°F)	100/0	0:45 - 1:30	1:00 - 1:15	0:30 - 1:00	0:15 - 0:30	0:35 - 0:50 ⁸	0:25 - 0:25 ⁸		
	75/25	0:30 - 0:50	0:35 - 0:45	0:20 - 0:35	0:08 - 0:20	0:15 - 0:25 ⁸	0:09 - 0:15 ⁸		
below -14 to -18°C (below 7 to 0°F)	100/0	0:20 - 0:45	0:20 - 0:30	0:07 - 0:20	0:02 - 0:07				
below -18 to -25°C (below 0 to -13°F)	100/0	0:20 - 0:45	0:09 - 0:15	0:03 - 0:09	0:01 - 0:03				
below -25 to -29°C (below -13 to -20°F)	100/0	0:20 - 0:45	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 8: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	3:30 - 4:00	2:00 - 2:00	1:35 - 2:00	1:00 - 1:35	1:20 - 2:00	0:45 - 1:25	0:10 - 1:30	CAUTION: No holdover time guidelines exist
	75/25	1:50 - 2:45	2:00 - 2:00	1:20 - 2:00	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		
below -3 to -8°C (below 27 to 18°F)	100/0	0:55 - 1:45	2:00 - 2:00	1:15 - 2:00	0:45 - 1:15	0:35 - 1:30	0:25 - 0:45		
	75/25	0:25 - 1:05	1:45 - 2:00	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 - 2:00	1:05 - 1:50	0:40 - 1:05	0:35 - 1:30 ⁸	0:25 - 0:45 ⁸		
	75/25	0:25 - 1:05	1:20 - 1:40	0:40 - 1:20	0:20 - 0:40	0:25 - 1:10 ⁸	0:20 - 0:35 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 9: 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	Snow, Snow Grains or Snow Pellets ^{3,4}	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-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	CAUTION: No holdover time guidelines exist
	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		
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 ⁸	0:35 - 0:55 ⁸		
	75/25	0:30 - 1:45	0:55 - 1:40	0:25 - 1:10 ⁸	0:30 - 0:45 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 10: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:50 - 4:00	2:00 - 2:00	1:55 - 2:00	1:05 - 1:55	1:35 - 2:00	1:15 - 1:30	0:15 - 2:00	CAUTION: No holdover time guidelines exist
	75/25	2:30 - 4:00	2:00 - 2:00	1:25 - 2:00	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		
below -3 to -8°C (below 27 to 18°F)	100/0	0:55 - 2:30	2:00 - 2:00	1:25 - 2:00	0:50 - 1:25	0:35 - 1:35	0:35 - 0:45		
	75/25	0:40 - 1:30	2:00 - 2:00	1:05 - 2:00	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 - 2:00	1:10 - 2:00	0:40 - 1:10	0:35 - 1:35 ⁸	0:35 - 0:45 ⁸		
	75/25	0:40 - 1:30	2:00 - 2:00	0:55 - 2:00	0:25 - 0:55	0:25 - 1:05 ⁸	0:35 - 0:45 ⁸		
below -14 to -18°C (below 7 to 0°F)	100/0	0:25 - 0:50	1:35 - 2:00	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 11: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold- Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	0:55 - 1:50	1:50 - 2:00	0:55 - 1:50	0:30 - 0:55	0:30 - 1:00	0:20 - 0:35	0:10 - 1:20	CAUTION: No holdover time guidelines exist
	75/25	1:05 - 2:00	1:45 - 2:00	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	2:00 - 2:00	1:00 - 2:00	0:30 - 1:00	0:30 - 0:50	0:15 - 0:30		
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 ⁸	0:20 - 0:30 ⁸		
	75/25	0:40 - 1:20	0:55 - 1:05	0:25 - 0:55	0:10 - 0:25	0:25 - 0:40 ⁸	0:15 - 0:20 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 12: 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	Snow, Snow Grains or Snow Pellets ^{3,4}	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-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	CAUTION: No holdover time guidelines exist
	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		
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 ⁸	0:15 - 0:35 ⁸		
	75/25	0:25 - 1:25	0:35 - 1:05	0:20 - 0:55 ⁸	0:09 - 0:30 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 13: 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	Snow, Snow Grains or Snow Pellets ^{3,4}	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-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	CAUTION: No holdover time guidelines exist
	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		
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 ⁸	0:15 - 0:20 ⁸		
	75/25	0:30 - 1:05	0:10 - 0:20	0:15 - 0:30 ⁸	0:08 - 0:15 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

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

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ² , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold- Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:25 - 2:30	2:00 - 2:00	1:05 - 2:00	0:30 - 1:05	0:50 - 1:20	0:25 - 0:45	0:08 - 1:15	CAUTION: No holdover time guidelines exist
	75/25	0:45 - 1:20	1:20 - 1:40	0:40 - 1:20	0:20 - 0:40	0:25 - 0:50	0:15 - 0:25	0:06 - 0:35	
	50/50	0:15 - 0:30	0:25 - 0:30	0:15 - 0:25	0:08 - 0:15	0:10 - 0:20	0:08 - 0:10		
below -3 to -8°C (below 27 to 18°F)	100/0	0:40 - 1:30	1:25 - 1:50	0:40 - 1:25	0:20 - 0:40	0:35 - 1:05	0:15 - 0:30		
	75/25	0:30 - 1:05	0:50 - 1:05	0:25 - 0:50	0:10 - 0:25	0:20 - 0:35	0:15 - 0:20		
below -8 to -14°C (below 18 to 7°F)	100/0	0:40 - 1:30	1:00 - 1:15	0:30 - 1:00	0:15 - 0:30	0:35 - 1:05 ⁸	0:15 - 0:30 ⁸		
	75/25	0:30 - 1:05	0:35 - 0:45	0:20 - 0:35	0:08 - 0:20	0:20 - 0:35 ⁸	0:15 - 0:20 ⁸		
below -14 to -18°C (below 7 to 0°F)	100/0	0:20 - 1:00	0:20 - 0:30	0:07 - 0:20	0:02 - 0:07				
below -18 to -25°C (below 0 to -13°F)	100/0	0:20 - 1:00	0:09 - 0:15	0:03 - 0:09	0:01 - 0:03				
below -25 to -28.5°C (below -13 to -19°F)	100/0	0:20 - 1:00	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold- Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:10 - 2:25	2:00 - 2:00	1:10 - 2:00	0:35 - 1:10	0:50 - 1:20	0:35 - 0:50	0:07 - 1:10	CAUTION: No holdover time guidelines exist
	75/25	1:00 - 1:50	1:55 - 2:00	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		
below -3 to -8°C (below 27 to 18°F)	100/0	0:55 - 1:35	1:50 - 2:00	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 ⁸	0:25 - 0:35 ⁸		
	75/25	0:55 - 1:25	1:05 - 1:25	0:30 - 1:05	0:15 - 0:30	0:25 - 1:05 ⁸	0:20 - 0:30 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:40 - 3:30	1:55 - 2:00	1:00 - 1:55	0:30 - 1:00	0:40 - 1:35	0:25 - 0:45	0:09 - 0:50	CAUTION: No holdover time guidelines exist
	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		
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 ⁸	0:20 - 0:30 ⁸		
	75/25	0:30 - 0:55	0:35 - 0:40	0:20 - 0:35	0:09 - 0:20	0:20 - 0:30 ⁸	0:15 - 0:20 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE 17: TYPE III HOLDOVER TIMES FOR ALLCLEAR AEROCLEAR MAX
APPLIED UNHEATED ON LOW SPEED AIRCRAFT¹**

Outside Air Temperature ²	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ³ , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{4,5}	Light Snow, Snow Grains or Snow Pellets ^{4,5}	Moderate Snow, Snow Grains or Snow Pellets ⁴	Freezing Drizzle ⁶	Light Freezing Rain	Rain on Cold-Soaked Wing ⁷	Other ⁸
-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	CAUTION: No holdover time guidelines exist
	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 -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.
- 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 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.
- 6 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 7 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 8 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE 18: TYPE III HOLDOVER TIMES FOR ALL CLEAR AERO CLEAR MAX
APPLIED UNHEATED ON HIGH SPEED AIRCRAFT¹**

Outside Air Temperature ²	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ³ , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{4,5}	Light Snow, Snow Grains or Snow Pellets ^{4,5}	Moderate Snow, Snow Grains or Snow Pellets ⁴	Freezing Drizzle ⁶	Light Freezing Rain	Rain on Cold-Soaked Wing ⁷	Other ⁸
-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	CAUTION: No holdover time guidelines exist
	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 -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.
- 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 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.
- 6 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 7 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 8 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 responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 19: GENERIC HOLDOVER TIMES FOR SAE TYPE IV FLUIDS

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ² , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold- Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:15 - 2:40	1:55 - 2:00	1:00 - 1:55	0:30 - 1:00	0:40 - 1:10	0:20 - 0:35	0:08 - 1:05	CAUTION: No holdover time guidelines exist
	75/25	1:25 - 2:40	2:00 - 2:00	1:15 - 2:00	0:40 - 1:15	0:50 - 1:20	0:30 - 0:45	0:09 - 1:15	
	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		
below -3 to -8°C (below 27 to 18°F)	100/0	0:20 - 1:35	1:45 - 2:00	0:55 - 1:45	0:25 - 0:55	0:25 - 1:10	0:20 - 0:25		
	75/25	0:30 - 1:20	1:50 - 2:00	1:00 - 1:50	0:30 - 1:00	0:20 - 1:05	0:15 - 0:25		
below -8 to -14°C (below 18 to 7°F)	100/0	0:20 - 1:35	1:20 - 1:40	0:45 - 1:20	0:25 - 0:45	0:25 - 1:10 ⁸	0:20 - 0:25 ⁸		
	75/25	0:30 - 1:20	1:40 - 2:00	0:45 - 1:40	0:20 - 0:45	0:20 - 1:05 ⁸	0:15 - 0:25 ⁸		
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 ⁹ (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 ⁹ (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 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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).
- 9 If the LOUT is unknown, no holdover time guidelines exist below -23.5°C (-10°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 20: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	3:20 - 4:00	2:00 - 2:00	1:55 - 2:00	1:00 - 1:55	1:25 - 2:00	1:00 - 1:25	0:10 - 1:55	CAUTION: No holdover time guidelines exist
	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	0:20 - 1:35	2:00 - 2:00	1:30 - 2:00	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	2:00 - 2:00	1:15 - 2:00	0:40 - 1:15	0:25 - 1:25 ⁸	0:20 - 0:25 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 21: TYPE IV HOLDOVER TIMES FOR ALL CLEAR CLEARWING ECO

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ² , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:00 - 4:00	2:00 - 2:00	1:45 - 2:00	0:50 - 1:45	1:50 - 2:00	1:20 - 1:40	0:20 - 2:00	CAUTION: No holdover time guidelines exist
	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 - 2:30	2:00 - 2:00	1:20 - 2:00	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	2:00 - 2:00	1:05 - 2:00	0:30 - 1:05	0:55 - 2:00 ⁸	0:45 - 1:15 ⁸		
	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 -20°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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 22: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:50 - 3:15	2:00 - 2:00	1:20 - 2:00	0:40 - 1:20	1:10 - 1:35	0:30 - 1:00	0:10 - 1:30	CAUTION: No holdover time guidelines exist
	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	1:35 - 3:45	2:00 - 2:00	1:10 - 2:00	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	2:00 - 2:00	1:05 - 2:00	0:30 - 1:05	1:05 - 1:30 ⁸	0:30 - 1:00 ⁸		
	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 - 2:00	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 23: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:35 - 3:15	2:00 - 2:00	1:00 - 2:00	0:30 - 1:00	0:40 - 1:10	0:20 - 0:35	0:08 - 1:05	CAUTION: No holdover time guidelines exist
	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	1:25 - 2:45	1:50 - 2:00	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 ⁸	0:20 - 0:35 ⁸		
	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	0:50 - 1:05	0:25 - 0:50	0:10 - 0:25				
below -18 to -25°C (below 0 to -13°F)	100/0	0:50 - 1:25	0:40 - 0:55	0:15 - 0:40	0:05 - 0:15				
below -25 to -30°C (below -13 to -22°F)	100/0	0:30 - 1:05	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 24: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:50 - 3:15	2:00 - 2:00	1:35 - 2:00	0:55 - 1:35	1:10 - 1:35	0:45 - 1:05	0:15 - 1:20	CAUTION: No holdover time guidelines exist
	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 - 1:55	2:00 - 2:00	1:10 - 2:00	0:40 - 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	1:35 - 1:55	0:55 - 1:35	0:30 - 0:55	0:55 - 1:10 ⁸	0:35 - 0:55 ⁸		
	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	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 - 0:45	0:10 - 0:20	0:03 - 0:10	0:01 - 0:03				
below -25 to -26°C (below -13 to -15°F)	100/0	0:30 - 0:45	0:05 - 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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 25: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:30 - 3:05	1:55 - 2:00	1:10 - 1:55	0:40 - 1:10	1:05 - 2:00	0:30 - 0:50	0:10 - 2:00	CAUTION: No holdover time guidelines exist
	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	1:20 - 3:00	1:45 - 2:00	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 ⁸	0:35 - 0:50 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 26: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:15 - 4:00	2:00 - 2:00	1:40 - 2:00	0:55 - 1:40	2:00 - 2:00	1:10 - 1:55	0:20 - 2:00	CAUTION: No holdover time guidelines exist
	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 - 2:10	2:00 - 2:00	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 ⁸	0:45 - 1:05 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 27: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:05 - 3:35	2:00 - 2:00	1:15 - 2:00	0:35 - 1:15	0:45 - 1:40	0:25 - 0:40	0:09 - 1:45	CAUTION: No holdover time guidelines exist
	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	1:25 - 3:40	2:00 - 2:00	1:15 - 2:00	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	2:00 - 2:00	1:15 - 2:00	0:35 - 1:15	1:00 - 1:35 ⁸	0:35 - 0:50 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 28: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:15 - 4:00	2:00 - 2:00	1:45 - 2:00	0:55 - 1:45	1:20 - 2:00	0:55 - 1:20	0:25 - 2:00	CAUTION: No holdover time guidelines exist
	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	1:50 - 4:00	2:00 - 2:00	1:45 - 2:00	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	2:00 - 2:00	1:45 - 2:00	0:55 - 1:45	1:15 - 2:00 ⁸	0:45 - 1:20 ⁸		
	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	2:00 - 2:00	1:35 - 2:00	0:50 - 1:35				
below -18 to -25°C (below 0 to -13°F)	100/0	0:40 - 1:30	2:00 - 2:00	1:05 - 2:00	0:35 - 1:05				
below -25 to -29°C (below -13 to -20°F)	100/0	0:40 - 1:30	1:50 - 2:00	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 29: TYPE IV HOLDOVER TIMES FOR CLARIANT MAX FLIGHT 04

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ² , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:40 - 4:00	2:00 - 2:00	2:00 - 2:00	1:25 - 2:00	2:00 - 2:00	1:10 - 1:30	0:20 - 2:00	CAUTION: No holdover time guidelines exist
	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	0:50 - 2:30	2:00 - 2:00	1:40 - 2:00	0:50 - 1:40	0:25 - 1:30	0:20 - 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	0:50 - 2:30	2:00 - 2:00	1:10 - 2:00	0:35 - 1:10	0:25 - 1:30 ⁸	0:20 - 0:40 ⁸		
	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 - 0:45	0:30 - 0:45	0:09 - 0:30	0:02 - 0:09				
below -18 to -23.5°C (below 0 to -10°F)	100/0	0:20 - 0:45	0:10 - 0:20	0:03 - 0:10	0:01 - 0:03				

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 30: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	3:05 - 4:00	2:00 - 2:00	1:45 - 2:00	1:00 - 1:45	1:25 - 2:00	0:55 - 1:10	0:09 - 2:00	CAUTION: No holdover time guidelines exist
	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	1:45 - 3:55	2:00 - 2:00	1:25 - 2:00	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	2:00 - 2:00	1:15 - 2:00	0:40 - 1:15	1:10 - 2:00 ⁸	0:55 - 1:30 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 31: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:25 - 4:00	2:00 - 2:00	1:40 - 2:00	0:55 - 1:40	2:00 - 2:00	0:50 - 1:40	0:20 - 1:30	CAUTION: No holdover time guidelines exist
	75/25	4:00 - 4:00	2:00 - 2:00	1:30 - 2:00	0:55 - 1:30	1:30 - 2:00	1:05 - 1:20	0:15 - 1:45	
	50/50	1:30 - 3:30	1:45 - 2:00	0:45 - 1:45	0:20 - 0:45	0:35 - 1:10	0:15 - 0:30		
below -3 to -8°C (below 27 to 18°F)	100/0	0:45 - 2:20	2:00 - 2:00	1:20 - 2:00	0:45 - 1:20	0:30 - 1:25	0:25 - 0:40		
	75/25	0:30 - 1:25	1:55 - 2:00	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	2:00 - 2:00	1:10 - 2:00	0:40 - 1:10	0:30 - 1:25 ⁸	0:25 - 0:40 ⁸		
	75/25	0:30 - 1:25	1:40 - 2:00	1:00 - 1:40	0:40 - 1:00	0:20 - 1:05 ⁸	0:20 - 0:40 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 32: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:20 - 3:55	2:00 - 2:00	1:40 - 2:00	0:50 - 1:40	1:30 - 2:00	0:50 - 0:55	0:08 - 2:00	CAUTION: No holdover time guidelines exist
	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	1:45 - 4:00	2:00 - 2:00	1:30 - 2:00	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	2:00 - 2:00	1:30 - 2:00	0:50 - 1:30	1:05 - 1:50 ⁸	0:55 - 1:25 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 33: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	4:00 - 4:00	2:00 - 2:00	1:45 - 2:00	1:05 - 1:45	1:30 - 2:00	1:00 - 1:40	0:15 - 1:40	CAUTION: No holdover time guidelines exist
	75/25	3:40 - 4:00	2:00 - 2:00	1:45 - 2:00	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		
below -3 to -8°C (below 27 to 18°F)	100/0	1:00 - 1:55	2:00 - 2:00	1:30 - 2:00	0:55 - 1:30	0:35 - 1:40	0:25 - 0:45		
	75/25	0:40 - 1:20	2:00 - 2:00	1:30 - 2:00	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	2:00 - 2:00	1:20 - 2:00	0:50 - 1:20	0:35 - 1:40 ⁸	0:25 - 0:45 ⁸		
	75/25	0:40 - 1:20	2:00 - 2:00	1:25 - 2:00	0:45 - 1:25	0:25 - 1:10 ⁸	0:25 - 0:45 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 34: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	3:55 - 4:00	2:00 - 2:00	2:00 - 2:00	0:55 - 2:00	2:00 - 2:00	1:00 - 2:00	0:20 - 2:00	CAUTION: No holdover time guidelines exist
	75/25	3:55 - 4:00	2:00 - 2:00	1:55 - 2:00	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		
below -3 to -8°C (below 27 to 18°F)	100/0	0:55 - 2:15	2:00 - 2:00	1:40 - 2:00	0:45 - 1:40	0:25 - 1:35	0:25 - 0:40		
	75/25	0:40 - 2:00	2:00 - 2:00	1:30 - 2:00	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	2:00 - 2:00	1:25 - 2:00	0:40 - 1:25	0:25 - 1:35 ⁸	0:25 - 0:40 ⁸		
	75/25	0:40 - 2:00	2:00 - 2:00	1:15 - 2:00	0:30 - 1:15	0:20 - 1:05 ⁸	0:20 - 0:30 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 35: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:50 - 4:00	2:00 - 2:00	1:55 - 2:00	1:05 - 1:55	1:35 - 2:00	1:15 - 1:30	0:15 - 2:00	CAUTION: No holdover time guidelines exist
	75/25	2:30 - 4:00	2:00 - 2:00	1:25 - 2:00	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		
below -3 to -8°C (below 27 to 18°F)	100/0	0:55 - 2:30	2:00 - 2:00	1:25 - 2:00	0:50 - 1:25	0:35 - 1:35	0:35 - 0:45		
	75/25	0:40 - 1:30	2:00 - 2:00	1:05 - 2:00	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 - 2:00	1:10 - 2:00	0:40 - 1:10	0:35 - 1:35 ⁸	0:35 - 0:45 ⁸		
	75/25	0:40 - 1:30	2:00 - 2:00	0:55 - 2:00	0:25 - 0:55	0:25 - 1:05 ⁸	0:35 - 0:45 ⁸		
below -14 to -18°C (below 7 to 0°F)	100/0	0:25 - 0:50	1:35 - 2:00	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 36: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:30 - 4:00	2:00 - 2:00	2:00 - 2:00	1:05 - 2:00	2:00 - 2:00	1:00 - 1:50	0:20 - 1:45	CAUTION: No holdover time guidelines exist
	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	2:00 - 2:00	1:35 - 2:00	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	2:00 - 2:00	1:20 - 2:00	0:45 - 1:20	0:35 - 1:40 ⁸	0:50 - 0:55 ⁸		
	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				

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 37: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:05 - 3:10	2:00 - 2:00	1:20 - 2:00	0:40 - 1:20	1:10 - 2:00	0:50 - 1:15	0:20 - 2:00	CAUTION: No holdover time guidelines exist
	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	1:50 - 3:20	2:00 - 2:00	1:10 - 2:00	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	2:00 - 2:00	1:05 - 2:00	0:30 - 1:05	0:55 - 1:50 ⁸	0:45 - 1:10 ⁸		
	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 - 2:00	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 38: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	3:20 - 4:00	2:00 - 2:00	1:55 - 2:00	1:00 - 1:55	1:25 - 2:00	1:00 - 1:25	0:10 - 1:55	CAUTION: No holdover time guidelines exist
	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	0:20 - 1:35	2:00 - 2:00	1:30 - 2:00	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	2:00 - 2:00	1:15 - 2:00	0:40 - 1:15	0:25 - 1:25 ⁸	0:20 - 0:25 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 39: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:15 - 2:40	2:00 - 2:00	1:20 - 2:00	0:45 - 1:20	0:40 - 1:30	0:35 - 0:40	0:15 - 1:35	CAUTION: No holdover time guidelines exist
	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	2:00 - 2:00	1:10 - 2:00	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 - 2:00	1:05 - 1:55	0:35 - 1:05	0:50 - 1:25 ⁸	0:30 - 0:40 ⁸		
	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				

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 40: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:30 - 2:40	2:00 - 2:00	1:15 - 2:00	0:35 - 1:15	1:05 - 1:30	0:40 - 1:05	0:15 - 1:10	CAUTION: No holdover time guidelines exist
	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	0:55 - 2:35	2:00 - 2:00	1:05 - 2:00	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	2:00 - 2:00	1:00 - 2:00	0:30 - 1:00	0:50 - 1:20 ⁸	0:35 - 0:50 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

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

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ² , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:45 - 4:00	2:00 - 2:00	2:00 - 2:00	1:25 - 2:00	2:00 - 2:00	1:00 - 1:45	0:20 - 2:00	CAUTION: No holdover time guidelines exist
	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	2:20 - 4:00	2:00 - 2:00	2:00 - 2:00	1:15 - 2:00	1:00 - 2:00	1:20 - 1:50		
	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	2:20 - 4:00	2:00 - 2:00	1:55 - 2:00	1:10 - 1:55	1:00 - 2:00 ⁸	1:20 - 1:50 ⁸		
	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 - 2:25	0:50 - 1:05	0:25 - 0:50	0:10 - 0:25				
below -18 to -25°C (below 0 to -13°F)	100/0	0:45 - 2:25	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 - 2:25	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:10 - 4:00	2:00 - 2:00	1:25 - 2:00	0:40 - 1:25	1:05 - 2:00	0:30 - 0:50	0:09 - 1:55	CAUTION: No holdover time guidelines exist
	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	2:40 - 4:00	2:00 - 2:00	1:25 - 2:00	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	2:00 - 2:00	1:25 - 2:00	0:40 - 1:25	1:05 - 2:00 ⁸	0:40 - 1:00 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold- Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:10 - 4:00	2:00 - 2:00	2:00 - 2:00	1:15 - 2:00	1:50 - 2:00	1:05 - 2:00	0:25 - 2:00	CAUTION: No holdover time guidelines exist
	75/25	1:25 - 2:40	2:00 - 2:00	1:15 - 2:00	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		
below -3 to -8°C (below 27 to 18°F)	100/0	0:55 - 3:30	2:00 - 2:00	1:50 - 2:00	1:05 - 1:50	0:25 - 1:35	0:20 - 0:30		
	75/25	0:45 - 1:50	1:50 - 2:00	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	2:00 - 2:00	1:45 - 2:00	1:00 - 1:45	0:25 - 1:35 ⁸	0:20 - 0:30 ⁸		
	75/25	0:45 - 1:50	1:45 - 2:00	1:00 - 1:45	0:35 - 1:00	0:20 - 1:10 ⁸	0:15 - 0:25 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:55 - 4:00	2:00 - 2:00	1:10 - 2:00	0:35 - 1:10	1:10 - 2:00	0:40 - 1:05	0:15 - 1:25	CAUTION: No holdover time guidelines exist
	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	0:35 - 2:05	1:50 - 2:00	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 ⁸	0:20 - 0:35 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:35 - 4:00	2:00 - 2:00	1:10 - 2:00	0:35 - 1:10	1:20 - 2:00	0:40 - 1:05	0:15 - 2:00	CAUTION: No holdover time guidelines exist
	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	1:25 - 3:25	2:00 - 2:00	1:00 - 2:00	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 - 2:00	0:50 - 1:55	0:25 - 0:50	0:50 - 2:00 ⁸	0:45 - 1:05 ⁸		
	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 - 2:00	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 -21°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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE 46: TYPE IV HOLDOVER TIMES FOR SHAANXI CLEANWAY AVIATION CLEANSURFACE IV

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ² , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold- Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:50 - 4:00	2:00 - 2:00	1:55 - 2:00	1:00 - 1:55	2:00 - 2:00	1:25 - 1:30	0:15 - 2:00	CAUTION: No holdover time guidelines exist
	75/25	2:35 - 4:00	2:00 - 2:00	1:35 - 2:00	0:45 - 1:35	0:50 - 2:00	0:35 - 0:45	0:09 - 1:15	
	50/50	1:05 - 2:25	1:40 - 2:00	0:40 - 1:40	0:15 - 0:40	0:25 - 0:50	0:15 - 0:20		
below -3 to -8°C (below 27 to 18°F)	100/0	1:00 - 3:05	2:00 - 2:00	1:05 - 2:00	0:35 - 1:05	0:35 - 1:45	0:20 - 0:35		
	75/25	0:50 - 1:55	2:00 - 2:00	1:00 - 2:00	0:30 - 1:00	0:30 - 1:20	0:25 - 0:40		
below -8 to -14°C (below 18 to 7°F)	100/0	1:00 - 3:05	1:20 - 1:40	0:45 - 1:20	0:25 - 0:45	0:35 - 1:45 ⁸	0:20 - 0:35 ⁸		
	75/25	0:50 - 1:55	1:40 - 2:00	0:45 - 1:40	0:20 - 0:45	0:30 - 1:20 ⁸	0:25 - 0:40 ⁸		
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 -28.5°C (below -13 to -19°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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

ALLOWANCE TIMES TABLES FOR WINTER 2021-2022

TABLE 47: ALLOWANCE TIMES FOR SAE TYPE III FLUIDS¹

Precipitation Types or Combinations	Applicable METAR Codes	Outside Air Temperature		
		-5 °C and above	Below -5 to -10 °C	Below -10 °C ²
Light Ice Pellets	-PL	10 minutes	10 minutes	Caution: No allowance times currently exist
Light Ice Pellets Mixed with Light Snow	-PLSN, -SNPL	10 minutes	10 minutes	
Light Ice Pellets Mixed with Light Freezing Drizzle or Moderate Freezing Drizzle	-PLFZDZ, -FZDZPL, FZDZPL	7 minutes	5 minutes	
Light Ice Pellets Mixed with Light Freezing Rain	-PLFZRA, -FZRAPL	7 minutes	5 minutes	
Light Ice Pellets Mixed with Light Rain	-PLRA, -RAPL	7 minutes ³		
Moderate Ice Pellets (or Small Hail ⁴)	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 Ensure that the lowest operational use temperature (LOUT) is respected.
- 3 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.
- 4 In Canada (and outside the US) the code GS is used when hail is less than 5 mm and GR when it is 5mm or greater. In the US, small hail is included with regular hail and the remarks section is used saying "GR LESS THAN ¼". If no intensity is reported with small hail, use the "moderate ice pellets or small hail" allowance times. If an intensity is reported 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 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.
- Allowance time cannot be extended by an inspection of the aircraft critical surfaces.
- 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.

**TABLE 48: ALLOWANCE TIMES FOR SAE TYPE IV
ETHYLENE GLYCOL (EG) FLUIDS¹**

Precipitation Types or Combinations	Applicable METAR Codes	Outside Air Temperature			
		-5 °C and above	Below -5 to -10 °C	Below -10 to -16 °C	Below -16 to -22 °C ²
Light Ice Pellets	-PL	70 minutes	50 minutes	30 minutes	30 minutes
Light Ice Pellets Mixed with Light Snow	-PLSN, -SNPL	50 minutes	30 minutes	15 minutes	Caution: No allowance times currently exist
Light Ice Pellets Mixed with Light Freezing Drizzle or Moderate Freezing Drizzle	-PLFZDZ, -FZDZPL, FZDZPL	40 minutes	30 minutes		
Light Ice Pellets Mixed with Light Freezing Rain	-PLFZRA, -FZRAPL	40 minutes	30 minutes		
Light Ice Pellets Mixed with Light Rain	-PLRA, -RAPL	40 minutes ³			
Moderate Ice Pellets (or Small Hail ⁴)	PL, GS	35 minutes	25 minutes	10 minutes	10 minutes
Moderate Ice Pellets (or Small Hail ⁴) Mixed with Moderate Freezing Drizzle	PLFZDZ, GSFZDZ,	20 minutes	10 minutes		Caution: No allowance times currently exist
Moderate Ice Pellets (or Small Hail ⁴) Mixed with Moderate Rain	PLRA, GSRA, RAPL, RAGS	15 minutes ⁵			

NOTES

- 1 These allowance times are for use with undiluted (100/0) ethylene glycol based fluids applied on aircraft with rotation speeds of 100 knots or greater. The following fluids are ethylene glycol based; 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 EG 4, 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 Ensure that the lowest operational use temperature (LOUT) is respected.
- 3 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.
- 4 In Canada (and outside the US) the code GS is used when hail is less than 5 mm and GR when it is 5mm or greater. In the US, small hail is included with regular hail and the remarks section is used saying "GR LESS THAN ¼". If no intensity is reported with small hail, use the "moderate ice pellets or small hail" allowance times. If an intensity is reported 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.
- 5 No allowance times exist in this condition for temperatures of 0 °C and below.

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.
- Allowance time cannot be extended by an inspection of the aircraft critical surfaces.
- 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.

**TABLE 49: ALLOWANCE TIMES FOR SAE TYPE IV
PROPYLENE GLYCOL (PG) FLUIDS¹**

Precipitation Types or Combinations	Applicable METAR Codes	Outside Air Temperature			
		-5 °C and above	Below -5 to -10 °C	Below -10 to -16 °C	Below -16 to -22 °C ²
Light Ice Pellets	-PL	50 minutes	30 minutes	30 minutes ³	30 minutes ³
Light Ice Pellets Mixed with Light Snow	-PLSN, -SNPL	40 minutes	15 minutes	15 minutes ³	Caution: No allowance times currently exist
Light Ice Pellets Mixed with Light Freezing Drizzle or Moderate Freezing Drizzle	-PLFZDZ, -FZDZPL, FZDZPL	25 minutes	10 minutes		
Light Ice Pellets Mixed with Light Freezing Rain	-PLFZRA, -FZRAPL	25 minutes	10 minutes		
Light Ice Pellets Mixed with Light Rain	-PLRA, -RAPL	25 minutes ⁴			
Moderate Ice Pellets (or Small Hail ⁵)	PL, GS	15 minutes	10 minutes	10 minutes ³	
Moderate Ice Pellets (or Small Hail ⁵) Mixed with Moderate Freezing Drizzle	PLFZDZ, GSFZDZ	10 minutes	7 minutes		Caution: No allowance times currently exist
Moderate Ice Pellets (or Small Hail ⁵) Mixed with Moderate Rain	PLRA, GSRA, RAPL, RAGS	10 minutes ⁶			

NOTES

- 1 These allowance times are for use with undiluted (100/0) propylene glycol based fluids applied on aircraft with rotation speeds of 100 knots or greater. All Type IV fluids are propylene glycol based with the exception of 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 EG 4, JSC RCP Nordix Defrost NORTH 4, and Newave Aerochemical FCY-EGIV, which are ethylene glycol based. If the glycol type is unknown, the allowance times for SAE Type IV PG fluids should be used.
- 2 Ensure that the lowest operational use temperature (LOUT) is respected.
- 3 No allowance times exist for propylene glycol (PG) fluids when used on aircraft with rotation speeds less than 115 knots.
- 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 rain.
- 5 In Canada (and outside the US) the code GS is used when hail is less than 5 mm and GR when it is 5mm or greater. In the US, small hail is included with regular hail and the remarks section is used saying "GR LESS THAN ¼". If no intensity is reported with small hail, use the "moderate ice pellets or small hail" allowance times. If an intensity is reported 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.
- 6 No allowance times exist in this condition for temperatures of 0 °C and below.

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.
- Allowance time cannot be extended by an inspection of the aircraft critical surfaces.
- 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.

SUPPLEMENTAL GUIDANCE FOR WINTER 2021-2022

TABLE 50: SNOWFALL INTENSITIES AS A FUNCTION OF PREVAILING VISIBILITY¹

Lighting	Temperature Range		Visibility in Snow in Statute Miles (Metres)			
	°C	°F	Heavy	Moderate	Light	Very Light
Darkness	-1 and above	30 and above	≤1 (≤1600)	>1 to 2½ (>1600 to 4000)	>2½ to 4 (>4000 to 6400)	>4 (>6400)
	Below -1	Below 30	≤¾ (≤1200)	>¾ to 1½ (>1200 to 2400)	>1½ to 3 (>2400 to 4800)	>3 (>4800)
Daylight	-1 and above	30 and above	≤½ (≤800)	>½ to 1½ (>800 to 2400)	>1½ to 3 (>2400 to 4800)	>3 (>4800)
	Below -1	Below 30	≤¾ (≤600)	>¾ to 7/8 (>600 to 1400)	>7/8 to 2 (>1400 to 3200)	>2 (>3200)

NOTES

1 Based on: *Relationship between Visibility and Snowfall Intensity* (TP 14151E), Transportation Development Centre, Transport Canada, November 2003; and *Theoretical Considerations in the Estimation of Snowfall Rate Using Visibility* (TP 12893E), Transportation Development Centre, Transport Canada, November 1998.

HOW TO READ AND USE THE TABLE

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 in the METAR/SPECI.

RVR values should not be used with this table.

Example: *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 Transport Canada “Snowfall Intensities as a Function of Prevailing Visibility” table, with a visibility of 1 statute mile, in darkness 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 page 70 and 71)

COMPANY NAME	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		HIGH SPEED AERODYNAMIC TEST ⁶	
					°C	°F	°C	°F
ABAX Industries	DE-950	PG	22-04-25	71/29	-26	-15	-31	-24
ADDCON EUROPE GmbH	IceFree I.80	PG	21-03-14 ⁹	70/30	-26	-15	-32	-26
ALAB Industries ¹⁰	WDF 1	EG	22-03-02	70/30	-40	-40	-45	-49
AllClear Systems LLC	Lift-Off E-188	EG	22-05-15	70/30	-40	-40	-41.5	-43
AllClear Systems LLC	Lift-Off P-88	PG	22-05-15	70/30	-24.5	-12	-29.5	-21
Arcton Ltd. ¹⁰	Arctica DG ready-to-use	DEG	22-03-26	as supplied	-26	-15	-26	-15
ASGlobal	Sky-Go EG	EG	22-05-27	70/30	-31	-24	-40	-40
ASGlobal	Sky-Go PG	PG	22-02-17	70/30	-21.5	-7	-30.5	-23
AVIAFLUID International Ltd.	AVIAFLO EG	EG	21-06-19 ¹²	70/30	-40.5	-41	-44	-47
AVIAFLUID International Ltd.	AVIAFLO PG	PG	22-02-10	70/30	Not tested ¹¹	Not tested ¹¹	-30	-22
Aviation Shaanxi Hi-Tech Physical Chemical Co. Ltd.	Cleanwing I	PG	23-05-14	75/25	Not tested ¹¹	Not tested ¹¹	-39.5	-39
Aviation Xi'an High-Tech Physical Chemical Co. Ltd.	Cleanwing E	EG	22-07-09	75/25	Not tested ¹¹	Not tested ¹¹	-37	-35
Aviation Xi'an High-Tech Physical Chemical Co. Ltd.	Cleanwing S-92	EG	22-06-03	75/25	Not tested ¹¹	Not tested ¹¹	-40	-40
Aviation Xi'an High-Tech Physical Chemical Co. Ltd.	KHF-1	PG	23-05-24	75/25	Not tested ¹¹	Not tested ¹¹	-38.5	-37
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
Beijing Wangye Aviation Chemical Product Co Ltd. ¹⁰	KLA-1A	EG	22-05-22	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
Beijing Yadilite Aviation Advanced Materials Corporation	YD-101A Type I	EG	25-02-26	70/30	Not tested ¹¹	Not tested ¹¹	-38	-36
Boryszew S.A.	Borygo Plane I	PG	17-12-04 ⁹	75/25	-25	-13	-30	-22
CHEMCO Inc.	CHEMR EG I	EG	24-04-17	70/30	-37	-35	-43	-45
CHEMCO Inc.	CHEMR REG I	EG	22-05-25	75/25	-36.5	-34	-43.5	-46
Clariant Produkte (Deutschland) GmbH	Octaflo EF Concentrate	PG	22-03-28	65/35	-25	-13	-33	-27
Clariant Produkte (Deutschland) GmbH	Octaflo EG Concentrate	EG	17-07-23 ⁹	70/30	-40.5	-41	-44	-47
Clariant Produkte (Deutschland) GmbH	Octaflo LYOD	EG	20-03-16 ¹²	70/30	-40	-40	-45.5	-50

TABLE 51 (CONT'D):
TYPE I FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE
 (see cautions and notes on page 70 and 71)

COMPANY NAME	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		HIGH SPEED AERODYNAMIC TEST ⁶	
					°C	°F	°C	°F
Clariant Produkte (Deutschland) GmbH	Safewing EG I 1996 (88)	EG	23-11-19	70/30	-39.5	-39	-41.5	-43
Clariant Produkte (Deutschland) GmbH	Safewing MP I 1938 ECO	PG	24-07-02	65/35	-25.5	-14	-32	-26
Clariant Produkte (Deutschland) GmbH	Safewing MP I 1938 ECO (80)	PG	24-06-23	71/29	-25	-13	-32.5	-27
Clariant Produkte (Deutschland) GmbH	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
Clariant Produkte (Deutschland) GmbH	Safewing MP I ECO PLUS (80)	PG	23-04-12	71/29	-25	-13	-33	-27
Clariant Produkte (Deutschland) GmbH	Safewing MP I LFD 80	PG	25-04-15	71/29	-26	-15	-33	-27
Clariant Produkte (Deutschland) GmbH	Safewing MP I LFD 88	PG	23-06-12	65/35	-26	-15	-33	-27
Cryotech Deicing Technology	Polar Plus®	PG	20-01-13 ⁹	63/37	-27	-17	-32	-26
Cryotech Deicing Technology	Polar Plus® LT	PG	24-01-21	63/37	-27	-17	-33	-27
Cryotech Deicing Technology	Polar Plus® LT (80)	PG	24-06-15	70/30	-27	-17	-33	-27
Cryotech Deicing Technology	Polar Plus® (80)	PG	17-09-12 ⁹	70/30	-24.5	-12	-32.5	-27
Dow Chemical Company	UCAR™ ADF Concentrate	EG	23-03-26	75/25	-36	-33	-45	-49
Dow Chemical Company	UCAR™ ADF XL54 ¹³	EG	23-03-26	as supplied	-33	-27	-33	-27
Dow Chemical Company	UCAR™ PG ADF Concentrate	PG	23-04-16	65/35	-25	-13	-32	-26
Dow Chemical Company	UCAR™ PG ADF Dilute 55/45 ¹⁴	PG	23-04-16	as supplied	-24	-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	-29	-20
Inland Technologies	DuraGly-E Type I ADF Concentrate	EG	23-02-08	60/40	-33	-27	-33	-27
Inland Technologies	Inland ADF Concentrate (Multiple Location)	EG	Y-M-D ¹⁵	75/25	-36	-33	-42.5	-45
Inland Technologies	SafeTemp® ES Plus (Multiple Location)	PG	Y-M-D ¹⁶	65/35	-25.5	-14	-31	-24
JSC RCP Nordix	DEFROST EG 88.1	EG	21-04-25 ¹²	70/30	-40.5	-41	-44.5	-48
JSC RCP Nordix	DEFROST PG 1	PG	23-11-21	70/30	-24.5	-12	-31.5	-25
Kilfrost Limited	Kilfrost DF Plus	PG	23-06-18	69/31	-25.5	-14	-32	-26

TABLE 51 (CONT'D):
TYPE I FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE
 (see cautions and notes on page 70 and 71)

COMPANY NAME	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		HIGH SPEED AERODYNAMIC TEST ⁶	
					°C	°F	°C	°F
Kilfrost Limited	Kilfrost DF Plus (80)	PG	24-07-14	69/31	-26	-15	-31.5	-25
Kilfrost Limited	Kilfrost DF Plus (88)	PG	23-06-05	63/37	-25.5	-14	-32	-26
<i>Kilfrost Limited</i>	<i>Kilfrost DF^{Sustain}</i>	<i>NCG</i>	<i>19-08-06⁹</i>	<i>68/32</i>	<i>-34</i>	<i>-29</i>	<i>-41</i>	<i>-42</i>
Kilfrost Limited	Kilfrost Ice Clear I	PG	23-04-20	70/30	-26	-15	-33	-27
LNT Solutions ¹⁰	LNT E188	EG	21-08-22	70/30	-30.5	-23	-41	-42
LNT Solutions ¹⁰	LNT P180	PG	22-11-02	69/31	-26	-15	-32	-26
<i>LNT Solutions¹⁰</i>	<i>LNT P188</i>	<i>PG</i>	<i>18-11-28⁹</i>	<i>70/30</i>	<i>-24.5</i>	<i>-12</i>	<i>-31.5</i>	<i>-25</i>
MKS DEVO KIMYA SANAYI TIC AS.	COREICEPHOB TYPE I	PG	22-10-16	71/29	Not tested ¹¹	Not tested ¹¹	-32.5	-27
Newave Aerochemical Co. Ltd.	FCY-1A	EG	23-04-08	75/25	-40	-40	-40	-40
Newave Aerochemical Co. Ltd.	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	22-03-03	60/40	Not tested ¹¹	Not tested ¹¹	-22	-8
ROMCHIM PROTECT SRL	ADD-PROTECT Type I	PG	24-12-17	70/30	-25.5	-14	-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
Shaanxi Cleanway Aviation Chemical Co., Ltd	Cleansurface I-BIO	EG	22-05-02	75/25	Not tested ¹¹	Not tested ¹¹	-37	-35
Xinjiang Zhongtian Liyang Chemical Technology Co., Ltd ¹⁰	Clearice-I	EG	23-10-24	60/40	Not tested ¹¹	Not tested ¹¹	-30	-22

TABLE 52:
TYPE II FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE
 (see cautions and notes on page 70 and 71)

COMPANY NAME	FLUID NAME	TYPE OF GLYCOL ¹	EXPIRY ² (Y-M-D)	DILUTION (FLUID/WATER)	LOWEST OPERATIONAL USE TEMPERATURE ³		LOWEST ON-WING VISCOSITY ^{7,8} (mPa.s)	
					HIGH SPEED AERODYNAMIC TEST ⁶		MANUFACTURER METHOD	AS 9968 METHOD
					°C	°F		
ABAX Industries	ECOWING AD-2	PG	23-03-29	100/0	-27	-17	5 750 (a)	5 750 (a)
				75/25	-15	5	12 000 (c)	12 000 (c)
				50/50	-3	27	7 500 (a)	7 500 (a)
Aviation Shaanxi Hi-Tech Physical Chemical Co. Ltd.	Cleanwing II	PG	23-06-01	100/0	-25	-13	4 650 (d)	4 500 (a)
				75/25	-15	5	9 450 (d)	10 000 (a)
				50/50	-4.5	24	10 150 (d)	10 200 (a)
Beijing Yadilite Aviation Advanced Materials Corporation	YD-102 Type II	PG	18-02-26 ⁹	100/0	-29	-20	4 500 (a)	4 500 (a)
				75/25	-14	7	12 850 (a)	12 850 (a)
				50/50	-3	27	820 (a)	300 (m)
Clariant Produkte (Deutschland) GmbH	Safewing MP II FLIGHT	PG	22-03-06	100/0	-29	-20	3 340 (a)	3 340 (a)
				75/25	-14	7	12 900 (c)	12 900 (c)
				50/50	-3.5	26	11 500 (a)	11 500 (a)
Clariant Produkte (Deutschland) GmbH	Safewing MP II FLIGHT PLUS	PG	20-02-26 ⁹	100/0	-29	-20	3 650 (n)	3 100 (a)
				75/25	-14.5	6	12 400 (n)	10 450 (a)
				50/50	-4	25	7 800 (n)	7 050 (a)
Cryotech Deicing Technology	Polar Guard® II	PG	23-04-09	100/0	-30.5	-23	4 400 (e)	4 050 (a)
				75/25	-14	7	11 600 (e)	9 750 (a)
				50/50	-3.5	26	80 (a)	80 (a)
JSC RCP Nordix	Defrost PG 2	PG	20-06-27 ⁹	100/0	-27	-17	4 450 (a)	4 450 (a)
				75/25	-16	3	8 000 (a)	8 000 (a)
				50/50	-4	25	17 900 (g)	25 400 (c)
Kilfroast Limited	ABC-K Plus	PG	23-02-15	100/0	-29	-20	2 850 (d)	2 640 (a)
				75/25	-14.5	6	12 650 (d)	12 650 (c)
				50/50	-3.5	26	4 200 (d)	5 260 (a)
Newave Aerochemical Co. Ltd.	FCY-2	PG	23-07-08	100/0	-28	-18	7 000 (d)	8 920 (a)
				75/25	-14.5	6	18 550 (d)	18 550 (c)
				50/50	-4.5	24	6 750 (d)	7 030 (a)
Newave Aerochemical Co. Ltd.	FCY-2 Bio+	PG	19-04-10 ⁹	100/0	-28.5	-19	7 210 (a)	7 210 (a)
				75/25	-14	7	21 400 (c)	21 400 (c)
				50/50	-3	27	1 900 (a)	1 900 (a)

TABLE 52 (CONT'D):
TYPE II FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE
 (see cautions and notes on page 70 and 71)

COMPANY NAME	FLUID NAME	TYPE OF GLYCOL ¹	EXPIRY ² (Y-M-D)	DILUTION (FLUID/WATER)	LOWEST OPERATIONAL USE TEMPERATURE ³		LOWEST ON-WING VISCOSITY ^{7,8} (mPa.s)	
					HIGH SPEED AERODYNAMIC TEST ⁶		MANUFACTURER METHOD	AS 9968 METHOD
					°C	°F		
ROMCHIM PROTECT SRL	ADD-PROTECT NG Type II	PG	22-01-29	100/0	-28	-18	5 200 (a)	5 200 (a)
				75/25	-14.5	6	8 250 (a)	8 250 (a)
				50/50	-3	27	5 850 (a)	5 850 (a)
ROMCHIM PROTECT SRL	ADD-PROTECT Type II	PG	22-11-30	100/0	-28	-18	4 000 (a)	4 000 (a)
				75/25	-14	7	7 700 (a)	7 700 (a)
				50/50	-3	27	14 500 (a)	14 500 (a)

TABLE 53:
TYPE III FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE
 (see cautions and notes on page 70 and 71)

COMPANY NAME	FLUID NAME	TYPE OF GLYCOL ¹	EXPIRY ² (Y-M-D)	DILUTION (FLUID/WATER)	LOWEST OPERATIONAL USE TEMPERATURE ³				LOWEST ON-WING VISCOSITY ^{7,8} (mPa.s)	
					LOW SPEED AERODYNAMIC TEST ⁶		HIGH SPEED AERODYNAMIC TEST ⁶		MANUFACTURER METHOD	AS 9968 METHOD
					°C	°F	°C	°F		
AllClear Systems LLC	AeroClear MAX	EG	23-03-23	100/0	-16	3	-35	-31	7 800 (l)	Not Available ¹⁷
				75/25	Dilution Not Applicable		Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable		Dilution Not Applicable	

TABLE 54:
TYPE IV FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE
 (see cautions and notes on page 70 and 71)

COMPANY NAME	FLUID NAME	TYPE OF GLYCOL ¹	EXPIRY ² (Y-M-D)	DILUTION (FLUID/WATER)	LOWEST OPERATIONAL USE TEMPERATURE ³		LOWEST ON-WING VISCOSITY ^{7,8} (mPa.s)	
					HIGH SPEED AERODYNAMIC TEST ⁶		MANUFACTURER METHOD	AS 9968 METHOD
					°C	°F		
ABAX Industries	ECOWING AD-49	PG	22-05-28	100/0	-26	-15	12 150 (g)	11 000 (a)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
AllClear Systems LLC	ClearWing ECO	PG	23-03-29	100/0	-26	-15	37 600 (i)	42 000 (c)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
AllClear Systems LLC	ClearWing EG	EG	23-03-17	100/0	-29	-20	35 500 (k)	13 350 (a)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
ASGlobal	4Flite EG	EG	22-04-28	100/0	-30	-22	6 600 (a)	6 600 (a)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
ASGlobal	4Flite PG	PG	23-06-29	100/0	-26	-15	26 100 (c)	26 100 (c)
				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	100/0	-31	-24	5 600 (a)	5 600 (a)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
AVIAFLUID International Ltd.	AVIAFlight PG	PG	23-07-01	100/0	-25.5	-14	28 600 (c)	28 600 (c)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
CHEMCO Inc.	ChemR EG IV	EG	23-04-07	100/0	-27	-17	46 400 (j)	19 450 (c)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
CHEMCO Inc.	ChemR Nordik IV	EG	23-05-17	100/0	-29	-20	60 800 (k)	43 100 (c)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
Clariant Produkte (Deutschland) GmbH	Max Flight 04	PG	19-01-09 ⁹	100/0	-23.5	-10	5 540 (b)	5 540 (a)
				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 page 70 and 71)

COMPANY NAME	FLUID NAME	TYPE OF GLYCOL ¹	EXPIRY ² (Y-M-D)	DILUTION (FLUID/WATER)	LOWEST OPERATIONAL USE TEMPERATURE ³		LOWEST ON-WING VISCOSITY ^{7,8} (mPa.s)	
					HIGH SPEED AERODYNAMIC TEST ⁶		MANUFACTURER METHOD	AS 9968 METHOD
					°C	°F		
Clariant Produkte (Deutschland) GmbH	Max Flight AVIA	EG	22-12-18	100/0	-28.5	-19	1 000 (m)	1 000 (m)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
Clariant Produkte (Deutschland) GmbH	Max Flight SNEG	PG	22-06-09	100/0	-29	-20	8 700 (o)	8 050 (a)
				75/25	-14	7	20 200 (p)	21 800 (c)
				50/50	-3	27	13 600(p)	15 000 (c)
Clariant Produkte (Deutschland) GmbH	Safewing EG IV NORTH	EG	22-11-18	100/0	-30	-22	830 (m)	830 (m)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
Clariant Produkte (Deutschland) GmbH	Safewing MP IV LAUNCH	PG	22-03-12	100/0	-28.5	-19	7 550 (a)	7 550 (a)
				75/25	-14	7	18 000 (a)	18 000 (a)
				50/50	-3.5	26	17 800 (a)	17 800 (a)
Clariant Produkte (Deutschland) GmbH	Safewing MP IV LAUNCH PLUS	PG	23-03-12	100/0	-29	-20	8 700 (o)	8 450 (a)
				75/25	-14	7	18 800 (p)	17 200 (c)
				50/50	-3.5	26	9 700 (o)	12 150 (a)
Cryotech Deicing Technology	Polar Guard® Advance	PG	23-04-07	100/0	-30.5	-23	4 400 (e)	4 050 (a)
				75/25	-14	7	11 600 (e)	9 750 (a)
				50/50	-3.5	26	80 (a)	80 (a)
Cryotech Deicing Technology	Polar Guard® Xtend	PG	23-04-13	100/0	-29	-20	6 000 (e)	6 350 (a)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
Dow Chemical Company	UCAR™ Endurance EG106 De/Anti-Icing Fluid	EG	23-03-21	100/0	-29	-20	24 850 (h)	2 230 (a)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
Dow Chemical Company	UCAR™ FlightGuard AD-49	PG	23-05-27	100/0	-26	-15	12 150 (g)	11 000 (a)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
Inland Technologies	ECO-SHIELD®	PG	20-08-16 ¹²	100/0	-25.5	-14	11 050 (a)	11 050 (a)
				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 page 68 and 69)

COMPANY NAME	FLUID NAME	TYPE OF GLYCOL ¹	EXPIRY ² (Y-M-D)	DILUTION (FLUID/WATER)	LOWEST OPERATIONAL USE TEMPERATURE ³		LOWEST ON-WING VISCOSITY ^{7,8} (mPa.s)	
					HIGH SPEED AERODYNAMIC TEST ⁶		MANUFACTURER METHOD	AS 9968 METHOD
					°C	°F		
JSC RCP Nordix	Defrost ECO 4	PG	22-06-08 ¹⁸	100/0	-25.5	-14	9 800 (g)	12 350 (a)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
JSC RCP Nordix	Defrost EG 4	EG	22-08-26	100/0	-26	-15	12 000 (g)	12 950 (a)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
JSC RCP Nordix	Defrost NORTH 4	EG	23-06-01	100/0	-26	-15	2 500 (a)	2 500 (a)
				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	100/0	-28	-18	17 900 (d)	17 900 (c)
				75/25	-14.5	6	18 300 (d)	18 300 (c)
				50/50	-3.5	26	7 500 (d)	7 500 (a)
Newave Aerochemical Co. Ltd.	FCY 9311	PG	22-05-20	100/0	-29.5	-21	14 100 (c)	14 100 (c)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
Newave Aerochemical Co. Ltd.	FCY-EGIV	EG	22-03-04	100/0	-29	-20	24 800 (f)	6 300 (a)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
Shaanxi Cleanway Aviation Chemical Co., Ltd	Cleansurface IV	PG	19-02-24 ⁹	100/0	-28.5	-19	15 200 (c)	15 200 (c)
				75/25	-19	-2	28 500 (c)	28 500 (c)
				50/50	-6.5	20	17 500 (c)	17 500 (c)

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.ugac.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

- 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.
- 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.
- 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:
 - The lowest temperature at which the fluid meets the aerodynamic acceptance test for a given aircraft type; or
 - 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.
- 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.
- Type I concentrate fluids have also been tested at 50/50 (glycol/water) dilution.
- If uncertain whether the aircraft to be treated conforms to the low speed or the high speed aerodynamic test, consult the aircraft manufacturer. The aerodynamic test is defined in SAE AS5900 (latest version).
- The viscosity values in this table are those of the fluids provided by the manufacturers for holdover time testing. For the holdover times to be valid, the viscosity of the fluid on the wing shall not be lower than that in this table. The user should periodically ensure that the viscosity of a fluid sample taken from the wing surface is not lower than that listed.
- The SAE AS9968 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 below. 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.

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 (Berkelius) 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	0 °C	0.3 rpm	10.0 minutes
i	SC4-31/13R	small sample adapter	9 mL	20 °C	0.3 rpm	15.0 minutes
j	SC4-31/13R	small sample adapter	9 mL	0 °C	0.3 rpm	10.0 minutes
k	SC4-31/13R	small sample adapter	9 mL	0 °C	0.3 rpm	30.0 minutes
l	SC4-31/13R	small sample adapter	9 mL	0 °C	0.3 rpm	65.0 minutes
m	LV0	ultra low adapter	16 mL	20 °C	0.3 rpm	10.0 minutes
n	LV1	big sample adapter	50 mL	20 °C	0.3 rpm	10.0 minutes
o	LV1	big sample adapter	55 mL	20 °C	0.3 rpm	10.0 minutes
p	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.

CAUTIONS AND NOTES FOR TABLES 51, 52, 53, 54 (CONT'D)

- 9 Fluids listed in *italics* have expired and 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 Currently in the test/re-test process. Contact the manufacturer for latest information.
- 13 For UCAR™ ADF XL54, refer to primary site qualification of UCAR™ ADF Concentrate.
- 14 For UCAR™ PG ADF Dilute 55/45, refer to primary site qualification of UCAR™ PG ADF Concentrate.
- 15 Dow UCAR™ ADF Concentrate, sold under the product name Inland ADF Concentrate, qualified from 2015-09-04.
- 16 Refer to preproduction qualification of SafeTemp® ES Plus submitted by HOC Industries, qualified from 2017-11-20.
- 17 Measurements using the SAE AS9968 method do not provide stable, reliable results. Use the manufacturer method to evaluate viscosity.
- 18 This fluid has been requalified according to multiple location test requirements; additional testing is required.
- 19 Fluid was not retested for low speed aerodynamics. This data will be removed four years after the expiry of the last low speed test.

TABLE 55: GUIDELINES FOR THE APPLICATION OF SAE TYPE I FLUID

Outside Air Temperature (OAT) ¹	One-Step Procedure Deicing Only ²	One-Step Procedure Anti-icing Only ³	Two-Step Procedure	
			First Step: Deicing ²	Second Step: Anti-icing ^{4,5}
0°C (32°F) and above	Heated Type I fluid/water mixture with a freezing point of at least 10°C (18°F) below OAT	Fluid/water mixture heated to at least 60°C (140°F) at the nozzle	Heated water or a heated fluid/water mixture	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
Below 0°C (32°F) to LOUT			Heated fluid/water mixture with a freezing point at OAT or below	

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. The 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 its freezing point buffer of 10°C (18°F).
- 2 When deicing, there is no minimum fluid quantity required, use as much fluid as necessary to ensure the aircraft is free of frozen contamination. A fluid temperature of at least 60°C (140°F) at the nozzle is desirable. Deicing is complete after all contamination is removed. There is no holdover time for a "deicing only" operation.
- 3 One-step anti-icing only procedure is only possible on a clean aircraft. If deicing and anti-icing are required, a two-step procedure should be followed.
- 4 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).
- 5 When anti-icing, a minimum quantity of 1 litre/m² (~2 gal./100 sq. ft.) of Type I fluid mixture heated to at least 60°C (140°F). This application is necessary to heat the surfaces, as heat contributes significantly to the Type I fluid holdover times.

CAUTIONS

- For heated fluids, the 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, etc. Consult the appropriate guidance (HOT Tables and TP14052) for the contaminant in question.

TABLE 56: GUIDELINES FOR THE APPLICATION OF SAE TYPE II AND IV FLUID
(FLUID CONCENTRATIONS IN % VOLUME)

Outside Air Temperature (OAT) ¹	One-Step Procedure Deicing Only ²	One-Step Procedure Anti-icing Only ³	Two-Step Procedure	
			First Step: Deicing ²	Second Step: Anti-icing ⁴
0°C (32°F) and above	Heated Type II or IV fluid/water mixture	100/0, 75/25, or 50/50 Heated or Unheated Type II or IV fluid/water mixture	Heated water or a heated 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 or Unheated Type II or IV fluid/water mixture	Heated 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 or Unheated Type II or IV fluid/water mixture		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 or Unheated Type II or IV fluid		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. Consider the use of Type I/III fluid when Type II/IV fluid cannot be used due to LOUT limitations (see Table 54 and Table 57). The LOUT for a given Type II/IV fluid is the higher (warmer) of:

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

Some diluted fluids have LOUTs that are below the coldest temperature for which holdover times are provided. Holdover times do not apply when anti-icing at temperatures for which holdover times are not provided.

- When deicing, there is no minimum fluid quantity required, use as much fluid as necessary to ensure the aircraft is free of frozen contamination. A fluid temperature of at least 60°C (140°F) at the nozzle is desirable. Deicing is complete after all contamination is removed. There is no holdover time for a “deicing only” operation.
- One-step anti-icing only procedure is only possible on a clean aircraft. If deicing and anti-icing are required, a two-step procedure should be followed.
- 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, in colder temperatures, or for critical surfaces constructed of composite materials. If necessary, the second step shall be applied area by area (sectionally).

CAUTIONS

- For heated fluids, the 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, etc. Consult the appropriate guidance (HOT Tables and TP14052) 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.

TABLE 57: GUIDELINES FOR THE APPLICATION OF UNHEATED SAE TYPE III FLUID
(FLUID CONCENTRATIONS IN % VOLUME)

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

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 due to LOUT limitations (see Table 60). The LOUT for a given Type III fluid is the higher (warmer) of:

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

Some diluted fluids have LOUTs that are below the coldest temperature for which holdover times are provided. Holdover times do not apply when anti-icing at temperatures for which holdover times are not provided.

- When deicing, there is no minimum fluid quantity required, use as much fluid as necessary to ensure the aircraft is free of frozen contamination. Deicing is complete after all contamination is removed. There is no holdover time for a “deicing only” operation.
- One-step anti-icing only procedure is only possible on a clean aircraft. If deicing and anti-icing are required, a two-step procedure should be followed.
- 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, in colder temperatures, or for critical surfaces constructed of composite materials. If necessary, the second step shall be applied area by area (sectionally).

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, etc. Consult the appropriate guidance (HOT Tables and TP14052) 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.

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.

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

Outside Air Temperature ^{1,2,3}	Type I	Outside Air Temperature ^{2,3}	Concentration Fluid/Water By % Volume	Type II	Type III ⁴	Type IV
-1°C and above (30°F and above)	0:34 (0:27) ⁵	-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)		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)		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)		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)		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)		below -21 to -25°C (below -6 to -13°F)	100/0	1:31	1:31	3:02
below -25°C to LOU ^T (below -13°F to LOU ^T)		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 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 (LOU^T) is respected.
- 3 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.
- 4 To use the Type III fluid frost holdover times, the fluid brand being used must be known. AllClear AeroClear MAX must be applied unheated.
- 5 Value in parentheses is for aircraft with critical surfaces that are predominantly or entirely constructed of composite materials.

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.

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	Very Light Snow, Snow Grains or Snow Pellets ^{4,5}	Light Snow, Snow Grains or Snow Pellets ^{4,5}	Moderate Snow, Snow Grains or Snow Pellets ⁴	Freezing Drizzle ⁶	Light Freezing Rain	Rain on Cold-Soaked Wing ⁷	Other ⁸
-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	0:03 - 0:05	0:02 - 0:04	CAUTION: No holdover time guidelines exist
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	0:03 - 0:05		
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 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.
- 6 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 7 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 8 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.

CAUTIONS

- These holdover times apply to aircraft with critical surfaces constructed predominantly or entirely of aluminum materials that have demonstrated satisfactory use of these holdover times.
- The responsibility for the application of these data remains with the user.
- Takeoff after the longest applicable holdover time has been exceeded is not permitted for Type I fluids.
- 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.

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	Very Light Snow, Snow Grains or Snow Pellets ^{4,5}	Light Snow, Snow Grains or Snow Pellets ^{4,5}	Moderate Snow, Snow Grains or Snow Pellets ⁴	Freezing Drizzle ⁶	Light Freezing Rain	Rain on Cold-Soaked Wing ⁷	Other ⁸
-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	0:03 - 0:05	0:01 - 0:04	CAUTION: No holdover time guidelines exist
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	0:03 - 0:05		
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 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.
- 6 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 7 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 8 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.

CAUTIONS

- These holdover times apply to newer aircraft with critical surfaces constructed predominantly or entirely of composite materials.
- The responsibility for the application of these data remains with the user.
- Takeoff after the longest applicable holdover time has been exceeded is not permitted for Type I fluids.
- 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.

**TABLE ADJ-4: ADJUSTED GENERIC HOLDOVER TIMES FOR
SAE TYPE II FLUIDS**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ² , or Ice Crystals	Snow, Snow Grains or Snow Pellets ^{3,4}	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold- Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	0:42 - 1:24	0:19 - 0:38	0:23 - 0:46	0:15 - 0:27	0:05 - 0:34	CAUTION: No holdover time guidelines exist
	75/25	0:19 - 0:42	0:11 - 0:19	0:11 - 0:30	0:08 - 0:15	0:03 - 0:19	
	50/50	0:11 - 0:19	0:04 - 0:08	0:06 - 0:11	0:05 - 0:07		
below -3 to -8°C (below 27 to 18°F)	100/0	0:23 - 0:34	0:15 - 0:27	0:15 - 0:34	0:11 - 0:15		
	75/25	0:19 - 0:38	0:08 - 0:15	0:11 - 0:19	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 ⁸	0:11 - 0:15 ⁸		
	75/25	0:19 - 0:38	0:06 - 0:15	0:11 - 0:19 ⁸	0:06 - 0:11 ⁸		
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 ⁹ (below 0 to -13°F)	100/0	0:11 - 0:15	0:01 - 0:02				
below -25°C to LOU ⁹ (below -13°F to LOU)	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 Ensure that the lowest operational use temperature (LOU) 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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).
- 9 If the LOU is unknown, no holdover time guidelines exist below -25°C (-13°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:01 - 2:17	1:50 - 2:00	0:57 - 1:50	0:30 - 0:57	0:30 - 1:16	0:23 - 0:34	0:07 - 1:05	CAUTION: No holdover time guidelines exist
	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		
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 ⁸	0:15 - 0:23 ⁸		
	75/25	0:27 - 1:27	1:12 - 1:31	0:38 - 1:12	0:19 - 0:38	0:11 - 0:42 ⁸	0:15 - 0:27 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-6: ADJUSTED TYPE II HOLDOVER TIMES FOR
AVIATION SHAANXI HI-TECH CLEANWING II**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ² , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-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	CAUTION: No holdover time guidelines exist
	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		
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 ⁸	0:15 - 0:19 ⁸		
	75/25	0:30 - 1:20	1:01 - 1:12	0:34 - 1:01	0:19 - 0:34	0:27 - 0:30 ⁸	0:15 - 0:19 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-7: ADJUSTED TYPE II HOLDOVER TIMES FOR
BEIJING YADILITE AVIATION YD-102 TYPE II**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ² , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	0:53 - 1:31	1:16 - 1:31	0:38 - 1:16	0:19 - 0:38	0:30 - 0:57	0:27 - 0:30	0:08 - 0:46	CAUTION: No holdover time guidelines exist
	75/25	0:19 - 0:42	0:38 - 0:49	0:19 - 0:38	0:11 - 0:19	0:11 - 0:30	0:08 - 0:15	0:03 - 0:19	
	50/50	0:11 - 0:19	0:19 - 0:23	0:08 - 0:19	0:04 - 0:08	0:06 - 0:11	0:05 - 0:07		
below -3 to -8°C (below 27 to 18°F)	100/0	0:34 - 1:08	0:57 - 1:08	0:27 - 0:57	0:15 - 0:27	0:27 - 0:38	0:19 - 0:19		
	75/25	0:23 - 0:38	0:30 - 0:38	0:15 - 0:30	0:08 - 0:15	0:11 - 0:19	0:07 - 0:11		
below -8 to -14°C (below 18 to 7°F)	100/0	0:34 - 1:08	0:46 - 0:57	0:23 - 0:46	0:11 - 0:23	0:27 - 0:38 ⁸	0:19 - 0:19 ⁸		
	75/25	0:23 - 0:38	0:27 - 0:34	0:15 - 0:27	0:06 - 0:15	0:11 - 0:19 ⁸	0:07 - 0:11 ⁸		
below -14 to -18°C (below 7 to 0°F)	100/0	0:15 - 0:34	0:15 - 0:23	0:05 - 0:15	0:02 - 0:05				
below -18 to -25°C (below 0 to -13°F)	100/0	0:15 - 0:34	0:07 - 0:11	0:02 - 0:07	0:01 - 0:02				
below -25 to -29°C (below -13 to -20°F)	100/0	0:15 - 0:34	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-8: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:40 - 3:02	1:58 - 2:00	1:12 - 1:58	0:46 - 1:12	1:01 - 1:31	0:34 - 1:05	0:08 - 1:08	CAUTION: No holdover time guidelines exist
	75/25	1:24 - 2:05	1:58 - 2:00	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		
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 ⁸	0:19 - 0:34 ⁸		
	75/25	0:19 - 0:49	1:01 - 1:16	0:30 - 1:01	0:15 - 0:30	0:19 - 0:53 ⁸	0:15 - 0:27 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-9: 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	Snow, Snow Grains or Snow Pellets ^{3,4}	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold- Soaked Wing ⁶	Other ⁷
-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	CAUTION: No holdover time guidelines exist
	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		
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 ⁸	0:27 - 0:42 ⁸		
	75/25	0:23 - 1:20	0:42 - 1:16	0:19 - 0:53 ⁸	0:23 - 0:34 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-10: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:09 - 3:02	2:00 - 2:00	1:27 - 2:00	0:49 - 1:27	1:12 - 1:31	0:57 - 1:08	0:11 - 1:31	CAUTION: No holdover time guidelines exist
	75/25	1:54 - 3:02	2:00 - 2:00	1:05 - 2:00	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		
below -3 to -8°C (below 27 to 18°F)	100/0	0:42 - 1:54	1:50 - 2:00	1:05 - 1:50	0:38 - 1:05	0:27 - 1:12	0:27 - 0:34		
	75/25	0:30 - 1:08	1:46 - 2:00	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 ⁸	0:27 - 0:34 ⁸		
	75/25	0:30 - 1:08	1:31 - 1:54	0:42 - 1:31	0:19 - 0:42	0:19 - 0:49 ⁸	0:27 - 0:34 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-11: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-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	CAUTION: No holdover time guidelines exist
	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 - 2:00	0:46 - 1:39	0:23 - 0:46	0:23 - 0:38	0:11 - 0:23		
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 ⁸	0:15 - 0:23 ⁸		
	75/25	0:30 - 1:01	0:42 - 0:49	0:19 - 0:42	0:08 - 0:19	0:19 - 0:30 ⁸	0:11 - 0:15 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-12: 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	Snow, Snow Grains or Snow Pellets ^{3,4}	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold- Soaked Wing ⁶	Other ⁷
-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	CAUTION: No holdover time guidelines exist
	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		
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 ⁸	0:11 - 0:27 ⁸		
	75/25	0:19 - 1:05	0:27 - 0:49	0:15 - 0:42 ⁸	0:07 - 0:23 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-13: 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	Snow, Snow Grains or Snow Pellets ^{3,4}	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold- Soaked Wing ⁶	Other ⁷
-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	CAUTION: No holdover time guidelines exist
	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		
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 ⁸	0:11 - 0:15 ⁸		
	75/25	0:23 - 0:49	0:08 - 0:15	0:11 - 0:23 ⁸	0:06 - 0:11 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

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

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ² , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:05 - 1:54	1:46 - 2:00	0:49 - 1:46	0:23 - 0:49	0:38 - 1:01	0:19 - 0:34	0:06 - 0:57	CAUTION: No holdover time guidelines exist
	75/25	0:34 - 1:01	1:01 - 1:16	0:30 - 1:01	0:15 - 0:30	0:19 - 0:38	0:11 - 0:19	0:05 - 0:27	
	50/50	0:11 - 0:23	0:19 - 0:23	0:11 - 0:19	0:06 - 0:11	0:08 - 0:15	0:06 - 0:08		
below -3 to -8°C (below 27 to 18°F)	100/0	0:30 - 1:08	1:05 - 1:24	0:30 - 1:05	0:15 - 0:30	0:27 - 0:49	0:11 - 0:23		
	75/25	0:23 - 0:49	0:38 - 0:49	0:19 - 0:38	0:08 - 0:19	0:15 - 0:27	0:11 - 0:15		
below -8 to -14°C (below 18 to 7°F)	100/0	0:30 - 1:08	0:46 - 0:57	0:23 - 0:46	0:11 - 0:23	0:27 - 0:49 ⁸	0:11 - 0:23 ⁸		
	75/25	0:23 - 0:49	0:27 - 0:34	0:15 - 0:27	0:06 - 0:15	0:15 - 0:27 ⁸	0:11 - 0:15 ⁸		
below -14 to -18°C (below 7 to 0°F)	100/0	0:15 - 0:46	0:15 - 0:23	0:05 - 0:15	0:02 - 0:05				
below -18 to -25°C (below 0 to -13°F)	100/0	0:15 - 0:46	0:07 - 0:11	0:02 - 0:07	0:01 - 0:02				
below -25 to -28.5°C (below -13 to -19°F)	100/0	0:15 - 0:46	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	0:53 - 1:50	1:58 - 2:00	0:53 - 1:58	0:27 - 0:53	0:38 - 1:01	0:27 - 0:38	0:05 - 0:53	CAUTION: No holdover time guidelines exist
	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		
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 ⁸	0:19 - 0:27 ⁸		
	75/25	0:42 - 1:05	0:49 - 1:05	0:23 - 0:49	0:11 - 0:23	0:19 - 0:49 ⁸	0:15 - 0:23 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-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	CAUTION: No holdover time guidelines exist
	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		
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 ⁸	0:15 - 0:23 ⁸		
	75/25	0:23 - 0:42	0:27 - 0:30	0:15 - 0:27	0:07 - 0:15	0:15 - 0:23 ⁸	0:11 - 0:15 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-17: ADJUSTED TYPE III HOLDOVER TIMES FOR ALLCLEAR AEROCLEAR MAX
APPLIED UNHEATED ON LOW SPEED AIRCRAFT¹**

Outside Air Temperature ²	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ³ , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{4,5}	Light Snow, Snow Grains or Snow Pellets ^{4,5}	Moderate Snow, Snow Grains or Snow Pellets ⁴	Freezing Drizzle ⁶	Light Freezing Rain	Rain on Cold-Soaked Wing ⁷	Other ⁸
-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	CAUTION: No holdover time guidelines exist
	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 -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.
- 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 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.
- 6 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 7 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 8 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-18: ADJUSTED TYPE III HOLDOVER TIMES FOR ALLCLEAR AEROCLEAR MAX
APPLIED UNHEATED ON HIGH SPEED AIRCRAFT¹**

Outside Air Temperature ²	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ³ , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{4,5}	Light Snow, Snow Grains or Snow Pellets ^{4,5}	Moderate Snow, Snow Grains or Snow Pellets ⁴	Freezing Drizzle ⁶	Light Freezing Rain	Rain on Cold-Soaked Wing ⁷	Other ⁸
-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	CAUTION: No holdover time guidelines exist
	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 -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.
- 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 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.
- 6 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 7 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 8 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 responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-19: ADJUSTED GENERIC HOLDOVER TIMES FOR
SAE TYPE IV FLUIDS**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ² , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-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	CAUTION: No holdover time guidelines exist
	75/25	1:05 - 2:02	1:35 - 1:50	0:57 - 1:35	0:30 - 0:57	0:38 - 1:01	0:23 - 0:34	0:07 - 0:57	
	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		
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	0:46 - 1:24	0:23 - 0:46	0:15 - 0:49	0:11 - 0:19		
below -8 to -14°C (below 18 to 7°F)	100/0	0:15 - 1:12	1:01 - 1:16	0:34 - 1:01	0:19 - 0:34	0:19 - 0:53 ⁸	0:15 - 0:19 ⁸		
	75/25	0:23 - 1:01	1:16 - 1:31	0:34 - 1:16	0:15 - 0:34	0:15 - 0:49 ⁸	0:11 - 0:19 ⁸		
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 ⁹ (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 LOU ⁹ (below -13°F to LOU)	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 Ensure that the lowest operational use temperature (LOU) 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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 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 adjusted 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).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).
- 9 If the LOU is unknown, no holdover time guidelines exist below -23.5°C (-10°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-20: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:32 - 3:02	2:00 - 2:00	1:27 - 2:00	0:46 - 1:27	1:05 - 1:31	0:46 - 1:05	0:08 - 1:27	CAUTION: No holdover time guidelines exist
	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	0:15 - 1:12	2:00 - 2:00	1:08 - 2:00	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 - 2:00	0:57 - 1:50	0:30 - 0:57	0:19 - 1:05 ⁸	0:15 - 0:19 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides adjusted allowance times for Type IV PG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE ADJ-21: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:31 - 3:02	2:00 - 2:00	1:20 - 2:00	0:38 - 1:20	1:24 - 1:31	1:01 - 1:16	0:15 - 1:31	CAUTION: No holdover time guidelines exist
	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	0:46 - 1:54	2:00 - 2:00	1:01 - 2:00	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 - 2:00	0:49 - 1:39	0:23 - 0:49	0:42 - 1:31 ⁸	0:34 - 0:57 ⁸		
	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 -20°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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides adjusted allowance times for Type IV PG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE ADJ-22: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:24 - 2:28	2:00 - 2:00	1:01 - 2:00	0:30 - 1:01	0:53 - 1:12	0:23 - 0:46	0:08 - 1:08	CAUTION: No holdover time guidelines exist
	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	1:12 - 2:51	1:50 - 2:00	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 - 2:00	0:49 - 1:43	0:23 - 0:49	0:49 - 1:08 ⁸	0:23 - 0:46 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides adjusted allowance times for Type IV EG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-23: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-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	CAUTION: No holdover time guidelines exist
	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 - 2:05	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 ⁸	0:15 - 0:27 ⁸		
	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	0:38 - 0:49	0:19 - 0:38	0:08 - 0:19				
below -18 to -25°C (below 0 to -13°F)	100/0	0:38 - 1:05	0:30 - 0:42	0:11 - 0:30	0:04 - 0:11				
below -25 to -30°C (below -13 to -22°F)	100/0	0:23 - 0:49	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides adjusted allowance times for Type IV EG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-24: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:24 - 2:28	2:00 - 2:00	1:12 - 2:00	0:42 - 1:12	0:53 - 1:12	0:34 - 0:49	0:11 - 1:01	CAUTION: No holdover time guidelines exist
	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	0:49 - 1:27	1:31 - 1:50	0:53 - 1:31	0:30 - 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	1:12 - 1:27	0:42 - 1:12	0:23 - 0:42	0:42 - 0:53 ⁸	0:27 - 0:42 ⁸		
	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	0:23 - 0:34	0:07 - 0:23	0:02 - 0:07				
below -18 to -25°C (below 0 to -13°F)	100/0	0:23 - 0:34	0:08 - 0:15	0:02 - 0:08	0:01 - 0:02				
below -25 to -26°C (below -13 to -15°F)	100/0	0:23 - 0:34	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides adjusted allowance times for Type IV PG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE ADJ-25: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-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	CAUTION: No holdover time guidelines exist
	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	1:01 - 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 ⁸	0:27 - 0:38 ⁸		
	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 -20°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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides adjusted allowance times for Type IV EG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE ADJ-26: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:43 - 3:02	2:00 - 2:00	1:16 - 2:00	0:42 - 1:16	1:31 - 1:31	0:53 - 1:27	0:15 - 1:31	CAUTION: No holdover time guidelines exist
	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	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 ⁸	0:34 - 0:49 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides adjusted allowance times for Type IV PG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-27: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:35 - 2:43	2:00 - 2:00	0:57 - 2:00	0:27 - 0:57	0:34 - 1:16	0:19 - 0:30	0:07 - 1:20	CAUTION: No holdover time guidelines exist
	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 - 2:47	2:00 - 2:00	0:57 - 2:00	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	2:00 - 2:00	0:57 - 2:00	0:27 - 0:57	0:46 - 1:12 ⁸	0:27 - 0:38 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides adjusted allowance times for Type IV EG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-28: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:43 - 3:02	2:00 - 2:00	1:20 - 2:00	0:42 - 1:20	1:01 - 1:31	0:42 - 1:01	0:19 - 1:31	CAUTION: No holdover time guidelines exist
	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	1:24 - 3:02	2:00 - 2:00	1:20 - 2:00	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	2:00 - 2:00	1:20 - 2:00	0:42 - 1:20	0:57 - 1:31 ⁸	0:34 - 1:01 ⁸		
	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	2:00 - 2:00	1:12 - 2:00	0:38 - 1:12				
below -18 to -25°C (below 0 to -13°F)	100/0	0:30 - 1:08	1:39 - 2:00	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides adjusted allowance times for Type IV EG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-29: ADJUSTED TYPE IV HOLDOVER TIMES FOR
CLARIANT MAX FLIGHT 04**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ² , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:02 - 3:02	2:00 - 2:00	2:00 - 2:00	1:05 - 2:00	1:31 - 1:31	0:53 - 1:08	0:15 - 1:31	CAUTION: No holdover time guidelines exist
	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	0:38 - 1:54	2:00 - 2:00	1:16 - 2:00	0:38 - 1:16	0:19 - 1:08	0:15 - 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	0:38 - 1:54	1:46 - 2:00	0:53 - 1:46	0:27 - 0:53	0:19 - 1:08 ⁸	0:15 - 0:30 ⁸		
	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 - 0:34	0:23 - 0:34	0:07 - 0:23	0:02 - 0:07				
below -18 to -23.5°C (below 0 to -10°F)	100/0	0:15 - 0:34	0:08 - 0:15	0:02 - 0:08	0:01 - 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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides adjusted allowance times for Type IV PG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-30: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:21 - 3:02	2:00 - 2:00	1:20 - 2:00	0:46 - 1:20	1:05 - 1:31	0:42 - 0:53	0:07 - 1:31	CAUTION: No holdover time guidelines exist
	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	1:20 - 2:59	1:54 - 2:00	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 ⁸	0:42 - 1:08 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides adjusted allowance times for Type IV EG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-31: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:50 - 3:02	2:00 - 2:00	1:16 - 2:00	0:42 - 1:16	1:31 - 1:31	0:38 - 1:16	0:15 - 1:08	CAUTION: No holdover time guidelines exist
	75/25	3:02 - 3:02	1:50 - 2:00	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		
below -3 to -8°C (below 27 to 18°F)	100/0	0:34 - 1:46	1:50 - 2:00	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 ⁸	0:19 - 0:30 ⁸		
	75/25	0:23 - 1:05	1:16 - 1:31	0:46 - 1:16	0:30 - 0:46	0:15 - 0:49 ⁸	0:15 - 0:30 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides adjusted allowance times for Type IV PG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-32: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:46 - 2:59	2:00 - 2:00	1:16 - 2:00	0:38 - 1:16	1:08 - 1:31	0:38 - 0:42	0:06 - 1:31	CAUTION: No holdover time guidelines exist
	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	1:20 - 3:02	2:00 - 2:00	1:08 - 2:00	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	2:00 - 2:00	1:08 - 2:00	0:38 - 1:08	0:49 - 1:24 ⁸	0:42 - 1:05 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides adjusted allowance times for Type IV EG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-33: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	3:02 - 3:02	2:00 - 2:00	1:20 - 2:00	0:49 - 1:20	1:08 - 1:31	0:46 - 1:16	0:11 - 1:16	CAUTION: No holdover time guidelines exist
	75/25	2:47 - 3:02	2:00 - 2:00	1:20 - 2:00	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		
below -3 to -8°C (below 27 to 18°F)	100/0	0:46 - 1:27	1:50 - 2:00	1:08 - 1:50	0:42 - 1:08	0:27 - 1:16	0:19 - 0:34		
	75/25	0:30 - 1:01	2:00 - 2:00	1:08 - 2:00	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 ⁸	0:19 - 0:34 ⁸		
	75/25	0:30 - 1:01	1:50 - 2:00	1:05 - 1:50	0:34 - 1:05	0:19 - 0:53 ⁸	0:19 - 0:34 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides adjusted allowance times for Type IV PG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-34: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:59 - 3:02	2:00 - 2:00	1:35 - 2:00	0:42 - 1:35	1:31 - 1:31	0:46 - 1:31	0:15 - 1:31	CAUTION: No holdover time guidelines exist
	75/25	2:59 - 3:02	2:00 - 2:00	1:27 - 2:00	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		
below -3 to -8°C (below 27 to 18°F)	100/0	0:42 - 1:43	2:00 - 2:00	1:16 - 2:00	0:34 - 1:16	0:19 - 1:12	0:19 - 0:30		
	75/25	0:30 - 1:31	2:00 - 2:00	1:08 - 2:00	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	2:00 - 2:00	1:05 - 2:00	0:30 - 1:05	0:19 - 1:12 ⁸	0:19 - 0:30 ⁸		
	75/25	0:30 - 1:31	2:00 - 2:00	0:57 - 2:00	0:23 - 0:57	0:15 - 0:49 ⁸	0:15 - 0:23 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides adjusted allowance times for Type IV PG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-35: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:09 - 3:02	2:00 - 2:00	1:27 - 2:00	0:49 - 1:27	1:12 - 1:31	0:57 - 1:08	0:11 - 1:31	CAUTION: No holdover time guidelines exist
	75/25	1:54 - 3:02	2:00 - 2:00	1:05 - 2:00	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		
below -3 to -8°C (below 27 to 18°F)	100/0	0:42 - 1:54	1:50 - 2:00	1:05 - 1:50	0:38 - 1:05	0:27 - 1:12	0:27 - 0:34		
	75/25	0:30 - 1:08	1:46 - 2:00	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 ⁸	0:27 - 0:34 ⁸		
	75/25	0:30 - 1:08	1:31 - 1:54	0:42 - 1:31	0:19 - 0:42	0:19 - 0:49 ⁸	0:27 - 0:34 ⁸		
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 -22°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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides adjusted allowance times for Type IV PG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-36: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:54 - 3:02	2:00 - 2:00	1:31 - 2:00	0:49 - 1:31	1:31 - 1:31	0:46 - 1:24	0:15 - 1:20	CAUTION: No holdover time guidelines exist
	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	0:46 - 1:24	2:00 - 2:00	1:12 - 2:00	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 - 2:00	1:01 - 1:50	0:34 - 1:01	0:27 - 1:16 ⁸	0:38 - 0:42 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides adjusted allowance times for Type IV PG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-37: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:35 - 2:24	2:00 - 2:00	1:01 - 2:00	0:30 - 1:01	0:53 - 1:31	0:38 - 0:57	0:15 - 1:31	CAUTION: No holdover time guidelines exist
	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	1:24 - 2:32	1:50 - 2:00	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 - 2:00	0:49 - 1:39	0:23 - 0:49	0:42 - 1:24 ⁸	0:34 - 0:53 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides adjusted allowance times for Type IV EG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-38: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:32 - 3:02	2:00 - 2:00	1:27 - 2:00	0:46 - 1:27	1:05 - 1:31	0:46 - 1:05	0:08 - 1:27	CAUTION: No holdover time guidelines exist
	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	0:15 - 1:12	2:00 - 2:00	1:08 - 2:00	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 - 2:00	0:57 - 1:50	0:30 - 0:57	0:19 - 1:05 ⁸	0:15 - 0:19 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides adjusted allowance times for Type IV PG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-39: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	0:57 - 2:02	1:50 - 2:00	1:01 - 1:50	0:34 - 1:01	0:30 - 1:08	0:27 - 0:30	0:11 - 1:12	CAUTION: No holdover time guidelines exist
	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	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 ⁸	0:23 - 0:30 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides adjusted allowance times for Type IV PG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-40: 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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:08 - 2:02	1:54 - 2:00	0:57 - 1:54	0:27 - 0:57	0:49 - 1:08	0:30 - 0:49	0:11 - 0:53	CAUTION: No holdover time guidelines exist
	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	0:42 - 1:58	1:43 - 2:00	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 ⁸	0:27 - 0:38 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides adjusted allowance times for Type IV PG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

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

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ² , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:05 - 3:02	2:00 - 2:00	1:50 - 2:00	1:05 - 1:50	1:31 - 1:31	0:46 - 1:20	0:15 - 1:31	CAUTION: No holdover time guidelines exist
	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	1:46 - 3:02	2:00 - 2:00	1:35 - 2:00	0:57 - 1:35	0:46 - 1:31	1:01 - 1:24		
	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	1:46 - 3:02	2:00 - 2:00	1:27 - 2:00	0:53 - 1:27	0:46 - 1:31 ⁸	1:01 - 1:24 ⁸		
	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 - 1:50	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 - 1:50	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 - 1:50	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides adjusted allowance times for Type IV EG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:39 - 3:02	2:00 - 2:00	1:05 - 2:00	0:30 - 1:05	0:49 - 1:31	0:23 - 0:38	0:07 - 1:27	CAUTION: No holdover time guidelines exist
	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	2:02 - 3:02	2:00 - 2:00	1:05 - 2:00	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	2:00 - 2:00	1:05 - 2:00	0:30 - 1:05	0:49 - 1:31 ⁸	0:30 - 0:46 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides adjusted allowance times for Type IV EG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold- Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:39 - 3:02	2:00 - 2:00	1:35 - 2:00	0:57 - 1:35	1:24 - 1:31	0:49 - 1:31	0:19 - 1:31	CAUTION: No holdover time guidelines exist
	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		
below -3 to -8°C (below 27 to 18°F)	100/0	0:42 - 2:40	2:00 - 2:00	1:24 - 2:00	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	2:00 - 2:00	1:20 - 2:00	0:46 - 1:20	0:19 - 1:12 ⁸	0:15 - 0:23 ⁸		
	75/25	0:34 - 1:24	1:20 - 1:31	0:46 - 1:20	0:27 - 0:46	0:15 - 0:53 ⁸	0:11 - 0:19 ⁸		
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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides adjusted allowance times for Type IV PG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:27 - 3:02	1:46 - 2:00	0:53 - 1:46	0:27 - 0:53	0:53 - 1:31	0:30 - 0:49	0:11 - 1:05	CAUTION: No holdover time guidelines exist
	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	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 ⁸	0:15 - 0:27 ⁸		
	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides adjusted allowance times for Type IV PG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**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	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	1:58 - 3:02	1:58 - 2:00	0:53 - 1:58	0:27 - 0:53	1:01 - 1:31	0:30 - 0:49	0:11 - 1:31	CAUTION: No holdover time guidelines exist
	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 - 2:36	1:39 - 2:00	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 ⁸	0:34 - 0:49 ⁸		
	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 -21°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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-48 provides adjusted allowance times for Type IV EG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

**TABLE ADJ-46: ADJUSTED TYPE IV HOLDOVER TIMES FOR
SHAANXI CLEANWAY AVIATION CLEANSURFACE IV**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist ² , or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{3,4}	Light Snow, Snow Grains or Snow Pellets ^{3,4}	Moderate Snow, Snow Grains or Snow Pellets ³	Freezing Drizzle ⁵	Light Freezing Rain	Rain on Cold-Soaked Wing ⁶	Other ⁷
-3°C and above (27°F and above)	100/0	2:09 - 3:02	2:00 - 2:00	1:27 - 2:00	0:46 - 1:27	1:31 - 1:31	1:05 - 1:08	0:11 - 1:31	CAUTION: No holdover time guidelines exist
	75/25	1:58 - 3:02	2:00 - 2:00	1:12 - 2:00	0:34 - 1:12	0:38 - 1:31	0:27 - 0:34	0:07 - 0:57	
	50/50	0:49 - 1:50	1:16 - 1:46	0:30 - 1:16	0:11 - 0:30	0:19 - 0:38	0:11 - 0:15		
below -3 to -8°C (below 27 to 18°F)	100/0	0:46 - 2:21	1:31 - 1:50	0:49 - 1:31	0:27 - 0:49	0:27 - 1:20	0:15 - 0:27		
	75/25	0:38 - 1:27	1:43 - 2:00	0:46 - 1:43	0:23 - 0:46	0:23 - 1:01	0:19 - 0:30		
below -8 to -14°C (below 18 to 7°F)	100/0	0:46 - 2:21	1:01 - 1:16	0:34 - 1:01	0:19 - 0:34	0:27 - 1:20 ⁸	0:15 - 0:27 ⁸		
	75/25	0:38 - 1:27	1:16 - 1:39	0:34 - 1:16	0:15 - 0:34	0:23 - 1:01 ⁸	0:19 - 0:30 ⁸		
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 -28.5°C (below -13 to -19°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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 50) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 5 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 6 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 7 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table Adj-49 provides adjusted allowance times for Type IV PG fluids in ice pellets and small hail).
- 8 No holdover time guidelines exist for this condition below -10°C (14°F).

CAUTIONS

- The responsibility for the application of these data remains with the user.
- The only acceptable decision-making criterion, for takeoff without a pre-takeoff contamination inspection, is the shorter time within the applicable table cell.
- 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.

TABLE ADJ-47: ADJUSTED ALLOWANCE TIMES FOR SAE TYPE III FLUIDS¹

Precipitation Types or Combinations	Applicable METAR Codes	Outside Air Temperature		
		-5 °C and above	Below -5 to -10 °C	Below -10 °C ²
Light Ice Pellets	-PL	8 minutes	8 minutes	Caution: No allowance times currently exist
Light Ice Pellets Mixed with Light Snow	-PLSN, -SNPL	8 minutes	8 minutes	
Light Ice Pellets Mixed with Light Freezing Drizzle or Moderate Freezing Drizzle	-PLFZDZ, -FZDZPL, FZDZPL	5 minutes	4 minutes	
Light Ice Pellets Mixed with Light Freezing Rain	-PLFZRA, -FZRAPL	5 minutes	4 minutes	
Light Ice Pellets Mixed with Light Rain	-PLRA, -RAPL	5 minutes ³		
Moderate Ice Pellets (or Small Hail ⁴)	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 Ensure that the lowest operational use temperature (LOUT) is respected.
- 3 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.
- 4 In Canada (and outside the US) the code GS is used when hail is less than 5 mm and GR when it is 5mm or greater. In the US, small hail is included with regular hail and the remarks section is used saying "GR LESS THAN ¼". If no intensity is reported with small hail, use the "moderate ice pellets or small hail" allowance times. If an intensity is reported 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 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.
- Allowance time cannot be extended by an inspection of the aircraft critical surfaces.
- 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.

**TABLE ADJ-48: ADJUSTED ALLOWANCE TIMES FOR SAE TYPE IV
ETHYLENE GLYCOL (EG) FLUIDS¹**

Precipitation Types or Combinations	Applicable METAR Codes	Outside Air Temperature			
		-5 °C and above	Below -5 to -10 °C	Below -10 to -16 °C	Below -16 to -22 °C ²
Light Ice Pellets	-PL	53 minutes	38 minutes	23 minutes	23 minutes
Light Ice Pellets Mixed with Light Snow	-PLSN, -SNPL	38 minutes	23 minutes	11 minutes	Caution: No allowance times currently exist
Light Ice Pellets Mixed with Light Freezing Drizzle or Moderate Freezing Drizzle	-PLFZDZ, -FZDZPL, FZDZPL	30 minutes	23 minutes		
Light Ice Pellets Mixed with Light Freezing Rain	-PLFZRA, -FZRAPL	30 minutes	23 minutes		
Light Ice Pellets Mixed with Light Rain	-PLRA, -RAPL	30 minutes ³			
Moderate Ice Pellets (or Small Hail ⁴)	PL, GS	27 minutes	19 minutes	8 minutes	8 minutes
Moderate Ice Pellets (or Small Hail ⁴) Mixed with Moderate Freezing Drizzle	PLFZDZ, GSFZDZ,	15 minutes	8 minutes		Caution: No allowance times currently exist
Moderate Ice Pellets (or Small Hail ⁴) Mixed with Moderate Rain	PLRA, GSRA, RAPL, RAGS	11 minutes ⁵			

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 based fluids applied on aircraft with rotation speeds of 100 knots or greater. The following fluids are ethylene glycol based; 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 EG 4, 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 Ensure that the lowest operational use temperature (LOUT) is respected.
- 3 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.
- 4 In Canada (and outside the US) the code GS is used when hail is less than 5 mm and GR when it is 5mm or greater. In the US, small hail is included with regular hail and the remarks section is used saying "GR LESS THAN ¼". If no intensity is reported with small hail, use the "moderate ice pellets or small hail" allowance times. If an intensity is reported 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.
- 5 No allowance times exist in this condition for temperatures of 0 °C and below.

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.
- Allowance time cannot be extended by an inspection of the aircraft critical surfaces.
- 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.

**TABLE ADJ-49: ADJUSTED ALLOWANCE TIMES FOR SAE TYPE IV
PROPYLENE GLYCOL (PG) FLUIDS¹**

Precipitation Types or Combinations	Applicable METAR Codes	Outside Air Temperature			
		-5 °C and above	Below -5 to -10 °C	Below -10 to -16 °C	Below -16 to -22 °C ²
Light Ice Pellets	-PL	38 minutes	23 minutes	23 minutes ³	23 minutes ³
Light Ice Pellets Mixed with Light Snow	-PLSN, -SNPL	30 minutes	11 minutes	11 minutes ³	Caution: No allowance times currently exist
Light Ice Pellets Mixed with Light Freezing Drizzle or Moderate Freezing Drizzle	-PLFZDZ, -FZDZPL, FZDZPL	19 minutes	8 minutes		
Light Ice Pellets Mixed with Light Freezing Rain	-PLFZRA, -FZRAPL	19 minutes	8 minutes		
Light Ice Pellets Mixed with Light Rain	-PLRA, -RAPL	19 minutes ⁴			
Moderate Ice Pellets (or Small Hail ⁵)	PL, GS	14 minutes	8 minutes	8 minutes ³	
Moderate Ice Pellets (or Small Hail ⁵) Mixed with Moderate Freezing Drizzle	PLFZDZ, GSFZDZ	8 minutes	5 minutes		Caution: No allowance times currently exist
Moderate Ice Pellets (or Small Hail ⁵) Mixed with Moderate Rain	PLRA, GSRA, RAPL, RAGS	8 minutes ⁶			

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 based fluids applied on aircraft with rotation speeds of 100 knots or greater. All Type IV fluids are propylene glycol based with the exception of 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 EG 4, JSC RCP Nordix Defrost NORTH 4, and Newave Aerochemical FCY-EGIV, which are ethylene glycol based. If the glycol type is unknown, the allowance times for SAE Type IV PG fluids should be used.
- 2 Ensure that the lowest operational use temperature (LOUT) is respected.
- 3 No allowance times exist for propylene glycol (PG) fluids when used on aircraft with rotation speeds less than 115 knots.
- 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 rain.
- 5 In Canada (and outside the US) the code GS is used when hail is less than 5 mm and GR when it is 5mm or greater. In the US, small hail is included with regular hail and the remarks section is used saying "GR LESS THAN ¼". If no intensity is reported with small hail, use the "moderate ice pellets or small hail" allowance times. If an intensity is reported 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.
- 6 No allowance times exist in this condition for temperatures of 0 °C and below.

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.
- Allowance time cannot be extended by an inspection of the aircraft critical surfaces.
- 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.

**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 Transport Canada.

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).