

Transport Canada Holdover Time (HOT) Guidelines Winter 2018-2019

Original Issue: August 7, 2018

This document should be used in conjunction with *Guidelines for Aircraft Ground Icing Operations* (TP 14052E, third edition, June 2018). The 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:
<http://www.tc.gc.ca/eng/civilaviation/standards/commerce-holdovertime-menu-1877.htm>.

REVISION	DATE	DESCRIPTION OF CHANGES	AFFECTED PAGES	AUTHOR

TABLE OF CONTENTS

Change Control Records	2
Table of Contents	3
How to Use This Document.....	4
Summary of Changes from Previous Year	5
Holdover Time (HOT) Guidelines for Winter 2018-2019	6
Table 1: Active Frost Holdover Times for SAE Type I, Type II, Type III, and Type IV Fluids	7
Table 2: Holdover Times for SAE Type I Fluid on Critical Aircraft Surfaces Composed Predominantly of Aluminum.....	8
Table 3: Holdover Times for SAE Type I Fluid on Critical Aircraft Surfaces Composed Predominantly of Composites	9
Table 4: Generic Holdover Times for SAE Type II Fluids.....	10
Table 5: Type II Holdover Times for ABAX ECOWING 26	11
Table 6: Type II Holdover Times for ABAX ECOWING AD-2.....	12
Table 7: Type II Holdover Times for Aviation Shaanxi Hi-Tech Cleanwing II	13
Table 8: Type II Holdover Times for Beijing Yadilite Aviation YD-102 Type II	14
Table 9: Type II Holdover Times for Clariant Safewing MP II FLIGHT	15
Table 10: Type II Holdover Times for Clariant Safewing MP II FLIGHT PLUS	16
Table 11: Type II Holdover Times for Cryotech Polar Guard® II	17
Table 12: Type II Holdover Times for Kifrost ABC-K Plus	18
Table 13: Type II Holdover Times for Kifrost Ice Clear II	19
Table 14: Type II Holdover Times for Newave Aerochemical FCY-2	20
Table 15: Type II Holdover Times for Newave Aerochemical FCY-2 Bio+	21
Table 16: Type II Holdover Times for Oksayd Defrost PG 2	22
Table 17: Type III Holdover Times for AllClear AeroClear MAX Applied Unheated on Low Speed Aircraft	23
Table 18: Type III Holdover Times for AllClear AeroClear MAX Applied Unheated on High Speed Aircraft	24
Table 19: Generic Holdover Times for SAE Type IV Fluids	25
Table 20: Type IV Holdover Times for ABAX ECOWING AD-49.....	26
Table 21: Type IV Holdover Times for CHEMCO ChemR EG IV	27
Table 22: Type IV Holdover Times for Clariant Max Flight 04	28
Table 23: Type IV Holdover Times for Clariant Max Flight AVIA.....	29
Table 24: Type IV Holdover Times for Clariant Max Flight SNEG.....	30
Table 25: Type IV Holdover Times for Clariant Safewing EG IV NORTH	31
Table 26: Type IV Holdover Times for Clariant Safewing MP IV LAUNCH	32
Table 27: Type IV Holdover Times for Clariant Safewing MP IV LAUNCH PLUS	33
Table 28: Type IV Holdover Times for Cryotech Polar Guard® Advance.....	34
Table 29: Type IV Holdover Times for Dow Chemical UCAR™ Endurance EG106.....	35
Table 30: Type IV Holdover Times for Dow Chemical UCAR™ FlightGuard AD-49	36
Table 31: Type IV Holdover Times for Inland Technologies ECO-SHIELD®	37
Table 32: Type IV Holdover Times for Kifrost ABC-S Plus.....	38
Table 33: Type IV Holdover Times for LNT Solutions E450	39
Table 34: Type IV Holdover Times for Newave Aerochemical FCY 9311	40
Table 35: Type IV Holdover Times for Oksayd Defrost ECO 4	41
Table 36: Type IV Holdover Times for Oksayd Defrost EG 4	42
Table 37: Type IV Holdover Times for Shaanxi Cleanway Aviation Cleansurface IV	43
Allowance Times Tables for Winter 2018-2019	44
Table 38: Allowance Times for SAE Type III Fluids	45
Table 39: Allowance Times for SAE Type IV Fluids	46
Supplemental Guidance for Winter 2018-2019	47
Table 40: Snowfall Intensities as a Function of Prevailing Visibility.....	48
Table 41: Type I Fluids Tested for Anti-Icing Performance and Aerodynamic Acceptance.....	49
Table 42: Type II Fluids Tested for Anti-Icing Performance and Aerodynamic Acceptance.....	52
Table 43: Type III Fluids Tested for Anti-Icing Performance and Aerodynamic Acceptance	54
Table 44: Type IV Fluids Tested for Anti-Icing Performance and Aerodynamic Acceptance	55
Table 45: Guidelines for the Application of SAE Type I Fluid	58
Table 46: Guidelines for the Application of SAE Type II and IV Fluid.....	59
Table 47: Guidelines for the Application of Heated SAE Type III Fluid	60
Table 48: Guidelines for the Application of Unheated SAE Type III Fluid	61
Appendix A: Adjusted Holdover Time (HOT) Guidelines	A-1
Appendix B: Testing Laboratories	B-1

HOW TO USE THIS DOCUMENT

Complementary Document

This document should be used in conjunction with *Guidelines for Aircraft Ground Icing Operations* (TP 14052E, third edition, June 2018). The two documents complement each other and should be used together for a thorough understanding of the subject matter.

Applicability

A new version of this document is published for each winter operating season, typically early in the August preceding the winter operating season. Updates to the winter's document may be published 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: <http://www.tc.gc.ca/eng/civilaviation/standards/commerce-holdovertime-menu-1877.htm>.

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.
- Summary of Changes from Previous Year: Describes key changes made to the document for the current winter operating season.
- Holdover Time Guidelines: Series of tables which 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 which 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 which 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.

SUMMARY OF CHANGES FROM PREVIOUS YEAR

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

Holdover Time Tables

- The active frost holdover time (HOT) guidelines are unchanged.
- The Type I HOT guidelines are unchanged, with the exception of the change to the note on freezing drizzle described below.
- Fluid-specific HOT guidelines have been created for three new fluids: Kilfrost Ice Clear II (Type II), Oksayd Defrost PG 2 (Type II), and Oksayd Defrost EG 4 (Type IV).
- The HOT guidelines for Kilfrost ABC-Ice Clear II and Clariant Safewing MP III 2031 ECO and for the 75/25 and 50/50 dilutions of ABAX ECOWING AD-49 and Dow UCAR™ FlightGuard AD-49 have been removed.
- Minor changes (both increases and decreases) have been made to the Type II generic holdover times as a result of the new and removed fluids and data.
- Increases have been made to the Type IV generic holdover times as a result of the new and removed fluids and data.
- The note on the freezing drizzle column heading in all HOT guidelines has been modified to make clear that freezing drizzle holdover times are applicable to intensities of light, moderate and heavy freezing drizzle.
- The “below -3 to -14°C” temperature band in the Type II and Type IV HOT guidelines has been split into two temperature bands: “below -3 to -8°C” and “below -8 to -14°C”. HOTs have stayed the same with the exception of those for snow in the “below -3 to -8°C” cells, which have generally increased.

Allowance Times Tables

- The allowance times tables are unchanged.

Supplemental Guidance

- The list of fluids (Tables 41, 42, 43 and 44) has been updated to reflect the latest information available on all de/anti-icing fluids.
- Lowest operational use temperatures (LOUTs) in degrees Fahrenheit have been converted to the nearest whole degree throughout the document. This impacts the values provided in the list of fluids (Tables 41, 42, 43 and 44) and the coldest temperatures provided in the Type II, III and IV HOT guidelines.
- LOUTs for 75/25 and 50/50 dilutions are no longer being capped by the lowest temperature for which holdover times are published. The LOUT values provided in the list of fluids (Tables 42, 43 and 44) are now the higher (warmer) of the lowest temperature at which the fluid meets the aerodynamic acceptance test for a given aircraft type and the actual freezing point of the fluid plus its freezing point buffer. The definition of LOUT provided in the list of fluids (Tables 42, 43 and 44) and the Type II, III and IV fluid application tables (Tables 46, 47, 48) has been modified accordingly. Although the LOUTs are no longer capped by the lowest temperatures for which holdover times are published, fluids cannot be used for anti-icing below the temperatures provided for dilutions in the holdover time table temperature bands.
- The fluid application tables are unchanged, with the exception of the change to the LOUT note described above.

Changes to TP 14052 Guidelines for Aircraft Ground Icing Operations

- The appendix “Changes to Guidelines for Aircraft Ground Icing Operations (TP 14052E)” has been removed from the HOT Guidelines. Its content has been incorporated into the *3rd Edition of Guidelines for Aircraft Ground Icing Operations* (TP 14052E).

HOLDOVER TIME (HOT) GUIDELINES FOR WINTER 2018-2019

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
below -1 to -3°C (below 30 to 27°F)			75/25	5:00	1:00	5:00
below -3 to -10°C (below 27 to 14°F)			50/50	3:00	0:30	3:00
below -10 to -14°C (below 14 to 7°F)		below -1 to -3°C (below 30 to 27°F)	100/0	8:00	2:00	12:00
below -14 to -21°C (below 7 to -6°F)			75/25	5:00	1:00	5:00
below -21 to -25°C (below -6 to -13°F)			50/50	1:30	0:30	3:00
below -25°C to LOUT (below -13°F to LOUT)		below -3 to -10°C (below 27 to 14°F)	100/0	8:00	2:00	10:00
			75/25	5:00	1:00	5:00
		below -10 to -14°C (below 14 to 7°F)	100/0	6:00	2:00	6:00
			75/25	1:00	1:00	1:00
		below -14 to -21°C (below 7 to -6°F)	100/0	6:00	2:00	6:00
		below -21 to -25°C (below -6 to -13°F)	100/0	2:00	2:00	4:00
		below -25°C (below -13°F)	100/0	No Holdover Time Guidelines Exist		

NOTES

- 1 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 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)	0:11 - 0:17	0:18	0:11 - 0:18	0:06 - 0:11	0:09 - 0:13	0:04 - 0:06	0:02 - 0:05	
below -3 to -6°C (below 27 to 21°F)	0:08 - 0:13	0:14	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	0:06 - 0:11	0:04 - 0:06	0:04 - 0:07	0:02 - 0:05		CAUTION: No holdover time guidelines exist
below -10°C (below 14°F)	0:05 - 0:09	0:07	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 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.

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 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)	0:09 - 0:16	0:12	0:06 - 0:12	0:03 - 0:06	0:08 - 0:13	0:04 - 0:06	0:01 - 0:05	
below -3 to -6°C (below 27 to 21°F)	0:06 - 0:08	0:11	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	0:05 - 0:09	0:02 - 0:05	0:04 - 0:07	0:02 - 0:05		CAUTION: No holdover time guidelines exist
below -10°C (below 14°F)	0:04 - 0:07	0:07	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 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.

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 or Ice Crystals	Snow, Snow Grains or Snow Pellets ^{2,3}	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-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	0:08 - 0:45	
	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 - 1:05	0:20 - 0:35	0:20 - 0:45	0:15 - 0:20		CAUTION: No holdover time guidelines exist
	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 - 1:05	0:15 - 0:30	0:20 - 0:45 ⁷	0:15 - 0:20 ⁷		
	75/25	0:25 - 0:50	0:08 - 0:20	0:15 - 0:25 ⁷	0:08 - 0:15 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:15 - 0:35	0:06 - 0:20				
below -18 to -25°C (below 0 to -13°F)	100/0	0:15 - 0:35 ⁸	0:02 - 0:09 ⁸				
below -25°C to LOUT (below -13°F to LOUT)	100/0	0:15 - 0:35 ⁸	0:01 - 0:06 ⁸				

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 No holdover time guidelines exist for this condition below -10°C (14°F).
- 8 If the LOUT is unknown, no holdover time guidelines exist below -24°C (-11°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 26

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	1:25 - 2:35	1:35	1:00 - 1:35	0:40 - 1:00	0:50 - 1:35	0:40 - 0:50	0:20 - 1:25	CAUTION: No holdover time guidelines exist
	75/25	1:05 - 1:55	1:20	0:40 - 1:20	0:20 - 0:40	0:45 - 1:05	0:25 - 0:35	0:10 - 1:00	
	50/50	0:30 - 0:45	0:40	0:20 - 0:40	0:07 - 0:20	0:15 - 0:25	0:08 - 0:10		
below -3 to -8°C (below 27 to 18°F)	100/0	0:45 - 2:15	1:30	0:55 - 1:30	0:35 - 0:55	0:30 - 1:10	0:15 - 0:35		
	75/25	0:35 - 1:15	1:05	0:35 - 1:05	0:20 - 0:35	0:20 - 0:50	0:15 - 0:25		
below -8 to -14°C (below 18 to 7°F)	100/0	0:45 - 2:15	1:25	0:55 - 1:25	0:35 - 0:55	0:30 - 1:10 ⁷	0:15 - 0:35 ⁷		
	75/25	0:35 - 1:15	0:55	0:30 - 0:55	0:15 - 0:30	0:20 - 0:50 ⁷	0:15 - 0:25 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:25 - 0:45	0:40	0:20 - 0:40	0:06 - 0:20				
below -18 to -25°C (below 0 to -13°F)	100/0	0:25 - 0:45	0:20	0:09 - 0:20	0:02 - 0:09				

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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 ABAX ECOWING AD-2

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	1:20 - 3:00	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	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	0:15 - 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	1:00 - 2:00	0:30 - 1:00	0:25 - 1:10	0:20 - 0:30		
	75/25	0:35 - 1:55	1:40	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	0:55 - 1:45	0:30 - 0:55	0:25 - 1:10 ⁷	0:20 - 0:30 ⁷		
	75/25	0:35 - 1:55	1:35	0:50 - 1:35	0:25 - 0:50	0:15 - 0:55 ⁷	0:20 - 0:35 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:15 - 0:40	0:40	0:20 - 0:40	0:06 - 0:20				
below -18 to -25°C (below 0 to -13°F)	100/0	0:15 - 0:40	0:20	0:09 - 0:20	0:02 - 0:09				
below -25 to -27°C (below -13 to -17°F)	100/0	0:15 - 0:40	0:20	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 II fluid cannot be used.
- 2 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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 AVIATION SHAANXI HI-TECH CLEANWING II

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

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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 BEIJING YADILITE AVIATION YD-102 TYPE II

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	1:10 - 2:00	1:40	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	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	0:10 - 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	0:35 - 1:15	0:20 - 0:35	0:35 - 0:50	0:25 - 0:25		
	75/25	0:30 - 0:50	0:40	0:20 - 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	0:30 - 1:00	0:15 - 0:30	0:35 - 0:50 ⁷	0:25 - 0:25 ⁷		
	75/25	0:30 - 0:50	0:35	0:20 - 0:35	0:08 - 0:20	0:15 - 0:25 ⁷	0:09 - 0:15 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:20 - 0:45	0:40	0:20 - 0:40	0:06 - 0:20				
below -18 to -25°C (below 0 to -13°F)	100/0	0:20 - 0:45	0:20	0:09 - 0:20	0:02 - 0:09				
below -25 to -29°C (below -13 to -20°F)	100/0	0:20 - 0:45	0:20	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 II fluid cannot be used.
- 2 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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

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

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Snow, Snow Grains or Snow Pellets ^{2,3}	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:40 - 4:00	0:50 - 1:50	1:25 - 2:00	0:45 - 1:00	0:15 - 2:00	
	75/25	2:35 - 4:00	1:00 - 1:45	1:35 - 2:00	0:50 - 1:15	0:15 - 1:15	
	50/50	1:05 - 2:20	0:15 - 0:25	0:30 - 1:05	0:15 - 0:20		
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		CAUTION: No holdover time guidelines exist
	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 ⁷	0:35 - 0:55 ⁷		
	75/25	0:30 - 1:45	0:55 - 1:40	0:25 - 1:10 ⁷	0:30 - 0:45 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:20 - 0:40	0:06 - 0:20				
below -18 to -25°C (below 0 to -13°F)	100/0	0:20 - 0:40	0:02 - 0:09				
below -25 to -29°C (below -13 to -20°F)	100/0	0:20 - 0:40	0:01 - 0:06				

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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 CRYOTECH POLAR GUARD® II

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:50 - 4:00	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	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	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	1:25 - 2:00	0:50 - 1:25	0:35 - 1:35	0:35 - 0:45		
	75/25	0:40 - 1:30	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	1:10 - 2:00	0:40 - 1:10	0:35 - 1:35 ⁷	0:35 - 0:45 ⁷		
	75/25	0:40 - 1:30	2:00	0:55 - 2:00	0:25 - 0:55	0:25 - 1:05 ⁷	0:35 - 0:45 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:25 - 0:50	1:35	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	0:15 - 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	0:08 - 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 II fluid cannot be used.
- 2 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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 or Ice Crystals	Snow, Snow Grains or Snow Pellets ^{2,3}	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:15 - 3:45	1:00 - 1:40	1:50 - 2:00	1:00 - 1:25	0:20 - 2:00	
	75/25	1:40 - 2:30	0:35 - 1:10	1:25 - 2:00	0:50 - 1:10	0:15 - 2:00	
	50/50	0:35 - 1:05	0:07 - 0:15	0:20 - 0:30	0:10 - 0:15		
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		CAUTION: No holdover time guidelines exist
	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 ⁷	0:15 - 0:35 ⁷		
	75/25	0:25 - 1:25	0:35 - 1:05	0:20 - 0:55 ⁷	0:09 - 0:30 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:30 - 0:55	0:06 - 0:20				
below -18 to -25°C (below 0 to -13°F)	100/0	0:30 - 0:55	0:02 - 0:09				
below -25 to -29°C (below -13 to -20°F)	100/0	0:30 - 0:55	0:01 - 0:06				

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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 KILFROST ICE CLEAR II

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	1:05 - 2:00	2:00	1:05 - 2:00	0:35 - 1:05	0:35 - 1:00	0:25 - 0:40	0:10 - 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	N/A	
below -3 to -8°C (below 27 to 18°F)	100/0	0:55 - 1:55	1:45	0:55 - 1:45	0:30 - 0:55	0:40 - 1:00	0:25 - 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	0:55 - 1:55	1:40	0:55 - 1:40	0:30 - 0:55	0:40 - 1:00 ⁷	0:25 - 0:30 ⁷		
	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	0:40	0:20 - 0:40	0:06 - 0:20				
below -18 to -24°C (below 0 to -11°F)	100/0	0:30 - 0:55	0:20	0:09 - 0:20	0:02 - 0:09				

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Snow, Snow Grains or Snow Pellets ^{2,3}	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	1:15 - 2:25	0:30 - 0:55	0:35 - 1:05	0:25 - 0:35	0:08 - 0:45	
	75/25	0:50 - 1:30	0:20 - 0:40	0:25 - 0:45	0:15 - 0:25	0:05 - 0:25	
	50/50	0:25 - 0:35	0:15 - 0:25	0:10 - 0:20	0:07 - 0:10		
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		CAUTION: No holdover time guidelines exist
	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 ⁷	0:15 - 0:20 ⁷		
	75/25	0:30 - 1:05	0:10 - 0:20	0:15 - 0:30 ⁷	0:08 - 0:15 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:25 - 0:35	0:06 - 0:20				
below -18 to -25°C (below 0 to -13°F)	100/0	0:25 - 0:35	0:02 - 0:09				
below -25 to -28°C (below -13 to -18°F)	100/0	0:25 - 0:35	0:01 - 0:06				

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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 NEWAVE AEROCHEMICAL FCY-2 BIO+

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

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	0:55 - 1:50	1:50	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	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	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	0:45 - 1:25	0:25 - 0:45	0:35 - 0:50	0:20 - 0:30		
	75/25	0:40 - 1:20	1:10	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	0:40 - 1:15	0:20 - 0:40	0:35 - 0:50 ⁷	0:20 - 0:30 ⁷		
	75/25	0:40 - 1:20	0:55	0:25 - 0:55	0:10 - 0:25	0:25 - 0:40 ⁷	0:15 - 0:20 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:35 - 1:05	0:40	0:20 - 0:40	0:06 - 0:20				
below -18 to -25°C (below 0 to -13°F)	100/0	0:35 - 1:05	0:20	0:09 - 0:20	0:02 - 0:09				
below -25 to -27°C (below -13 to -17°F)	100/0	0:35 - 1:05	0:20	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 II fluid cannot be used.
- 2 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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 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	0:45 - 1:55	1:20	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	N/A	
below -3 to -10°C (below 27 to 14°F)	100/0	0:50 - 1:40	1:20	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	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 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.

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 ALLCLEAR AEROCLEAR MAX
APPLIED UNHEATED ON HIGH SPEED AIRCRAFT¹**

Outside Air Temperature ²	Fluid Concentration Fluid/Water By % Volume	Freezing Fog 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	0:45 - 1:55	1:20	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	N/A	
below -3 to -10°C (below 27 to 14°F)	100/0	0:50 - 1:40	1:20	0:40 - 1:20	0:18 - 0:40	0:25 - 0:45	0:15 - 0:25		CAUTION: No holdover time guidelines exist
	75/25	N/A	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	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	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 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 38 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 or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶	
-3°C and above (27°F and above)	100/0	1:15 - 2:40	2:00	1:10 - 2:00	0:35 - 1:10	0:40 - 1:30	0:25 - 0:40	0:08 - 1:10	CAUTION: No holdover time guidelines exist	
	75/25	1:25 - 2:40	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	0:25 - 1:00	0:10 - 0:25	0:15 - 0:40	0:09 - 0:20	0:09 - 0:20		
below -3 to -8°C (below 27 to 18°F)	100/0	0:20 - 1:35	1:50	0:55 - 1:50	0:30 - 0:55	0:25 - 1:20	0:20 - 0:25	0:09 - 0:20	CAUTION: No holdover time guidelines exist	
	75/25	0:30 - 1:20	1:50	1:00 - 1:50	0:30 - 1:00	0:20 - 1:05	0:15 - 0:25	0:09 - 0:20		
below -8 to -14°C (below 18 to 7°F)	100/0	0:20 - 1:35	1:20	0:45 - 1:20	0:25 - 0:45	0:25 - 1:20 ⁷	0:20 - 0:25 ⁷	0:09 - 0:20	CAUTION: No holdover time guidelines exist	
	75/25	0:30 - 1:20	1:40	0:45 - 1:40	0:20 - 0:45	0:20 - 1:05 ⁷	0:15 - 0:25 ⁷	0:09 - 0:20		
below -14 to -18°C (below 7 to 0°F)	100/0	0:20 - 0:40	0:40	0:20 - 0:40	0:06 - 0:20	CAUTION: No holdover time guidelines exist				
below -18 to -25°C (below 0 to -13°F)	100/0	0:20 - 0:40 ⁸	0:20 ⁸	0:09 - 0:20 ⁸	0:02 - 0:09 ⁸					
below -25°C to LOUT (below -13°F to LOUT)	100/0	0:20 - 0:40 ⁸	0:20 ⁸	0:06 - 0:20 ⁸	0:01 - 0:06 ⁸					

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 No holdover time guidelines exist for this condition below -10°C (14°F).
- 8 If the LOUT is unknown, no holdover time guidelines exist below -22.5°C (-8.5°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 or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶	
-3°C and above (27°F and above)	100/0	3:20 - 4:00	2:00	1:55 - 2:00	1:00 - 1:55	1:25 - 2:00	1:00 - 1:25	0:10 - 1:55		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
below -3 to -8°C (below 27 to 18°F)	100/0	0:20 - 1:35	2:00	1:30 - 2:00	0:45 - 1:30	0:25 - 1:25	0:20 - 0:25	CAUTION: No holdover time guidelines exist		
	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	1:15 - 2:00	0:40 - 1:15	0:25 - 1:25 ⁷	0:20 - 0:25 ⁷			
	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	0:40	0:20 - 0:40	0:06 - 0:20					
below -18 to -25°C (below 0 to -13°F)	100/0	0:25 - 0:40	0:20	0:09 - 0:20	0:02 - 0:09					
below -25 to -26°C (below -13 to -15°F)	100/0	0:25 - 0:40	0:20	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 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 CHEMCO CHEMR EG IV

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:05 - 3:35	2:00	1:15 - 2:00	0:35 - 1:15	0:45 - 1:40	0:25 - 0:40	0:09 - 1:45	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
below -3 to -8°C (below 27 to 18°F)	100/0	1:25 - 3:40	2:00	1:15 - 2:00	0:35 - 1:15	1:00 - 1:35	0:35 - 0:50		CAUTION: No holdover time guidelines exist
	75/25	N/A	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	1:15 - 2:00	0:35 - 1:15	1:00 - 1:35 ⁷	0:35 - 0:50 ⁷		
	75/25	N/A	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	0:40	0:30 - 0:40	0:15 - 0:30				
below -18 to -25°C (below 0 to -13°F)	100/0	0:40 - 1:25	0:40	0:30 - 0:40	0:15 - 0:30				
below -25 to -27°C (below -13 to -17°F)	100/0	0:40 - 1:25	0:40	0:30 - 0:40	0:15 - 0:30				

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 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 CLARIANT MAX FLIGHT 04

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:40 - 4:00	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	N/A	
below -3 to -8°C (below 27 to 18°F)	100/0	0:50 - 2:30	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	1:10 - 2:00	0:35 - 1:10	0:25 - 1:30 ⁷	0:20 - 0:40 ⁷		
	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	0:40	0:20 - 0:40	0:06 - 0:20				
below -18 to -23.5°C (below 0 to -10°F)	100/0	0:20 - 0:45	0:20	0:09 - 0:20	0:02 - 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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 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 CLARIANT MAX FLIGHT AVIA

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

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 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 CLARIANT MAX FLIGHT SNEG

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:25 - 4:00	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	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	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	1:20 - 2:00	0:45 - 1:20	0:30 - 1:25	0:25 - 0:40		
	75/25	0:30 - 1:25	1:55	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	1:10 - 2:00	0:40 - 1:10	0:30 - 1:25 ⁷	0:25 - 0:40 ⁷		
	75/25	0:30 - 1:25	1:40	1:00 - 1:40	0:40 - 1:00	0:20 - 1:05 ⁷	0:20 - 0:40 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:20 - 0:50	0:40	0:20 - 0:40	0:06 - 0:20				
below -18 to -25°C (below 0 to -13°F)	100/0	0:20 - 0:50	0:20	0:09 - 0:20	0:02 - 0:09				
below -25 to -29°C (below -13 to -20°F)	100/0	0:20 - 0:50	0:20	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 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 CLARIANT SAFEWING EG IV NORTH

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

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 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 CLARIANT SAFEWING MP IV LAUNCH

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	4:00 - 4:00	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	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	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	1:30 - 2:00	0:55 - 1:30	0:35 - 1:40	0:25 - 0:45		
	75/25	0:40 - 1:20	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	1:20 - 2:00	0:50 - 1:20	0:35 - 1:40 ⁷	0:25 - 0:45 ⁷		
	75/25	0:40 - 1:20	2:00	1:25 - 2:00	0:45 - 1:25	0:25 - 1:10 ⁷	0:25 - 0:45 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:30 - 0:50	1:15	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	0:09 - 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	0:06 - 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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 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 CLARIANT SAFEWING MP IV LAUNCH PLUS

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶	
-3°C and above (27°F and above)	100/0	3:55 - 4:00	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	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	0:45 - 1:35	0:20 - 0:45	0:25 - 1:00	0:15 - 0:20	0:20 - 2:00		
below -3 to -8°C (below 27 to 18°F)	100/0	0:55 - 2:15	2:00	1:40 - 2:00	0:45 - 1:40	0:25 - 1:35	0:25 - 0:40	0:20 - 0:30	CAUTION: No holdover time guidelines exist	
	75/25	0:40 - 2:00	2:00	1:30 - 2:00	0:35 - 1:30	0:20 - 1:05	0:20 - 0:30	0:20 - 0:30		
below -8 to -14°C (below 18 to 7°F)	100/0	0:55 - 2:15	2:00	1:25 - 2:00	0:40 - 1:25	0:25 - 1:35 ⁷	0:25 - 0:40 ⁷	0:20 - 0:30 ⁷		
	75/25	0:40 - 2:00	2:00	1:15 - 2:00	0:30 - 1:15	0:20 - 1:05 ⁷	0:20 - 0:30 ⁷	0:20 - 0:30 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:25 - 0:50	1:15	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	0:09 - 0:30	0:03 - 0:09					
below -25 to -29°C (below -13 to -20°F)	100/0	0:25 - 0:50	0:20	0:06 - 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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 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 CRYOTECH POLAR GUARD® ADVANCE

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:50 - 4:00	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	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	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	1:25 - 2:00	0:50 - 1:25	0:35 - 1:35	0:35 - 0:45		
	75/25	0:40 - 1:30	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	1:10 - 2:00	0:40 - 1:10	0:35 - 1:35 ⁷	0:35 - 0:45 ⁷		
	75/25	0:40 - 1:30	2:00	0:55 - 2:00	0:25 - 0:55	0:25 - 1:05 ⁷	0:35 - 0:45 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:25 - 0:50	1:35	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	0:15 - 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	0:08 - 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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 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 DOW CHEMICAL UCAR™ ENDURANCE EG106

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:05 - 3:10	2:00	1:20 - 2:00	0:40 - 1:20	1:10 - 2:00	0:50 - 1:15	0:20 - 2:00	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
below -3 to -8°C (below 27 to 18°F)	100/0	1:50 - 3:20	2:00	1:10 - 2:00	0:35 - 1:10	0:55 - 1:50	0:45 - 1:10		CAUTION: No holdover time guidelines exist
	75/25	N/A	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	1:05 - 2:00	0:30 - 1:05	0:55 - 1:50 ⁷	0:45 - 1:10 ⁷		
	75/25	N/A	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	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	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	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 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 DOW CHEMICAL UCAR™ FLIGHTGUARD AD-49

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶		
-3°C and above (27°F and above)	100/0	3:20 - 4:00	2:00	1:55 - 2:00	1:00 - 1:55	1:25 - 2:00	1:00 - 1:25	0:10 - 1:55			
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
below -3 to -8°C (below 27 to 18°F)	100/0	0:20 - 1:35	2:00	1:30 - 2:00	0:45 - 1:30	0:25 - 1:25	0:20 - 0:25	CAUTION: No holdover time guidelines exist			
	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	1:15 - 2:00	0:40 - 1:15	0:25 - 1:25 ⁷	0:20 - 0:25 ⁷				
	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	0:40	0:20 - 0:40	0:06 - 0:20						
below -18 to -25°C (below 0 to -13°F)	100/0	0:25 - 0:40	0:20	0:09 - 0:20	0:02 - 0:09						
below -25 to -26°C (below -13 to -15°F)	100/0	0:25 - 0:40	0:20	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 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 INLAND TECHNOLOGIES ECO-SHIELD®

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	1:15 - 2:40	2:00	1:20 - 2:00	0:45 - 1:20	0:40 - 1:30	0:35 - 0:40	0:15 - 1:35	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
below -3 to -8°C (below 27 to 18°F)	100/0	1:10 - 2:35	2:00	1:10 - 2:00	0:40 - 1:10	0:50 - 1:25	0:30 - 0:40		CAUTION: No holdover time guidelines exist
	75/25	N/A	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	1:05 - 1:55	0:35 - 1:05	0:50 - 1:25 ⁷	0:30 - 0:40 ⁷		
	75/25	N/A	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	0:40	0:20 - 0:40	0:06 - 0:20				
below -18 to -25°C (below 0 to -13°F)	100/0	0:30 - 1:00	0:20	0:09 - 0:20	0:02 - 0:09				
below -25 to -25.5°C (below -13 to -14°F)	100/0	0:30 - 1:00	0:20	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 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 KILFROST ABC-S PLUS

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:10 - 4:00	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	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	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	1:50 - 2:00	1:05 - 1:50	0:25 - 1:35	0:20 - 0:30		
	75/25	0:45 - 1:50	1:50	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	1:45 - 2:00	1:00 - 1:45	0:25 - 1:35 ⁷	0:20 - 0:30 ⁷		
	75/25	0:45 - 1:50	1:45	1:00 - 1:45	0:35 - 1:00	0:20 - 1:10 ⁷	0:15 - 0:25 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:40 - 1:00	0:40	0:20 - 0:40	0:06 - 0:20				
below -18 to -25°C (below 0 to -13°F)	100/0	0:40 - 1:00	0:20	0:09 - 0:20	0:02 - 0:09				
below -25 to -28°C (below -13 to -18°F)	100/0	0:40 - 1:00	0:20	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 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 LNT SOLUTIONS E450

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	1:50 - 2:55	2:00	1:35 - 2:00	1:00 - 1:35	1:35 - 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	N/A	
below -3 to -8°C (below 27 to 18°F)	100/0	1:30 - 3:55	2:00	1:20 - 2:00	0:50 - 1:20	1:45 - 2:00	1:05 - 1:40		
	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	1:30 - 3:55	1:50	1:10 - 1:50	0:45 - 1:10	1:45 - 2:00 ⁷	1:05 - 1:40 ⁷		
	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 - 1:05	2:00	1:05 - 2:00	0:20 - 1:05				
below -18 to -22.5°C (below 0 to -9°F)	100/0	0:35 - 1:05	2:00	0:40 - 2:00	0:15 - 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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 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 NEWAVE AEROCHEMICAL FCY 9311

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶		
-3°C and above (27°F and above)	100/0	1:55 - 4:00	2:00	1:10 - 2:00	0:35 - 1:10	1:10 - 2:00	0:40 - 1:05	0:15 - 1:25			
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
below -3 to -8°C (below 27 to 18°F)	100/0	0:35 - 2:05	1:50	0:55 - 1:50	0:30 - 0:55	0:35 - 1:20	0:20 - 0:35	CAUTION: No holdover time guidelines exist			
	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	0:50 - 1:35	0:25 - 0:50	0:35 - 1:20 ⁷	0:20 - 0:35 ⁷				
	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	0:40	0:20 - 0:40	0:06 - 0:20						
below -18 to -25°C (below 0 to -13°F)	100/0	0:30 - 0:55	0:20	0:09 - 0:20	0:02 - 0:09						
below -25 to -29.5°C (below -13 to -21°F)	100/0	0:30 - 0:55	0:20	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 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 OKSAYD DEFROST ECO 4

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	1:30 - 2:40	2:00	1:15 - 2:00	0:35 - 1:15	1:05 - 1:30	0:40 - 1:05	0:15 - 1:10	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
below -3 to -8°C (below 27 to 18°F)	100/0	0:55 - 2:35	2:00	1:05 - 2:00	0:35 - 1:05	0:50 - 1:20	0:35 - 0:50		CAUTION: No holdover time guidelines exist
	75/25	N/A	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	1:00 - 2:00	0:30 - 1:00	0:50 - 1:20 ⁷	0:35 - 0:50 ⁷		
	75/25	N/A	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	0:40	0:20 - 0:40	0:06 - 0:20				
below -18 to -25°C (below 0 to -13°F)	100/0	0:30 - 0:50	0:20	0:09 - 0:20	0:02 - 0:09				
below -25 to -25.5°C (below -13 to -14°F)	100/0	0:30 - 0:50	0:20	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 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 OKSAYD DEFROST EG 4

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:45 - 4:00	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	N/A	
below -3 to -8°C (below 27 to 18°F)	100/0	2:20 - 4:00	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	1:55 - 2:00	1:10 - 1:55	1:00 - 2:00 ⁷	1:20 - 1:50 ⁷		
	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	0:40	0:30 - 0:40	0:15 - 0:30				
below -18 to -25°C (below 0 to -13°F)	100/0	0:45 - 2:25	0:40	0:30 - 0:40	0:15 - 0:30				
below -25 to -26°C (below -13 to -15°F)	100/0	0:45 - 2:25	0:40	0:30 - 0:40	0:15 - 0:30				

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 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 SHAANXI CLEANWAY AVIATION CLEANSURFACE IV

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:50 - 4:00	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	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	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	1:05 - 2:00	0:35 - 1:05	0:35 - 1:45	0:20 - 0:35		
	75/25	0:50 - 1:55	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	0:45 - 1:20	0:25 - 0:45	0:35 - 1:45 ⁷	0:20 - 0:35 ⁷		
	75/25	0:50 - 1:55	1:40	0:45 - 1:40	0:20 - 0:45	0:30 - 1:20 ⁷	0:25 - 0:40 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:30 - 0:50	0:40	0:20 - 0:40	0:06 - 0:20				
below -18 to -25°C (below 0 to -13°F)	100/0	0:30 - 0:50	0:20	0:09 - 0:20	0:02 - 0:09				
below -25 to -28.5°C (below -13 to -19°F)	100/0	0:30 - 0:50	0:20	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 39 provides allowance times for ice pellets and small hail).
- 7 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 2018-2019

TABLE 38: ALLOWANCE TIMES FOR SAE TYPE III FLUIDS¹

Precipitation Type	Outside Air Temperature		
	-5°C and above	Below -5 to -10°C	Below -10°C ²
Light Ice Pellets	10 minutes	10 minutes	Caution: No allowance times currently exist
Light Ice Pellets Mixed with Snow	10 minutes	10 minutes	
Light Ice Pellets Mixed with Freezing Drizzle	7 minutes	5 minutes	
Light Ice Pellets Mixed with Freezing Rain	7 minutes	5 minutes	
Light Ice Pellets Mixed with Rain	7 minutes ³		
Moderate Ice Pellets (or Small Hail) ⁴	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 below 0°C; consider use of light ice pellets mixed with freezing rain.
- 4 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 snow is reported, use the "light ice pellets mixed with 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: freezing drizzle, freezing rain or rain.

TABLE 39: ALLOWANCE TIMES FOR SAE TYPE IV FLUIDS¹

Precipitation Type	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	50 minutes	30 minutes	30 minutes ³	30 minutes ³
Light Ice Pellets Mixed with Snow	40 minutes	15 minutes	15 minutes ³	
Light Ice Pellets Mixed with Freezing Drizzle	25 minutes	10 minutes		Caution: No allowance times currently exist
Light Ice Pellets Mixed with Freezing Rain	25 minutes	10 minutes		
Light Ice Pellets Mixed with Rain	25 minutes ⁴			
Moderate Ice Pellets (or Small Hail) ⁵	25 minutes ⁶	10 minutes	10 minutes ³	10 minutes ⁷
Moderate Ice Pellets (or Small Hail) ⁵ Mixed with Freezing Drizzle	10 minutes	7 minutes		Caution: No allowance times currently exist
Moderate Ice Pellets (or Small Hail) ⁵ Mixed with Rain	10 minutes ⁸			

NOTES

- 1 These allowance times are for use with undiluted (100/0) fluids applied on aircraft with rotation speeds of 100 knots or greater. All Type IV fluids are propylene glycol based with the exception of CHEMCO ChemR EG IV, Clariant Max Flight AVIA, Clariant Safewing EG IV NORTH, Dow EG106, LNT Solutions E450 and Oksayd Defrost EG 4, which are ethylene glycol based.
- 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. (For these aircraft, if the fluid type is not known, assume zero allowance time.)
- 4 No allowance times exist in this condition for temperatures below 0°C; consider use of light ice pellets mixed with freezing rain.
- 5 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 snow is reported, use the “light ice pellets mixed with snow” allowance times.
- 6 Allowance time is 15 minutes for propylene glycol (PG) fluids or when the fluid type is unknown.
- 7 No allowance times exist for propylene glycol (PG) fluids in this condition for temperatures below -16°C.
- 8 No allowance times exist in this condition for temperatures below 0°C.

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: freezing drizzle, freezing rain or rain.

SUPPLEMENTAL GUIDANCE FOR WINTER 2018-2019

TABLE 40: 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	≤3/4 (≤1200)	>3/4 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	≤3/8 (≤600)	>3/8 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 41:
TYPE I FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE
(see cautions and notes on page 57)

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	70/30	-26	-15	-32	-26
ALAB Industries	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.	Arctica DG ready-to-use	DEG	22-03-26	as supplied	-26	-15	-26	-15
Arcton Ltd.	Arctica DG 91 Concentrate	DEG	17-07-16 ⁹	75/25	-25 ¹⁴	-13 ¹⁴	-25	-13
AVIAFLUID International Ltd.	AVIAFLO EG	EG	21-06-19	70/30	-40.5	-41	-44	-47
Aviation Shaanxi Hi-Tech Physical Chemical Co. Ltd.	Cleanwing I	PG	19-09-30	75/25	Not tested ¹⁰	Not tested ¹⁰	-39.5	-39
Aviation Xi'an High-Tech Physical Chemical Co. Ltd.	KHF-1	PG	19-05-22	75/25	Not tested ¹⁰	Not tested ¹⁰	-38.5	-37
Beijing Wangye Aviation Chemical Product Co Ltd.	KLA-1	EG	19-09-08	60/40	Not tested ¹⁰	Not tested ¹⁰	-30.5	-23
Beijing Wangye Aviation Chemical Product Co Ltd.	KLA-1A	EG	22-05-22	60/40	Not tested ¹⁰	Not tested ¹⁰	-32	-26
Beijing Yadilite Aviation Advanced Materials Corporation	YD-101 Type I	PG	21-03-07	60/40	Not tested ¹⁰	Not tested ¹⁰	-30	-22
Beijing Yadilite Aviation Advanced Materials Corporation	YD-101A Type I	EG	21-03-07	70/30	Not tested ¹⁰	Not tested ¹⁰	-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	20-04-01	70/30	-37	-35	-43	-45
CHEMCO Inc.	CHEMR REG I	EG	22-05-25	75/25	-36	-33	-40.5	-41
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	70/30	-40	-40	-45.5	-50
Clariant Produkte (Deutschland) GmbH	Safewing EG I 1996 (88)	EG	19-10-15	70/30	-39.5	-39	-41.5	-43
Clariant Produkte (Deutschland) GmbH	Safewing MP I 1938 ECO	PG	20-05-11	65/35	-25.5	-14	-32	-26
Clariant Produkte (Deutschland) GmbH	Safewing MP I 1938 ECO (80)	PG	20-05-20	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	21-02-24	as supplied	Not tested ¹⁰	Not tested ¹⁰	-19	-2

TABLE 41 (CONT'D):
TYPE I FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE
(see cautions and notes on page 57)

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 MP I ECO PLUS (80)	PG	19-03-13	71/29	-25	-13	-33	-27
Clariant Produkte (Deutschland) GmbH	Safewing MP I LFD 88	PG	19-04-06	65/35	-26	-15	-33	-27
Cryotech Deicing Technology	Polar Plus®	PG	20-01-13	63/37	-27	-17	-32	-26
Cryotech Deicing Technology	Polar Plus® LT	PG	20-01-26	63/37	-27	-17	-33	-27
Cryotech Deicing Technology	Polar Plus® LT (80)	PG	20-04-12	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	19-05-11	75/25	-36	-33	-45	-49
Dow Chemical Company	UCAR™ ADF XL54 ¹⁶	EG	19-05-11	as supplied	-33	-27	-33	-27
Dow Chemical Company	UCAR™ PG ADF Concentrate	PG	19-05-11	65/35	-25	-13	-32	-26
Dow Chemical Company	UCAR™ PG ADF Dilute 55/45 ¹⁷	PG	19-05-11	as supplied	-24	-11	-25	-13
DR Energy Group LTD. ¹¹	Northern Guard I	EG	17-06-16 ⁹	65/35	Not tested ¹⁰	Not tested ¹⁰	-39.5	-39
Gansu xiexin huineng Science and technology development Co., Ltd.	XHN-1	PG DEG	19-10-04	75/25	Not tested ¹⁰	Not tested ¹⁰	-36	-33
Heilongjiang Hangjie Aero-chemical Technology Co. Ltd.	HJF-1	EG	21-06-14	65/35	Not tested ¹⁰	Not tested ¹⁰	-42	-44
Heilongjiang Hangjie Aero-chemical Technology Co. Ltd.	HJF-1A	EG	16-09-02 ⁹	75/25	Not tested ¹⁰	Not tested ¹⁰	-40.5	-41
HOC Industries	SafeTemp® ES Plus	PG	20-04-12	65/35	-25.5	-14	-29	-20
Inland Technologies	DuraGly-E Type I ADF Concentrate	EG	19-01-13	60/40	-33	-27	-33	-27
Inland Technologies	DuraGly-P Type I ADF Concentrate	PG	15-02-04 ⁹	60/40	-25	-13	-25	-13
Inland Technologies	Inland ADF Concentrate ¹² (Multiple Location)	EG	Y-M-D ¹²	75/25	-36	-33	-42.5	-45
Inland Technologies	SafeTemp® ES Plus (Multiple Location)	PG	18-08-29	65/35	-25.5	-14	-31	-24
Kilfrost Limited	Kilfrost DF Plus	PG	19-07-16	69/31	-25.5	-14	-32	-26
Kilfrost Limited	Kilfrost DF Plus (80)	PG	20-05-02	69/31	-26	-15	-31.5	-25
Kilfrost Limited	Kilfrost DF Plus (88)	PG	19-07-16	63/37	-25.5	-14	-32	-26
Kilfrost Limited	Kilfrost DF ^{Sustain}	NCG	19-08-06	68/32	-34	-29	-41	-42

TABLE 41 (CONT'D):
TYPE I FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE
(see cautions and notes on page 57)

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
LNT Solutions	LNT E188	EG	21-08-22	70/30	-30.5	-23	-41	-42
<i>LNT Solutions</i>	<i>LNT P180</i>	PG	<i>17-10-04¹³</i>	69/31	-26	-15	-32	-26
LNT Solutions	LNT P188	PG	18-11-28	70/30	-24.5	-12	-31.5	-25
Newave Aerochemical Co. Ltd.	FCY-1A	EG	19-02-20	75/25	-40	-40	-40	-40
Newave Aerochemical Co. Ltd.	FCY-1Bio+	EG	20-07-22	75/25	Not tested ¹⁰	Not tested ¹⁰	-40.5	-41
Oksayd Co. Ltd.	DEFROST ECO 1	NG	16-07-09 ⁹	70/30	Not tested ¹⁰	Not tested ¹⁰	-36	-33
Oksayd Co. Ltd.	DEFROST EG 88.1	EG	19-04-24	70/30	-40.5	-41	-44.5	-48
Oksayd Co. Ltd.	DEFROST PG 1	PG	19-10-18	70/30	-24.5	-12	-31.5	-25
Shaanxi Cleanway Aviation Chemical Co., Ltd	Cleansurface I	EG	21-08-22	75/25	Not tested ¹⁰	Not tested ¹⁰	-40.5	-41
Shaanxi Cleanway Aviation Chemical Co., Ltd	Cleansurface I-BIO	EG	22-05-02	75/25	Not tested ¹⁰	Not tested ¹⁰	-37	-35
<i>Velvana a.s.¹¹</i>	<i>AIRVEL OK 1</i>	PG	<i>17-01-28⁹</i>	70/30	-26	-15	-30	-22
Xinjiang Zhongtian	Clearice-I Type I	EG	19-05-24	60/40	Not tested ¹⁰	Not tested ¹⁰	-30	-22

TABLE 42:
TYPE II FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE
(see cautions and notes on page 57)

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 26	PG	17-04-28 ⁹	100/0	-25	-13	4 900 (f)	4 600 (a)
				75/25	-14	7	2 200 (a)	2 200 (a)
				50/50	-4	25	50 (a)	50 (a)
ABAX Industries	ECOWING AD-2	PG	19-04-19	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	19-05-11	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 (k)
Clariant Produkte (Deutschland) GmbH	Safewing MP II FLIGHT	PG	20-02-20	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	100/0	-29	-20	3 650 (l)	3 100 (a)
				75/25	-14.5	6	12 400 (l)	10 450 (a)
				50/50	-4	25	7 800 (l)	7 050 (a)
Cryotech Deicing Technology	Polar Guard® II	PG	19-03-06	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)
Kilfrost Limited	ABC-K Plus	PG	18-11-22	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)
Kilfrost Limited	Ice Clear II	PG	20-06-20	100/0	-24	-11	8 450 (a)	8 450 (a)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
Newave Aerochemical Co. Ltd.	FCY-2	PG	19-03-16	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)

TABLE 42 (CONT'D):
TYPE II FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE
(see cautions and notes on page 57)

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		
Newave Aerochemical Co. Ltd.	FCY-2 Bio+	PG	19-04-10	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)
Oksayd Co. Ltd.	Defrost PG 2	PG	20-06-27	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)

TABLE 43:
TYPE III FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE
(see cautions and notes on page 57)

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	19-04-14	100/0	-16	3	-35	-31	7 800 (j)	Not Available ¹⁵
				75/25	Dilution Not Applicable		Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable		Dilution Not Applicable	

TABLE 44:
TYPE IV FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE
(see cautions and notes on page 57)

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	20-04-25	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	
CHEMCO Inc.	ChemR EG IV	EG	19-03-17	100/0	-27	-17	46 400 (i)	19 450 (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	16-07-23 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	
Clariant Produkte (Deutschland) GmbH	Max Flight AVIA	EG	20-06-06	100/0	-28.5	-19	1 000 (k)	1 000 (k)
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
Clariant Produkte (Deutschland) GmbH	Max Flight SNEG	PG	20-05-25	100/0	-29	-20	8 700 (m)	8 050 (a)
				75/25	-14	7	20 200 (n)	21 800 (c)
				50/50	-3	27	13 600(n)	15 000 (c)
Clariant Produkte (Deutschland) GmbH	Safewing EG IV NORTH	EG	18-04-06 ¹³	100/0	-30	-22	830 (k)	830 (k)
				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	20-03-07	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	19-02-24	100/0	-29	-20	8 700 (m)	8 450 (a)
				75/25	-14	7	18 800 (n)	17 200 (c)
				50/50	-3.5	26	9 700 (m)	12 150 (a)
Cryotech Deicing Technology	Polar Guard® Advance	PG	19-02-16	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)
Dow Chemical Company	UCAR™ Endurance EG106 De/Anti-Icing Fluid	EG	19-04-05	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	

TABLE 44 (CONT'D):
TYPE IV FLUIDS TESTED FOR ANTI-ICING PERFORMANCE AND AERODYNAMIC ACCEPTANCE
(see cautions and notes on page 57)

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		
Dow Chemical Company	UCAR™ FlightGuard AD-49	PG	19-04-12	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	18-02-22 ¹³	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	
Kilfrost Limited	ABC-S Plus	PG	19-05-03	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)
LNT Solutions	LNT E450	EG	17-07-29 ¹³	100/0	-22.5	-9	45 300 (i)	Not Available ¹⁶
				75/25	Dilution Not Applicable		Dilution Not Applicable	
				50/50	Dilution Not Applicable		Dilution Not Applicable	
Newave Aerochemical Co. Ltd.	FCY 9311	PG	20-01-23	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	
Oksayd Co. Ltd.	Defrost ECO 4	PG	19-06-19	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	
Oksayd Co. Ltd.	Defrost EG 4	EG	20-05-17	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	
Shaanxi Cleanway Aviation Chemical Co., Ltd	Cleansurface IV	PG	19-02-24	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 41, 42, 43, 44

CAUTIONS

- This table lists fluids that have been tested with respect to anti-icing performance and aerodynamic acceptance (Type I: SAE AMS1424 §3.5.2 and §3.5.3; Type II/ III/ IV: SAE AMS1428 §3.2.4 and §3.2.5) only. These tests were conducted by Anti-icing Materials International Laboratory: www.uqac.ca/ami. 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.
- LOUT data provided in these tables is based strictly on the manufacturer's data; the end user is responsible for verifying the validity of this data.
- Type I fluids supplied in concentrated form must not be used in that form and must be diluted.

NOTES

- 1 PG = conventional glycol (propylene glycol); EG = conventional glycol (ethylene glycol); DEG = conventional glycol (diethylene glycol); NCG = non-conventional glycol (organic non-ionic diols and triols, e.g. 1,3-propanediol, glycerine) and mixtures of non-conventional glycol and conventional glycol; NG = non-glycol (e.g. organic salts) and mixtures of non-glycol and glycol.
- 2 Expiry date is the earlier expiry date of the Aerodynamic Test(s) or Water Spray Endurance Test. Fluids that are tested after the issuance of this list will appear in a later update.
- 3 The values in this table were determined using test results from pre-production fluid samples when available. In some cases, the fluid manufacturer requested the publication of a more conservative value than the pre-production test value. The lowest operational use temperature (LOUT) for a given fluid is the higher (warmer) of:
 - a) The lowest temperature at which the fluid meets the aerodynamic acceptance test for a given aircraft type; or
 - b) The actual freezing point of the fluid plus its freezing point buffer (Type I = 10 °C/18 °F; Type II/III/IV = 7 °C/13 °F).
- 4 Note: LOUTs are rounded to the nearest half degree Celsius and the values in degrees Fahrenheit are calculated to the nearest whole degree.
- 5 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.
- 6 Type I concentrate fluids have also been tested at 50/50 (glycol/water) dilution.
- 7 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).
- 8 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.

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

- 9 Fluids listed in italics have expired and will be removed from this listing four years after expiry.
- 10 Manufacturer has indicated fluid was not tested.
- 11 Manufacturer has not provided fluid information as required in SAE ARP5718A; fluid may be removed from this listing in subsequent revisions.
- 12 Dow UCAR™ ADF Concentrate, sold under the product name Inland ADF Concentrate, qualified from 2015-09-04.
- 13 Currently in the test/re-test process.
- 14 Fluid was not retested for low speed aerodynamics. This data will be removed four years after the expiry of the last low speed test.
- 15 Measurements using the SAE AS9968 method do not provide stable, reliable results. Use the manufacturer method to evaluate viscosity.
- 16 For UCAR™ ADF XL54, refer to primary site qualification of UCAR™ ADF Concentrate.
- 17 For UCAR™ PG ADF Dilute 55/45, refer to primary site qualification of UCAR™ PG ADF Concentrate.

TABLE 45: GUIDELINES FOR THE APPLICATION OF SAE TYPE I FLUID

Outside Air Temperature (OAT) ¹	One-Step Procedure De/Anti-icing	Two-Step Procedure	
		First Step: Deicing	Second Step: Anti-icing ²
0°C (32°F) and above	Heated mix of fluid and water with a freezing point of at least 10°C (18°F) below OAT	Heated water or a heated fluid/water mixture	Heated mix of fluid and water 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 must not be used at temperatures below their lowest operational use temperature (LOUT).
- 2 To be applied before first step fluid freezes, typically within 3 minutes. (This time may be higher than 3 minutes in some conditions, but potentially lower in heavy precipitation, colder temperatures, or for critical surfaces constructed of composite materials. If necessary, the second step shall be applied area by area.)

CAUTIONS

- This table is applicable for the use of Type I holdover time guidelines in all conditions, including active frost. If holdover times are not required, a temperature of 60°C (140°F) at the nozzle is desirable.
- If holdover times are required, the temperature of water or fluid/water mixtures shall be at least 60°C (140°F) at the nozzle. Upper temperature limit shall not exceed fluid and aircraft manufacturers' recommendations.
- To use Type I Holdover Times Guidelines in all conditions including active frost, an additional minimum of 1 litre/m² (~2 gal./100 sq. ft.) of heated Type I fluid mixture must be applied to the surfaces after all frozen contamination is removed. This application is necessary to heat the surfaces, as heat contributes significantly to the Type I fluid holdover times. The required protection can be provided using a 1-step method by applying more fluid than is strictly needed to just remove all of the frozen contamination (the same additional amount stated above is required).
- The lowest operational use temperature (LOUT) for a given Type I fluid is the higher (warmer) of:
 - a) The lowest temperature at which the fluid meets the aerodynamic acceptance test for a given aircraft type; or
 - b) The actual freezing point of the fluid plus its freezing point buffer of 10°C (18°F).
- Wing skin temperatures may differ and in some cases may be lower than the OAT. A stronger mix (more glycol) may be needed under these conditions.

**TABLE 46: GUIDELINES FOR THE APPLICATION OF
SAE TYPE II AND IV FLUID**
(FLUID CONCENTRATIONS IN % VOLUME)

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

NOTES

- 1 One step or second step fluids must not be used at temperatures below their lowest operational use temperature (LOUT). First step fluids must not be used below their freezing points. Consideration should be given to the use of Type I/III fluid when Type II/IV fluid cannot be used due to LOUT limitations (see Table 45, 47, 48). The LOUT for a given Type II/IV fluid is the higher (warmer) of:
 - a) The lowest temperature at which the fluid meets the aerodynamic acceptance test for a given aircraft type; or
 - b) The actual freezing point of the fluid plus its freezing point buffer of 7°C (13°F).
- 2 To be applied before first step fluid freezes, typically within 3 minutes. (This time may be longer than 3 minutes in some conditions, but potentially shorter in heavy precipitation, in colder temperatures, or for critical surfaces constructed of composite materials. If necessary, the second step shall be applied area by area.)
- 3 Clean aircraft may be anti-iced with unheated fluid.

CAUTIONS

- For heated fluids, a fluid temperature not less than 60°C (140°F) at the nozzle is desirable.
- Upper temperature limit shall not exceed fluid and aircraft manufacturers' recommendations.
- Wing skin temperatures may differ and in some cases may be lower than the OAT. A stronger mix (more glycol) may be needed under these conditions.
- 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 47: GUIDELINES FOR THE APPLICATION OF
HEATED SAE TYPE III FLUID**
(FLUID CONCENTRATIONS IN % VOLUME)

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

NOTES

- 1 One step or second step fluids must not be used at temperatures below their lowest operational use temperature (LOUT). First step fluids must not be used below their freezing points. Consider the use of Type I when Type III fluid cannot be used (see Table 45). The LOUT for a given Type III fluid is the higher (warmer) of:
 - a) The lowest temperature at which the fluid meets the aerodynamic acceptance test for a given aircraft type; or
 - b) The actual freezing point of the fluid plus its freezing point buffer of 7°C (13°F).
- 2 To be applied before first step fluid freezes, typically within 3 minutes. (This time may be longer than 3 minutes in some conditions, but potentially shorter in heavy precipitation, in colder temperatures, or for critical surfaces constructed of composite materials. If necessary, the second step shall be applied area by area.)
- 3 For heated fluids, a fluid temperature not less than 60°C (140°F) at the nozzle is desirable.

CAUTIONS

- To use Type III Holdover Times Guidelines in all conditions including active frost, an additional minimum of 1 litre/m² (~2 gal./100 sq. ft.) of heated Type III fluid mixture must be applied to the surfaces after all frozen contamination is removed. This application is necessary to heat the surfaces, as heat contributes significantly to the Type III fluid holdover times. The required protection can be provided using a 1-step method by applying more fluid than is strictly needed to just remove all of the frozen contamination (the same additional amount stated above is required).
- If holdover times are required, the temperature of fluid/water mixtures shall be at least 60°C (140°F) at the nozzle. Upper temperature limit shall not exceed fluid and aircraft manufacturers' recommendations.
- Wing skin temperatures may differ and in some cases may be lower than the OAT. A stronger mix (more glycol) may be needed under these conditions.
- 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.

**TABLE 48: GUIDELINES FOR THE APPLICATION OF
UNHEATED SAE TYPE III FLUID**
(FLUID CONCENTRATIONS IN % VOLUME)

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

NOTES

- 1 One step or second step fluids must not be used at temperatures below their lowest operational use temperature (LOUT). First step fluids must not be used below their freezing points. Consider the use of Type I when Type III fluid cannot be used (see Table 45). The LOUT for a given Type III fluid is the higher (warmer) of:
 - a) The lowest temperature at which the fluid meets the aerodynamic acceptance test for a given aircraft type; or
 - b) The actual freezing point of the fluid plus its freezing point buffer of 7°C (13°F).
- 2 To be applied before first step fluid freezes, typically within 3 minutes. (This time may be longer than 3 minutes in some conditions, but potentially shorter in heavy precipitation, in colder temperatures, or for critical surfaces constructed of composite materials. If necessary, the second step shall be applied area by area.)
- 3 For heated fluids, a fluid temperature not less than 60°C (140°F) at the nozzle is desirable.
- 4 One-step procedure with unheated Type III fluid is only possible on a clean aircraft. If deicing is required, a two-step procedure must be used.

CAUTIONS

- Upper temperature limit shall not exceed fluid and aircraft manufacturers' recommendations.
- Wing skin temperatures may differ and in some cases may be lower than the OAT. A stronger mix (more glycol) may be needed under these conditions.
- 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.

ADJUSTED HOLDOVER TIME (HOT) GUIDELINES FOR WINTER 2018-2019

Table Adj-1: Adjusted Active Frost Holdover Times for SAE Type I, Type II, Type III, and Type IV Fluids.....	A-3
Table Adj-2: Adjusted Holdover Times for SAE Type I Fluid on Critical Aircraft Surfaces Composed Predominantly of Aluminum	A-4
Table Adj-3: Adjusted Holdover Times for SAE Type I Fluid on Critical Aircraft Surfaces Composed Predominantly of Composites	A-5
Table Adj-4: Adjusted Generic Holdover Times for SAE Type II Fluids	A-6
Table Adj-5: Adjusted Type II Holdover Times for ABAX ECOWING 26	A-7
Table Adj-6: Adjusted Type II Holdover Times for ABAX ECOWING AD-2.....	A-8
Table Adj-7: Adjusted Type II Holdover Times for Aviation Shaanxi Hi-Tech Cleanwing II.....	A-9
Table Adj-8: Adjusted Type II Holdover Times for Beijing Yadilite Aviation YD-102 Type II	A-10
Table Adj-9: Adjusted Type II Holdover Times for Clariant Safewing MP II FLIGHT.....	A-11
Table Adj-10: Adjusted Type II Holdover Times for Clariant Safewing MP II FLIGHT PLUS	A-12
Table Adj-11: Adjusted Type II Holdover Times for Cryotech Polar Guard® II.....	A-13
Table Adj-12: Adjusted Type II Holdover Times for Kilfrost ABC-K Plus	A-14
Table Adj-13: Adjusted Type II Holdover Times for Kilfrost Ice Clear II.....	A-15
Table Adj-14: Adjusted Type II Holdover Times for Newave Aerochemical FCY-2.....	A-16
Table Adj-15: Adjusted Type II Holdover Times for Newave Aerochemical FCY-2 Bio+	A-17
Table Adj-16: Adjusted Type II Holdover Times for Oksayd Defrost PG 2	A-18
Table Adj-17: Adjusted Type III Holdover Times for AllClear AeroClear MAX Applied Unheated on Low Speed Aircraft.....	A-19
Table Adj-18: Adjusted Type III Holdover Times for AllClear AeroClear MAX Applied Unheated on High Speed Aircraft.....	A-20
Table Adj-19: Adjusted Generic Holdover Times for SAE Type IV Fluids	A-21
Table Adj-20: Adjusted Type IV Holdover Times for ABAX ECOWING AD-49	A-22
Table Adj-21: Adjusted Type IV Holdover Times for CHEMCO ChemR EG IV	A-23
Table Adj-22: Adjusted Type IV Holdover Times for Clariant Max Flight 04.....	A-24
Table Adj-23: Adjusted Type IV Holdover Times for Clariant Max Flight AVIA	A-25
Table Adj-24: Adjusted Type IV Holdover Times for Clariant Max Flight SNEG	A-26
Table Adj-25: Adjusted Type IV Holdover Times for Clariant Safewing EG IV NORTH	A-27
Table Adj-26: Adjusted Type IV Holdover Times for Clariant Safewing MP IV LAUNCH.....	A-28
Table Adj-27: Adjusted Type IV Holdover Times for Clariant Safewing MP IV LAUNCH PLUS	A-29
Table Adj-28: Adjusted Type IV Holdover Times for Cryotech Polar Guard® Advance	A-30
Table Adj-29: Adjusted Type IV Holdover Times for Dow Chemical UCAR™ Endurance EG106	A-31
Table Adj-30: Adjusted Type IV Holdover Times for Dow Chemical UCAR™ FlightGuard AD-49	A-32
Table Adj-31: Adjusted Type IV Holdover Times for Inland Technologies ECO-SHIELD®.....	A-33
Table Adj-32: Adjusted Type IV Holdover Times for Kilfrost ABC-S Plus.....	A-34
Table Adj-33: Adjusted Type IV Holdover Times for LNT Solutions E450.....	A-35
Table Adj-34: Adjusted Type IV Holdover Times for Newave Aerochemical FCY 9311.....	A-36
Table Adj-35: Adjusted Type IV Holdover Times for Oksayd Defrost ECO 4	A-37
Table Adj-36: Adjusted Type IV Holdover Times for Oksayd Defrost EG 4	A-38
Table Adj-37: Adjusted Type IV Holdover Times for Shaanxi Cleanway Aviation Cleansurface IV	A-39
Table Adj-38: Adjusted Allowance Times for SAE Type III Fluids	A-40
Table Adj-39: Adjusted Allowance Times for SAE Type IV Fluids	A-41

**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 (0:26) ⁵	-1°C and above (30°F and above)	100/0	6:04	1:31	9:07
below -1 to -3°C (below 30 to 27°F)			75/25	3:48	0:45	3:48
below -3 to -10°C (below 27 to 14°F)			50/50	2:16	0:22	2:16
below -10 to -14°C (below 14 to 7°F)		below -1 to -3°C (below 30 to 27°F)	100/0	6:04	1:31	9:07
below -14 to -21°C (below 7 to -6°F)			75/25	3:48	0:45	3:48
below -21 to -25°C (below -6 to -13°F)			50/50	1:08	0:22	2:16
below -25°C to LOUT (below -13°F to LOUT)		below -3 to -10°C (below 27 to 14°F)	100/0	6:04	1:31	7:36
			75/25	3:48	0:45	3:48
		below -10 to -14°C (below 14 to 7°F)	100/0	4:33	1:31	4:33
			75/25	0:45	0:45	0:45
		below -14 to -21°C (below 7 to -6°F)	100/0	4:33	1:31	4:33
		below -21 to -25°C (below -6 to -13°F)	100/0	1:31	1:31	3:02
		below -25°C (below -13°F)	100/0	No Holdover Time Guidelines Exist		

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

NOTES

- 1 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 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 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)	0:08 - 0:13	0:14	0:08 - 0:14	0:05 - 0:08	0:07 - 0:10	0:03 - 0:05	0:02 - 0:04	
below -3 to -6°C (below 27 to 21°F)	0:06 - 0:10	0:11	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	0:05 - 0:08	0:03 - 0:05	0:03 - 0:05	0:02 - 0:04		CAUTION: No holdover time guidelines exist
below -10°C (below 14°F)	0:04 - 0:07	0:05	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 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.

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 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)	0:07 - 0:12	0:09	0:05 - 0:09	0:02 - 0:05	0:06 - 0:10	0:03 - 0:05	0:01 - 0:04	
below -3 to -6°C (below 27 to 21°F)	0:05 - 0:06	0:08	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	0:04 - 0:07	0:02 - 0:04	0:03 - 0:05	0:02 - 0:04		CAUTION: No holdover time guidelines exist
below -10°C (below 14°F)	0:03 - 0:05	0:05	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 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.

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 or Ice Crystals	Snow, Snow Grains or Snow Pellets ^{2,3}	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-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	0:06 - 0:34	
	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 - 0:49	0:15 - 0:27	0:15 - 0:34	0:11 - 0:15		CAUTION: No holdover time guidelines exist
	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 - 0:49	0:11 - 0:23	0:15 - 0:34 ⁷	0:11 - 0:15 ⁷		
	75/25	0:19 - 0:38	0:06 - 0:15	0:11 - 0:19 ⁷	0:06 - 0:11 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:11 - 0:27	0:05 - 0:15				
below -18 to -25°C (below 0 to -13°F)	100/0	0:11 - 0:27 ⁸	0:02 - 0:07 ⁸				
below -25°C to LOUT (below -13°F to LOUT)	100/0	0:11 - 0:27 ⁸	0:01 - 0:05 ⁸				

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 No holdover time guidelines exist for this condition below -10°C (14°F).
- 8 If the LOUT is unknown, no holdover time guidelines exist below -24°C (-11°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 26**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3 °C and above (27 °F and above)	100/0	1:05 - 1:58	1:12	0:46 - 1:12	0:30 - 0:46	0:38 - 1:12	0:30 - 0:38	0:15 - 1:05	CAUTION: No holdover time guidelines exist
	75/25	0:49 - 1:27	1:01	0:30 - 1:01	0:15 - 0:30	0:34 - 0:49	0:19 - 0:27	0:08 - 0:46	
	50/50	0:23 - 0:34	0:30	0:15 - 0:30	0:05 - 0:15	0:11 - 0:19	0:06 - 0:08		
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:34 - 1:43	1:08	0:42 - 1:08	0:27 - 0:42	0:23 - 0:53	0:11 - 0:27		CAUTION: No holdover time guidelines exist
	75/25	0:27 - 0:57	0:49	0:27 - 0:49	0:15 - 0:27	0:15 - 0:38	0:11 - 0:19		
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:34 - 1:43	1:05	0:42 - 1:05	0:27 - 0:42	0:23 - 0:53 ⁷	0:11 - 0:27 ⁷		CAUTION: No holdover time guidelines exist
	75/25	0:27 - 0:57	0:42	0:23 - 0:42	0:11 - 0:23	0:15 - 0:38 ⁷	0:11 - 0:19 ⁷		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:19 - 0:34	0:30	0:15 - 0:30	0:05 - 0:15				
below -18 to -25°C (below 0 to -13°F)	100/0	0:19 - 0:34	0:15	0:07 - 0:15	0:02 - 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 II fluid cannot be used.
- 2 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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
ABAX ECOWING AD-2**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	1:01 - 2:17	1:50	0:57 - 1:50	0:30 - 0:57	0:30 - 1:16	0:23 - 0:34	0:07 - 1:05	
	75/25	0:57 - 1:05	1:20	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	0:11 - 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	0:46 - 1:31	0:23 - 0:46	0:19 - 0:53	0:15 - 0:23		CAUTION: No holdover time guidelines exist
	75/25	0:27 - 1:27	1:16	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	0:42 - 1:20	0:23 - 0:42	0:19 - 0:53 ⁷	0:15 - 0:23 ⁷		
	75/25	0:27 - 1:27	1:12	0:38 - 1:12	0:19 - 0:38	0:11 - 0:42 ⁷	0:15 - 0:27 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:11 - 0:30	0:30	0:15 - 0:30	0:05 - 0:15				
below -18 to -25°C (below 0 to -13°F)	100/0	0:11 - 0:30	0:15	0:07 - 0:15	0:02 - 0:07				
below -25 to -27°C (below -13 to -17°F)	100/0	0:11 - 0:30	0:15	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 II fluid cannot be used.
- 2 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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
AVIATION SHAANXI HI-TECH CLEANWING II**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Snow, Snow Grains or Snow Pellets ^{2,3}	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3 °C and above (27 °F and above)	100/0	0:42 - 1:24	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	0:19 - 0:34	0:27 - 0:46	0:15 - 0:23	0:05 - 0:38	
	50/50	0:27 - 0:46	0:11 - 0:23	0:15 - 0:30	0:08 - 0:15		
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:34 - 1:24	0:23 - 0:42	0:23 - 0:42	0:15 - 0:19		CAUTION: No holdover time guidelines exist
	75/25	0:30 - 1:20	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	0:23 - 0:42	0:23 - 0:42 ⁷	0:15 - 0:19 ⁷		CAUTION: No holdover time guidelines exist
	75/25	0:30 - 1:20	0:19 - 0:34	0:27 - 0:30 ⁷	0:15 - 0:19 ⁷		
below -14 to -18 °C (below 7 to 0 °F)	100/0	0:15 - 0:38	0:05 - 0:15				
below -18 to -25°C (below 0 to -13°F)	100/0	0:15 - 0:38	0:02 - 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 II fluid cannot be used.
- 2 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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
BEIJING YADILITE AVIATION YD-102 TYPE II**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	0:53 - 1:31	1:16	0:38 - 1:16	0:19 - 0:38	0:30 - 0:57	0:27 - 0:30	0:08 - 0:46	
	75/25	0:19 - 0:42	0:38	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	0:08 - 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	0:27 - 0:57	0:15 - 0:27	0:27 - 0:38	0:19 - 0:19		
	75/25	0:23 - 0:38	0:30	0:15 - 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	0:23 - 0:46	0:11 - 0:23	0:27 - 0:38 ⁷	0:19 - 0:19 ⁷		
	75/25	0:23 - 0:38	0:27	0:15 - 0:27	0:06 - 0:15	0:11 - 0:19 ⁷	0:07 - 0:11 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:15 - 0:34	0:30	0:15 - 0:30	0:05 - 0:15				
below -18 to -25°C (below 0 to -13°F)	100/0	0:15 - 0:34	0:15	0:07 - 0:15	0:02 - 0:07				
below -25 to -29°C (below -13 to -20°F)	100/0	0:15 - 0:34	0:15	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 II fluid cannot be used.
- 2 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:40 - 3:02	1:58	1:12 - 1:58	0:46 - 1:12	1:01 - 1:31	0:34 - 1:05	0:08 - 1:08	
	75/25	1:24 - 2:05	1:58	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	0:19 - 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	0:57 - 1:35	0:34 - 0:57	0:27 - 1:08	0:19 - 0:34		CAUTION: No holdover time guidelines exist
	75/25	0:19 - 0:49	1:20	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	0:49 - 1:24	0:30 - 0:49	0:27 - 1:08 ⁷	0:19 - 0:34 ⁷		
	75/25	0:19 - 0:49	1:01	0:30 - 1:01	0:15 - 0:30	0:19 - 0:53 ⁷	0:15 - 0:27 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:23 - 0:38	0:53	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	0:08 - 0:23	0:02 - 0:08				
below -25 to -29°C (below -13 to -20°F)	100/0	0:23 - 0:38	0:15	0:05 - 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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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
CLARIANT SAFEWING MP II FLIGHT PLUS**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Snow, Snow Grains or Snow Pellets ^{2,3}	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:02 - 3:02	0:38 - 1:24	1:05 - 1:31	0:34 - 0:46	0:11 - 1:31	
	75/25	1:58 - 3:02	0:46 - 1:20	1:12 - 1:31	0:38 - 0:57	0:11 - 0:57	
	50/50	0:49 - 1:46	0:11 - 0:19	0:23 - 0:49	0:11 - 0:15		
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		CAUTION: No holdover time guidelines exist
	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 ⁷	0:27 - 0:42 ⁷		
	75/25	0:23 - 1:20	0:42 - 1:16	0:19 - 0:53 ⁷	0:23 - 0:34 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:15 - 0:30	0:05 - 0:15				
below -18 to -25°C (below 0 to -13°F)	100/0	0:15 - 0:30	0:02 - 0:07				
below -25 to -29°C (below -13 to -20°F)	100/0	0:15 - 0:30	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 II fluid cannot be used.
- 2 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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
CRYOTECH POLAR GUARD® II**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:09 - 3:02	2:00	1:27 - 2:00	0:49 - 1:27	1:12 - 1:31	0:57 - 1:08	0:11 - 1:31	
	75/25	1:54 - 3:02	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	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	1:05 - 1:50	0:38 - 1:05	0:27 - 1:12	0:27 - 0:34		
	75/25	0:30 - 1:08	1:46	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	0:53 - 1:31	0:30 - 0:53	0:27 - 1:12 ⁷	0:27 - 0:34 ⁷		
	75/25	0:30 - 1:08	1:31	0:42 - 1:31	0:19 - 0:42	0:19 - 0:49 ⁷	0:27 - 0:34 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:19 - 0:38	1:12	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	0:11 - 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	0:06 - 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 II fluid cannot be used.
- 2 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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 or Ice Crystals	Snow, Snow Grains or Snow Pellets ^{2,3}	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	1:43 - 2:51	0:46 - 1:16	1:24 - 1:31	0:46 - 1:05	0:15 - 1:31	
	75/25	1:16 - 1:54	0:27 - 0:53	1:05 - 1:31	0:38 - 0:53	0:11 - 1:31	
	50/50	0:27 - 0:49	0:05 - 0:11	0:15 - 0:23	0:08 - 0:11		
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		CAUTION: No holdover time guidelines exist
	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 ⁷	0:11 - 0:27 ⁷		
	75/25	0:19 - 1:05	0:27 - 0:49	0:15 - 0:42 ⁷	0:07 - 0:23 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:23 - 0:42	0:05 - 0:15				
below -18 to -25°C (below 0 to -13°F)	100/0	0:23 - 0:42	0:02 - 0:07				
below -25 to -29°C (below -13 to -20°F)	100/0	0:23 - 0:42	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 II fluid cannot be used.
- 2 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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
KILFROST ICE CLEAR II**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶	
-3 °C and above (27 °F and above)	100/0	0:49 - 1:31	1:31	0:49 - 1:31	0:27 - 0:49	0:27 - 0:46	0:19 - 0:30	0:08 - 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	N/A		
below -3 to -8 °C (below 27 to 18 °F)	100/0	0:42 - 1:27	1:20	0:42 - 1:20	0:23 - 0:42	0:30 - 0:46	0:19 - 0:23	CAUTION: No holdover time guidelines exist		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A			
below -8 to -14 °C (below 18 to 7 °F)	100/0	0:42 - 1:27	1:16	0:42 - 1:16	0:23 - 0:42	0:30 - 0:46 ⁷	0:19 - 0:23 ⁷			
	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	0:30	0:15 - 0:30	0:05 - 0:15					
below -18 to -24°C (below 0 to -11°F)	100/0	0:23 - 0:42	0:15	0:07 - 0:15	0:02 - 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 II fluid cannot be used.
- 2 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Snow, Snow Grains or Snow Pellets ^{2,3}	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-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		CAUTION: No holdover time guidelines exist
	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 ⁷	0:11 - 0:15 ⁷		CAUTION: No holdover time guidelines exist
	75/25	0:23 - 0:49	0:08 - 0:15	0:11 - 0:23 ⁷	0:06 - 0:11 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:19 - 0:27	0:05 - 0:15				
below -18 to -25°C (below 0 to -13°F)	100/0	0:19 - 0:27	0:02 - 0:07				
below -25 to -28°C (below -13 to -18°F)	100/0	0:19 - 0:27	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 II fluid cannot be used.
- 2 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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
NEWAVE AEROCHEMICAL FCY-2 BIO+**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	1:05 - 1:54	1:46	0:49 - 1:46	0:23 - 0:49	0:38 - 1:01	0:19 - 0:34	0:06 - 0:57	
	75/25	0:34 - 1:01	1:01	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	0:11 - 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	0:30 - 1:05	0:15 - 0:30	0:27 - 0:49	0:11 - 0:23		CAUTION: No holdover time guidelines exist
	75/25	0:23 - 0:49	0:38	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	0:23 - 0:46	0:11 - 0:23	0:27 - 0:49 ⁷	0:11 - 0:23 ⁷		
	75/25	0:23 - 0:49	0:27	0:15 - 0:27	0:06 - 0:15	0:15 - 0:27 ⁷	0:11 - 0:15 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:15 - 0:46	0:30	0:15 - 0:30	0:05 - 0:15				
below -18 to -25°C (below 0 to -13°F)	100/0	0:15 - 0:46	0:15	0:07 - 0:15	0:02 - 0:07				
below -25 to -28.5°C (below -13 to -19°F)	100/0	0:15 - 0:46	0:15	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 II fluid cannot be used.
- 2 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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
OKSAYD DEFROST PG 2**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	0:42 - 1:24	1:24	0:42 - 1:24	0:23 - 0:42	0:23 - 0:46	0:15 - 0:27	0:08 - 1:01	
	75/25	0:49 - 1:31	1:20	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	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	0:34 - 1:05	0:19 - 0:34	0:27 - 0:38	0:15 - 0:23		CAUTION: No holdover time guidelines exist
	75/25	0:30 - 1:01	0:53	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	0:30 - 0:57	0:15 - 0:30	0:27 - 0:38 ⁷	0:15 - 0:23 ⁷		
	75/25	0:30 - 1:01	0:42	0:19 - 0:42	0:08 - 0:19	0:19 - 0:30 ⁷	0:11 - 0:15 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:27 - 0:49	0:30	0:15 - 0:30	0:05 - 0:15				
below -18 to -25°C (below 0 to -13°F)	100/0	0:27 - 0:49	0:15	0:07 - 0:15	0:02 - 0:07				
below -25 to -27°C (below -13 to -17°F)	100/0	0:27 - 0:49	0:15	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 II fluid cannot be used.
- 2 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- 7 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 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	0:34 - 1:27	1:01	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	N/A	
below -3 to -10°C (below 27 to 14°F)	100/0	0:38 - 1:16	1:01	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	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 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.

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 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	0:34 - 1:27	1:01	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	N/A	
below -3 to -10°C (below 27 to 14°F)	100/0	0:38 - 1:16	1:01	0:30 - 1:01	0:14 - 0:30	0:19 - 0:34	0:11 - 0:19		CAUTION: No holdover time guidelines exist
	75/25	N/A	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	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	0:15 - 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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 4 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 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-38 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 or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	0:57 - 2:02	1:46	0:53 - 1:46	0:27 - 0:53	0:30 - 1:08	0:19 - 0:30	0:06 - 0:53	
	75/25	1:05 - 2:02	1:35	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	0:19 - 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	1:24	0:42 - 1:24	0:23 - 0:42	0:19 - 1:01	0:15 - 0:19		
	75/25	0:23 - 1:01	1:24	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	0:34 - 1:01	0:19 - 0:34	0:19 - 1:01 ⁷	0:15 - 0:19 ⁷		
	75/25	0:23 - 1:01	1:16	0:34 - 1:16	0:15 - 0:34	0:15 - 0:49 ⁷	0:11 - 0:19 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:15 - 0:30	0:30	0:15 - 0:30	0:05 - 0:15				
below -18 to -25°C (below 0 to -13°F)	100/0	0:15 - 0:30 ⁸	0:15 ⁸	0:07 - 0:15 ⁸	0:02 - 0:07 ⁸				
below -25°C to LOUT (below -13°F to LOUT)	100/0	0:15 - 0:30 ⁸	0:15 ⁸	0:05 - 0:15 ⁸	0:01 - 0:05 ⁸				

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 No holdover time guidelines exist for this condition below -10°C (14°F).
- 8 If the LOUT is unknown, no holdover time guidelines exist below -22.5°C (-8.5°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 or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶		
-3°C and above (27°F and above)	100/0	2:32 - 3:02	2:00	1:27 - 2:00	0:46 - 1:27	1:05 - 1:31	0:46 - 1:05	0:08 - 1:27			
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
below -3 to -8°C (below 27 to 18°F)	100/0	0:15 - 1:12	2:00	1:08 - 2:00	0:34 - 1:08	0:19 - 1:05	0:15 - 0:19	CAUTION: No holdover time guidelines exist			
	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	0:57 - 1:50	0:30 - 0:57	0:19 - 1:05 ⁷	0:15 - 0:19 ⁷				
	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	0:30	0:15 - 0:30	0:05 - 0:15						
below -18 to -25°C (below 0 to -13°F)	100/0	0:19 - 0:30	0:15	0:07 - 0:15	0:02 - 0:07						
below -25 to -26°C (below -13 to -15°F)	100/0	0:19 - 0:30	0:15	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 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
CHEMCO CHEMR EG IV**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	1:35 - 2:43	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	N/A	
below -3 to -8°C (below 27 to 18°F)	100/0	1:05 - 2:47	2:00	0:57 - 2:00	0:27 - 0:57	0:46 - 1:12	0:27 - 0:38		CAUTION: No holdover time guidelines exist
	75/25	N/A	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	0:57 - 2:00	0:27 - 0:57	0:46 - 1:12 ⁷	0:27 - 0:38 ⁷		CAUTION: No holdover time guidelines exist
	75/25	N/A	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	0:30	0:23 - 0:30	0:11 - 0:23				
below -18 to -25°C (below 0 to -13°F)	100/0	0:30 - 1:05	0:30	0:23 - 0:30	0:11 - 0:23				
below -25 to -27°C (below -13 to -17°F)	100/0	0:30 - 1:05	0:30	0:23 - 0:30	0:11 - 0:23				

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 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
CLARIANT MAX FLIGHT 04**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:02 - 3:02	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	N/A	
below -3 to -8°C (below 27 to 18°F)	100/0	0:38 - 1:54	2:00	1:16 - 2:00	0:38 - 1:16	0:19 - 1:08	0:15 - 0:30		CAUTION: No holdover time guidelines exist
	75/25	N/A	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	0:53 - 1:46	0:27 - 0:53	0:19 - 1:08 ⁷	0:15 - 0:30 ⁷		CAUTION: No holdover time guidelines exist
	75/25	N/A	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	0:30	0:15 - 0:30	0:05 - 0:15				
below -18 to -23.5°C (below 0 to -10°F)	100/0	0:15 - 0:34	0:15	0:07 - 0:15	0:02 - 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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 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
CLARIANT MAX FLIGHT AVIA**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:21 - 3:02	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	N/A	
below -3 to -8°C (below 27 to 18°F)	100/0	1:20 - 2:59	1:54	1:05 - 1:54	0:38 - 1:05	0:53 - 1:31	0:42 - 1:08		CAUTION: No holdover time guidelines exist
	75/25	N/A	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	0:57 - 1:39	0:30 - 0:57	0:53 - 1:31 ⁷	0:42 - 1:08 ⁷		CAUTION: No holdover time guidelines exist
	75/25	N/A	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	0:30	0:23 - 0:30	0:11 - 0:23				
below -18 to -25°C (below 0 to -13°F)	100/0	0:27 - 1:05	0:30	0:23 - 0:30	0:11 - 0:23				
below -25 to -28.5°C (below -13 to -19°F)	100/0	0:27 - 1:05	0:30	0:23 - 0:30	0:11 - 0:23				

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 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
CLARIANT MAX FLIGHT SNEG**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	1:50 - 3:02	2:00	1:16 - 2:00	0:42 - 1:16	1:31 - 1:31	0:38 - 1:16	0:15 - 1:08	
	75/25	3:02 - 3:02	1:50	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	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	1:01 - 1:50	0:34 - 1:01	0:23 - 1:05	0:19 - 0:30		
	75/25	0:23 - 1:05	1:27	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	0:53 - 1:35	0:30 - 0:53	0:23 - 1:05 ⁷	0:19 - 0:30 ⁷		
	75/25	0:23 - 1:05	1:16	0:46 - 1:16	0:30 - 0:46	0:15 - 0:49 ⁷	0:15 - 0:30 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:15 - 0:38	0:30	0:15 - 0:30	0:05 - 0:15				
below -18 to -25°C (below 0 to -13°F)	100/0	0:15 - 0:38	0:15	0:07 - 0:15	0:02 - 0:07				
below -25 to -29°C (below -13 to -20°F)	100/0	0:15 - 0:38	0:15	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 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
CLARIANT SAFEWING EG IV NORTH**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶	
-3°C and above (27°F and above)	100/0	1:46 - 2:59	2:00	1:16 - 2:00	0:38 - 1:16	1:08 - 1:31	0:38 - 0:42	0:06 - 1:31		
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
below -3 to -8°C (below 27 to 18°F)	100/0	1:20 - 3:02	2:00	1:08 - 2:00	0:38 - 1:08	0:49 - 1:24	0:42 - 1:05	CAUTION: No holdover time guidelines exist		
	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	1:08 - 2:00	0:38 - 1:08	0:49 - 1:24 ⁷	0:42 - 1:05 ⁷			
	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	0:30	0:23 - 0:30	0:11 - 0:23					
below -18 to -25°C (below 0 to -13°F)	100/0	0:30 - 1:01	0:30	0:23 - 0:30	0:11 - 0:23					
below -25 to -30°C (below -13 to -22°F)	100/0	0:30 - 1:01	0:30	0:23 - 0:30	0:11 - 0:23					

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 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
CLARIANT SAFEWING MP IV LAUNCH**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	3:02 - 3:02	2:00	1:20 - 2:00	0:49 - 1:20	1:08 - 1:31	0:46 - 1:16	0:11 - 1:16	
	75/25	2:47 - 3:02	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	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	1:08 - 1:50	0:42 - 1:08	0:27 - 1:16	0:19 - 0:34		CAUTION: No holdover time guidelines exist
	75/25	0:30 - 1:01	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	1:01 - 1:39	0:38 - 1:01	0:27 - 1:16 ⁷	0:19 - 0:34 ⁷		
	75/25	0:30 - 1:01	1:50	1:05 - 1:50	0:34 - 1:05	0:19 - 0:53 ⁷	0:19 - 0:34 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:23 - 0:38	0:57	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	0:07 - 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	0:05 - 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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 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
CLARIANT SAFEWING MP IV LAUNCH PLUS**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:59 - 3:02	2:00	1:35 - 2:00	0:42 - 1:35	1:31 - 1:31	0:46 - 1:31	0:15 - 1:31	
	75/25	2:59 - 3:02	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	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	1:16 - 2:00	0:34 - 1:16	0:19 - 1:12	0:19 - 0:30		
	75/25	0:30 - 1:31	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	1:05 - 2:00	0:30 - 1:05	0:19 - 1:12 ⁷	0:19 - 0:30 ⁷		
	75/25	0:30 - 1:31	2:00	0:57 - 2:00	0:23 - 0:57	0:15 - 0:49 ⁷	0:15 - 0:23 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:19 - 0:38	0:57	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	0:07 - 0:23	0:02 - 0:07				
below -25 to -29°C (below -13 to -20°F)	100/0	0:19 - 0:38	0:15	0:05 - 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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 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
CRYOTECH POLAR GUARD® ADVANCE**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:09 - 3:02	2:00	1:27 - 2:00	0:49 - 1:27	1:12 - 1:31	0:57 - 1:08	0:11 - 1:31	
	75/25	1:54 - 3:02	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	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	1:05 - 1:50	0:38 - 1:05	0:27 - 1:12	0:27 - 0:34		
	75/25	0:30 - 1:08	1:46	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	0:53 - 1:31	0:30 - 0:53	0:27 - 1:12 ⁷	0:27 - 0:34 ⁷		
	75/25	0:30 - 1:08	1:31	0:42 - 1:31	0:19 - 0:42	0:19 - 0:49 ⁷	0:27 - 0:34 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:19 - 0:38	1:12	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	0:11 - 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	0:06 - 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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 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
DOW CHEMICAL UCAR™ ENDURANCE EG106**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶		
-3°C and above (27°F and above)	100/0	1:35 - 2:24	2:00	1:01 - 2:00	0:30 - 1:01	0:53 - 1:31	0:38 - 0:57	0:15 - 1:31			
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
below -3 to -8°C (below 27 to 18°F)	100/0	1:24 - 2:32	1:50	0:53 - 1:50	0:27 - 0:53	0:42 - 1:24	0:34 - 0:53	CAUTION: No holdover time guidelines exist			
	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	0:49 - 1:39	0:23 - 0:49	0:42 - 1:24 ⁷	0:34 - 0:53 ⁷				
	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	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	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	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 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
DOW CHEMICAL UCAR™ FLIGHTGUARD AD-49**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶		
-3°C and above (27°F and above)	100/0	2:32 - 3:02	2:00	1:27 - 2:00	0:46 - 1:27	1:05 - 1:31	0:46 - 1:05	0:08 - 1:27			
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
below -3 to -8°C (below 27 to 18°F)	100/0	0:15 - 1:12	2:00	1:08 - 2:00	0:34 - 1:08	0:19 - 1:05	0:15 - 0:19	CAUTION: No holdover time guidelines exist			
	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	0:57 - 1:50	0:30 - 0:57	0:19 - 1:05 ⁷	0:15 - 0:19 ⁷				
	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	0:30	0:15 - 0:30	0:05 - 0:15						
below -18 to -25°C (below 0 to -13°F)	100/0	0:19 - 0:30	0:15	0:07 - 0:15	0:02 - 0:07						
below -25 to -26°C (below -13 to -15°F)	100/0	0:19 - 0:30	0:15	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 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
INLAND TECHNOLOGIES ECO-SHIELD®**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶		
-3°C and above (27°F and above)	100/0	0:57 - 2:02	1:50	1:01 - 1:50	0:34 - 1:01	0:30 - 1:08	0:27 - 0:30	0:11 - 1:12			
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
below -3 to -8°C (below 27 to 18°F)	100/0	0:53 - 1:58	1:35	0:53 - 1:35	0:30 - 0:53	0:38 - 1:05	0:23 - 0:30	CAUTION: No holdover time guidelines exist			
	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	0:49 - 1:27	0:27 - 0:49	0:38 - 1:05 ⁷	0:23 - 0:30 ⁷				
	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	0:30	0:15 - 0:30	0:05 - 0:15						
below -18 to -25°C (below 0 to -13°F)	100/0	0:23 - 0:46	0:15	0:07 - 0:15	0:02 - 0:07						
below -25 to -25.5°C (below -13 to -14°F)	100/0	0:23 - 0:46	0:15	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 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
KILFROST ABC-S PLUS**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	1:39 - 3:02	2:00	1:35 - 2:00	0:57 - 1:35	1:24 - 1:31	0:49 - 1:31	0:19 - 1:31	
	75/25	1:05 - 2:02	1:35	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	0:23 - 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	1:24 - 2:00	0:49 - 1:24	0:19 - 1:12	0:15 - 0:23		CAUTION: No holdover time guidelines exist
	75/25	0:34 - 1:24	1:24	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	1:20 - 2:00	0:46 - 1:20	0:19 - 1:12 ⁷	0:15 - 0:23 ⁷		
	75/25	0:34 - 1:24	1:20	0:46 - 1:20	0:27 - 0:46	0:15 - 0:53 ⁷	0:11 - 0:19 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:30 - 0:46	0:30	0:15 - 0:30	0:05 - 0:15				
below -18 to -25°C (below 0 to -13°F)	100/0	0:30 - 0:46	0:15	0:07 - 0:15	0:02 - 0:07				
below -25 to -28°C (below -13 to -18°F)	100/0	0:30 - 0:46	0:15	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 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
LNT SOLUTIONS E450**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	1:24 - 2:13	1:50	1:12 - 1:50	0:46 - 1:12	1:12 - 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	N/A	
below -3 to -8°C (below 27 to 18°F)	100/0	1:08 - 2:59	1:35	1:01 - 1:35	0:38 - 1:01	1:20 - 1:31	0:49 - 1:16		CAUTION: No holdover time guidelines exist
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
below -8 to -14°C (below 18 to 7°F)	100/0	1:08 - 2:59	1:24	0:53 - 1:24	0:34 - 0:53	1:20 - 1:31 ⁷	0:49 - 1:16 ⁷		CAUTION: No holdover time guidelines exist
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
below -14 to -18°C (below 7 to 0°F)	100/0	0:27 - 0:49	2:00	0:49 - 2:00	0:15 - 0:49				
below -18 to -22.5°C (below 0 to -9°F)	100/0	0:27 - 0:49	1:31	0:30 - 1:31	0:11 - 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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 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
NEWAVE AEROCHEMICAL FCY 9311**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶		
-3°C and above (27°F and above)	100/0	1:27 - 3:02	1:46	0:53 - 1:46	0:27 - 0:53	0:53 - 1:31	0:30 - 0:49	0:11 - 1:05			
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
below -3 to -8°C (below 27 to 18°F)	100/0	0:27 - 1:35	1:24	0:42 - 1:24	0:23 - 0:42	0:27 - 1:01	0:15 - 0:27	CAUTION: No holdover time guidelines exist			
	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	0:38 - 1:12	0:19 - 0:38	0:27 - 1:01 ⁷	0:15 - 0:27 ⁷				
	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	0:30	0:15 - 0:30	0:05 - 0:15						
below -18 to -25°C (below 0 to -13°F)	100/0	0:23 - 0:42	0:15	0:07 - 0:15	0:02 - 0:07						
below -25 to -29.5°C (below -13 to -21°F)	100/0	0:23 - 0:42	0:15	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 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
OKSAYD DEFROST ECO 4**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶		
-3°C and above (27°F and above)	100/0	1:08 - 2:02	1:54	0:57 - 1:54	0:27 - 0:57	0:49 - 1:08	0:30 - 0:49	0:11 - 0:53			
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
below -3 to -8°C (below 27 to 18°F)	100/0	0:42 - 1:58	1:43	0:49 - 1:43	0:27 - 0:49	0:38 - 1:01	0:27 - 0:38	CAUTION: No holdover time guidelines exist			
	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	0:46 - 1:35	0:23 - 0:46	0:38 - 1:01 ⁷	0:27 - 0:38 ⁷				
	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	0:30	0:15 - 0:30	0:05 - 0:15						
below -18 to -25°C (below 0 to -13°F)	100/0	0:23 - 0:38	0:15	0:07 - 0:15	0:02 - 0:07						
below -25 to -25.5°C (below -13 to -14°F)	100/0	0:23 - 0:38	0:15	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 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
OKSAYD DEFROST EG 4**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶		
-3°C and above (27°F and above)	100/0	2:05 - 3:02	2:00	1:50 - 2:00	1:05 - 1:50	1:31 - 1:31	0:46 - 1:20	0:15 - 1:31			
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
below -3 to -8°C (below 27 to 18°F)	100/0	1:46 - 3:02	2:00	1:35 - 2:00	0:57 - 1:35	0:46 - 1:31	1:01 - 1:24	CAUTION: No holdover time guidelines exist			
	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	1:27 - 2:00	0:53 - 1:27	0:46 - 1:31 ⁷	1:01 - 1:24 ⁷				
	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	0:30	0:23 - 0:30	0:11 - 0:23						
below -18 to -25°C (below 0 to -13°F)	100/0	0:34 - 1:50	0:30	0:23 - 0:30	0:11 - 0:23						
below -25 to -26°C (below -13 to -15°F)	100/0	0:34 - 1:50	0:30	0:23 - 0:30	0:11 - 0:23						

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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 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
SHAANXI CLEANWAY AVIATION CLEANSURFACE IV**

Outside Air Temperature ¹	Fluid Concentration Fluid/Water By % Volume	Freezing Fog or Ice Crystals	Very Light Snow, Snow Grains or Snow Pellets ^{2,3}	Light Snow, Snow Grains or Snow Pellets ^{2,3}	Moderate Snow, Snow Grains or Snow Pellets ²	Freezing Drizzle ⁴	Light Freezing Rain	Rain on Cold Soaked Wing ⁵	Other ⁶
-3°C and above (27°F and above)	100/0	2:09 - 3:02	2:00	1:27 - 2:00	0:46 - 1:27	1:31 - 1:31	1:05 - 1:08	0:11 - 1:31	
	75/25	1:58 - 3:02	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	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	0:49 - 1:31	0:27 - 0:49	0:27 - 1:20	0:15 - 0:27		
	75/25	0:38 - 1:27	1:43	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	0:34 - 1:01	0:19 - 0:34	0:27 - 1:20 ⁷	0:15 - 0:27 ⁷		
	75/25	0:38 - 1:27	1:16	0:34 - 1:16	0:15 - 0:34	0:23 - 1:01 ⁷	0:19 - 0:30 ⁷		
below -14 to -18°C (below 7 to 0°F)	100/0	0:23 - 0:38	0:30	0:15 - 0:30	0:05 - 0:15				
below -18 to -25°C (below 0 to -13°F)	100/0	0:23 - 0:38	0:15	0:07 - 0:15	0:02 - 0:07				
below -25 to -28.5°C (below -13 to -19°F)	100/0	0:23 - 0:38	0:15	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 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 40) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0°C (32°F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table ADJ-39 provides allowance times for ice pellets and small hail).
- 7 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 ALLOWANCE TIMES FOR SAE TYPE III FLUIDS¹

Precipitation Type	Outside Air Temperature		
	-5°C and above	Below -5 to -10°C	Below -10°C ²
Light Ice Pellets	8 minutes	8 minutes	Caution: No allowance times currently exist
Light Ice Pellets Mixed with Snow	8 minutes	8 minutes	
Light Ice Pellets Mixed with Freezing Drizzle	5 minutes	4 minutes	
Light Ice Pellets Mixed with Freezing Rain	5 minutes	4 minutes	
Light Ice Pellets Mixed with Rain	5 minutes ³		
Moderate Ice Pellets (or Small Hail) ⁴	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 below 0°C; consider use of light ice pellets mixed with freezing rain.
- 4 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 snow is reported, use the "light ice pellets mixed with 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: freezing drizzle, freezing rain or rain.

TABLE ADJ-39: ADJUSTED ALLOWANCE TIMES FOR SAE TYPE IV FLUIDS¹

Precipitation Type	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	38 minutes	23 minutes	23 minutes ³	23 minutes ³
Light Ice Pellets Mixed with Snow	30 minutes	11 minutes	11 minutes ³	
Light Ice Pellets Mixed with Freezing Drizzle	19 minutes	8 minutes		Caution: No allowance times currently exist
Light Ice Pellets Mixed with Freezing Rain	19 minutes	8 minutes		
Light Ice Pellets Mixed with Rain	19 minutes ⁴			
Moderate Ice Pellets (or Small Hail) ⁵	19 minutes ⁶	8 minutes	8 minutes ³	8 minutes ⁷
Moderate Ice Pellets (or Small Hail) ⁵ Mixed with Freezing Drizzle	8 minutes	5 minutes		Caution: No allowance times currently exist
Moderate Ice Pellets (or Small Hail) ⁵ Mixed with Rain	8 minutes ⁸			

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 on aircraft with rotation speeds of 100 knots or greater. All Type IV fluids are propylene glycol based with the exception of CHEMCO ChemR EG IV, Clariant Max Flight AVIA, Clariant Safewing EG IV NORTH, Dow EG106, LNT Solutions E450 and Oksayd Defrost EG 4, which are ethylene glycol based.
- 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. (For these aircraft, if the fluid type is not known, assume zero allowance time.)
- 4 No allowance times exist in this condition for temperatures below 0°C; consider use of light ice pellets mixed with freezing rain.
- 5 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 snow is reported, use the "light ice pellets mixed with snow" allowance times.
- 6 Allowance time is 14 minutes for propylene glycol (PG) fluids or when the fluid type is unknown.
- 7 No allowance times exist for propylene glycol (PG) fluids in this condition for temperatures below -16°C.
- 8 No allowance times exist in this condition for temperatures below 0°C.

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: freezing drizzle, freezing rain or 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 ARP5485 and ARP5945).
- **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).