

FAA HOLDOVER TIME REGRESSION INFORMATION



WINTER 2016-2017
ORIGINAL ISSUE: AUG. 5, 2016

The content of this document is the official FAA winter 2016-2017 holdover time regression information.

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

Questions on the technical content of the holdover time tables or regression information should be addressed to warren.underwood@faa.gov or 404-305-6652.

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

CHANGE CONTROL RECORDS

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

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

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

SUMMARY OF CHANGES FROM PREVIOUS YEAR

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

Type I Fluid

- The Type I regression coefficients are unchanged.

Type II Fluid

- A regression coefficients table and verification table have been added for Beijing Yadilite Aviation YD-102 Type II, a new Type II fluid added to the holdover time (HOT) guidelines for winter 2016-2017.
- LNT Solutions P250 was removed from the HOT guidelines for winter 2016-2017. Correspondingly, the regression coefficients table and verification table for this fluid have been removed from this document.
- Several changes were made to the Type II generic holdover times for winter 2016-2017. The Type II generic verification table has been updated accordingly.
- All Type II and Type IV snow holdover times in the “below -14°C to LOU” row were reduced for winter 2016-2017. The associated regression coefficients have been updated.

Type III Fluid

- Supplemental testing with AllClear AeroClear MAX resulted in changes to its holdover times and corresponding regression coefficients for winter 2016-2017. Its regression coefficients tables, verification tables and LUPRs have been updated correspondingly.

Type IV Fluid

- Regression coefficients tables and verification tables have been added for the three new Type IV fluids added to the HOT guidelines for winter 2016-2017: Clariant Max Flight AVIA, Clariant Safewing EG IV NORTH and Shaanxi Cleanway Aviation Cleansurface IV.
- The Cryotech Polar Guard and Dow UCAR FlightGuard AD-480 fluid-specific HOT tables were removed from the HOT guidelines for winter 2016-2017. Correspondingly, the regression coefficients tables and verification tables for these fluids have been removed from this document.
- Supplemental testing with Deicing Solutions ECO-SHIELD® resulted in changes to its holdover times and corresponding regression coefficients for winter 2016-2017. Its regression coefficients tables, verification tables and LUPRs have been updated correspondingly.
- Several changes were made to the Type IV generic holdover times for winter 2016-2017. The Type IV generic verification table has been updated accordingly.
- All Type II and Type IV snow holdover times in the “below -14°C to LOU” row were reduced for winter 2016-2017. The associated regression coefficients have been updated.

Adjusted Holdover Times for Flaps/Slats Deployed Prior to De/Anti-Icing

- In winter 2014-2015, FAA published holdover times adjusted to 90% of the original values to be used when flaps/slats are deployed prior to de/anti-icing. These holdover times will continue to be used in winter 2016-2017. Liquid Water Equivalent Systems (LWES), Holdover Time Determination Systems (HOTDS) and Check-time Determination Systems (CTDS) can use the regression information in this document to calculate holdover times applicable for these types of operations. Applicable guidance for manufacturers is provided in the next section of this document under the heading “Applicability of Regression Coefficients Tables.”

GUIDANCE FOR USING REGRESSION INFORMATION

In recent years, several companies have been developing systems that measure precipitation rate in real-time. These systems, referred to as liquid water equivalent systems (LWES), can be used by check-time determination systems (CTDS) and holdover time determination systems (HOTDS) to calculate more precise holdover times than can be obtained from the holdover time guidelines. They do this using the weather data they collect and the regression information underlying the holdover time guidelines.

As a result of the development of LWES, CTDS and HOTDS, the FAA is making the regression coefficients and equations underlying the holdover time tables available to users. The purpose of this document is to provide the holdover time guidelines regression information for the 2016-2017 holdover time guidelines and to provide guidance on its usage.

The sources of the regression data, along with a history of the publication of regression information, are documented in the Transport Canada report, *Regression Coefficients and Equations Used to Develop the Winter 2016-17 Aircraft Ground Deicing Holdover Time Tables*. This document can be referenced for further information if required.

Use of these systems is authorized through the FAA Advisory Circular (AC) *Use of Liquid Water Equivalent System (LWES) to Determine Holdover Times or Check Times for Anti-icing Fluids* (latest version). For further information contact AFS-220 Ground Deicing Focal Charles J. Enders, phone 202-267-4557, email charles.j.enders@faa.gov.

Interpreting Regression Coefficients Tables

Regression information is provided in this document in a series of regression coefficients tables. Each regression coefficients table shows the regression coefficients and equations that are to be used to calculate holdover times at specific outside air temperatures, under specific precipitation types, with specific fluid dilutions (as applicable for Type II/III/IV fluids).

Each regression coefficients table is presented in the format of its corresponding holdover time table. A footnote is provided at the top of each column to indicate the form of the regression equation for the cells in that column. The regression coefficients required for the equation are given in the corresponding cells below.

The coefficients provided in each table cell are valid only for the conditions (temperature, precipitation type, fluid dilution) of that cell. In cells where no temperature coefficient (coefficient "B") is provided, temperature is not an input into the equation.

Applicability of Regression Coefficients Tables

The Type I generic regression coefficients tables are applicable for all Type I fluids. Fluid-specific regression coefficients tables are available and applicable for Type III fluids and Type IV fluids and for the majority of Type II fluids. If a fluid-specific table is not available for use in calculating fluid-specific holdover times for a Type II or Type IV fluid (currently the case for only one fluid – Kilfrost ABC-3) or if the specific fluid being used is not known, the methodology for calculating Type II or Type IV generic holdover times must be followed (see next page).

To use the regression information provided in this document to obtain holdover times that are valid for operations in which flaps/slats are deployed prior to de/anti-icing: use the regression information applicable to the fluid and weather condition and multiply the result obtained by 90%.

Calculating Type II and Type IV Generic Holdover Times

Generic Type II and Type IV holdover times are used when a flight crew is unaware of the specific fluid that has been used to de/anti-ice their aircraft. The generic values represent the shortest possible holdover time of either all Type II or all Type IV fluids available. The following methodologies must be applied to CTDS/HOTDS programming to enable the systems to determine generic Type II and Type IV holdover times.

Type II: To calculate Type II generic holdover times, the CTDS/HOTDS must be programmed to return the shortest holdover time calculated from the regression information provided for each of the following:

- a) Each Type II fluid on the FAA list of fluids tested for anti-icing performance and aerodynamic acceptance, excluding Kilfrost ABC-3;
- b) The Type II grandfathered fluid data set, and
- c) Each Type IV fluid on the FAA list of fluids tested for anti-icing performance and aerodynamic acceptance (as Type IV fluids also qualify as Type II fluids).

This methodology must also be followed if Kilfrost ABC-3 is being used, as this fluid is not qualified for use with fluid-specific holdover times.

Type IV: To calculate Type IV generic holdover times, the CTDS/HOTDS must be programmed to calculate the holdover time for each Type IV fluid on the FAA list of fluids tested for anti-icing performance and aerodynamic acceptance and return the shortest holdover time calculated. This is the generic Type IV holdover time.

Verification Tables

Verification tables are provided for each of the regression coefficients tables and also for the generic Type II and generic Type IV holdover times. Each verification table provides verification values for select boundary conditions in the associated holdover time table. For Type II, III and IV fluids, the verification tables also include verification values for the lowest usable precipitation rate in snow.

NOTE: CTDS/HOTDS manufacturers may find it useful to use these verification tables as an aid in verifying the implementation of their software algorithms. However, CTDS/HOTDS manufacturers are cautioned that these tables are not all encompassing and that they must develop comprehensive verification and validation methods to ensure the adequacy of their software algorithms.

NOTE: The temperatures used in the verification tables do not respect limitations imposed by fluid lowest operational use temperatures.

Lowest Usable Precipitation Rates in Snow (Table 5)

Natural snow test data for some fluids is not sufficient to support extrapolation of the regression curves to very low rates of precipitation. The lowest usable precipitation rates (LUPRs) in snow have been identified and are included in Table 5 for Type II, III and IV fluids (Type I fluids are not affected). The LUPRs differ by fluid brand, fluid dilution and temperature.

NOTE: At this time LUPRs are provided for snow only; LUPRs are not provided for any other precipitation type. The lowest precipitation rate that can be used in other precipitation types is specified in the FAA LWES AC.

Limitations of Regression Information

Users are cautioned that care must be taken in the application of the regression information. There are a number of rules, exceptions and cautions detailed in this document, the holdover time guidelines, and the FAA LWES AC that must be considered.

Several limitations on the usage of the regression information are listed below.

- The regression coefficients can only be used with liquid water equivalent information that is provided by a CTDS or HOTDS in accordance with the FAA LWES AC.
- Regression equations which include a temperature coefficient cannot be populated with temperature data greater than or equal to 2°C. This is a limitation of the form of the equation. The FAA LWES AC instructs that 0°C be input into the equation when temperature is above 0°C.
- Regression data is developed for specific fluid dilutions. The data cannot be interpolated to determine holdover times for use with dilutions other than the standard 100/0, 75/25 and 50/50 mixtures.
- The regression coefficients are based on best-fit power-law curves and the shape of these curves can result in extreme values outside the precipitation rate limits at which endurance time tests are conducted. Therefore, these values are not necessarily accurate. Caution must therefore be exercised when using the regression equations to calculate holdover times outside of the precipitation rate limits used in the development of holdover time tables, especially at precipitation rates below the lower precipitation rate limit, where the power-law curves give much longer holdover times.
- The lowest precipitation rate to be used as an input to the snow regression equations (this does not apply to other precipitation types) is constrained by the higher of the following:
 1. Minimum demonstrated precipitation measuring equipment rates in accordance with the FAA LWES AC (which shall not be less than 2.0 g/dm²/h); and
 2. Lowest usable precipitation rate (LUPR) for each fluid/dilution/temperature as defined in Table 5 of this document. The LUPR is the lowest precipitation rate for which sufficient outdoor snow data exists to support use of the regression coefficients.
- The highest precipitation rate to be used as an input to the snow regression equations shall be 50 g/dm²/h, as stated in the FAA LWES AC.
- All other lowest and highest precipitation rates to be used as inputs to the regression equations are precipitation type dependent and provided in the FAA LWES AC.
- As regression coefficients and equations are not currently used in the determination of frost holdover times, regression coefficient information is not provided for frost.
- As regression coefficients and equations are not used in the determination of the allowance times provided for ice pellets, small hail and ice pellets mixed with other types of precipitation, regression coefficient information is not provided for allowance times.

REGRESSION INFORMATION TABLES FOR WINTER 2016-2017

Table 1-1	Generic Type I (Aluminum Wing Surfaces) Regression Coefficients Table and Verification Table
Table 1-2	Generic Type I (Composite Wing Surfaces) Regression Coefficients Table and Verification Table
Table 2-1	ABAX Ecowing 26 Regression Coefficients Table and Verification Table
Table 2-2	Aviation Shaanxi Hi-Tech Cleanwing II Regression Coefficients Table and Verification Table
Table 2-3	Beijing Yadilite Aviation YD-102 Type II Regression Coefficients Table and Verification Table
Table 2-4	Clariant Safewing MP II FLIGHT Regression Coefficients Table and Verification Table
Table 2-5	Clariant Safewing MP II FLIGHT PLUS Regression Coefficients Table and Verification Table
Table 2-6	Cryotech Polar Guard® II Regression Coefficients Table and Verification Table
Table 2-7	Kilfrost ABC-Ice Clear II Regression Coefficients Table and Verification Table
Table 2-8	Kilfrost ABC-K Plus Regression Coefficients Table and Verification Table
Table 2-9	Newave Aerochemical FCY-2 Regression Coefficients Table and Verification Table
Table 2-10	Newave Aerochemical FCY-2 Bio+ Regression Coefficients Table and Verification Table
Table 2-11	Type II “Grandfathered” Fluid Data Regression Coefficients Table and Verification Table
Table 2-12	Type II Generic Verification Table
Table 3-1	AllClear AeroClear MAX Regression Coefficients Table and Verification Table (Low Speed)
Table 3-2	AllClear AeroClear MAX Regression Coefficients Table and Verification Table (High Speed)
Table 3-3	Clariant Safewing MP III 2031 ECO Regression Coefficients Table and Verification Table (Low Speed)
Table 3-4	Clariant Safewing MP III 2031 ECO Regression Coefficients Table and Verification Table (High Speed)
Table 4-1	ABAX Ecowing AD-49 Regression Coefficients Table and Verification Table
Table 4-2	Clariant Max Flight 04 Regression Coefficients Table and Verification Table
Table 4-3	Clariant Max Flight AVIA Regression Coefficients Table and Verification Table
Table 4-4	Clariant Max Flight SNEG Regression Coefficients Table and Verification Table
Table 4-5	Clariant Safewing EG IV NORTH Regression Coefficients Table and Verification Table
Table 4-6	Clariant Safewing MP IV LAUNCH Regression Coefficients Table and Verification Table
Table 4-7	Clariant Safewing MP IV LAUNCH PLUS Regression Coefficients Table and Verification Table
Table 4-8	Cryotech Polar Guard® Advance Regression Coefficients Table and Verification Table
Table 4-9	Deicing Solutions ECO-SHIELD® Regression Coefficients Table and Verification Table
Table 4-10	Dow Chemical UCAR™ Endurance EG106 Regression Coefficients Table and Verification Table
Table 4-11	Dow Chemical UCAR™ FlightGuard AD-49 Regression Coefficients Table and Verification Table
Table 4-12	Kilfrost ABC-S Plus Regression Coefficients Table and Verification Table
Table 4-13	LNT Solutions E450 Regression Coefficients Table and Verification Table
Table 4-14	Newave Aerochemical FCY 9311 Regression Coefficients Table and Verification Table
Table 4-15	Shaanxi Cleanway Aviation Cleansurface IV Regression Coefficients Table and Verification Table
Table 4-16	Type IV Generic Verification Table
Table 5	Lowest Usable Precipitation Rates in Snow

**TABLE 1-1
GENERIC TYPE I (ALUMINUM WING SURFACES)
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE**

Outside Air Temperature		Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions					
Degrees Celsius	Degrees Fahrenheit	Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}	Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
-3 and above	27 and above	I = 1.3735 A = -0.4751	I = 2.0072 A = -0.5752 B = -0.5585	I = 1.3829 A = -0.3848	I = 2.2598 A = -1.4012	I = 0.9355 A = -0.3384	CAUTION: No holdover time guidelines exist
below -3 to -6	below 27 to 21	I = 1.2734 A = -0.5299	I = 2.0072 A = -0.5752 B = -0.5585	I = 1.3842 A = -0.6152	I = 2.2598 A = -1.4012		
below -6 to -10	below 21 to 14	I = 1.1678 A = -0.5575	I = 2.0072 A = -0.5752 B = -0.5585	I = 1.2545 A = -0.5857	I = 2.2598 A = -1.4012		
below -10	below 14	I = 1.1473 A = -0.6415	I = 2.0072 A = -0.5752 B = -0.5585				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)

2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)

3 Type I aluminum snow values are rounded down to the nearest one minute (e.g. 6.5 mins = 6 mins, 18.6 mins = 18 mins) to determine holdover time table values

Outside Air Temp. (°C)	HOTDS Verification Times Under Various Weather Conditions (minutes) <i>As Calculated from Regression Coefficients</i>										
	Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
	5	2	25	10	4	13	5	25	13	75	5
+1 / -3 *	11.0	17.0	6.5	11.0	18.6	9.0	13.0	2.0	5.0	2.0	5.0
-6	8.0	13.0	5.0	8.5	14.3	5.0	9.0	2.0	5.0		
-10	6.0	10.0	4.0	6.7	11.4	4.0	7.0	2.0	5.0		
-25	5.0	9.0	2.5	4.3	7.3						

* Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C

**TABLE 1-2
GENERIC TYPE I (COMPOSITE WING SURFACES)
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE**

Outside Air Temperature		Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions					
Degrees Celsius	Degrees Fahrenheit	Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}	Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
-3 and above	27 and above	I = 1.3931 A = -0.6279	I = 1.6656 A = -0.7424 B = -0.2094	I = 1.4691 A = -0.5081	I = 2.2598 A = -1.4012	I = 1.1144 A = -0.5943	CAUTION: No holdover time guidelines exist
below -3 to -6	below 27 to 21	I = 0.9976 A = -0.3140	I = 1.6656 A = -0.7424 B = -0.2094	I = 1.3842 A = -0.6152	I = 2.2598 A = -1.4012		
below -6 to -10	below 21 to 14	I = 1.1308 A = -0.7565	I = 1.6656 A = -0.7424 B = -0.2094	I = 1.2545 A = -0.5857	I = 2.2598 A = -1.4012		
below -10	below 14	I = 1.0289 A = -0.6107	I = 2.0072 A = -0.5752 B = -0.5585				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)

2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)

3 Type I composite snow values below 10 mins are rounded down to the nearest one minute (e.g. 2.5 mins = 2 mins) to determine holdover time table values

Outside Air Temp. (°C)	HOTDS Verification Times Under Various Weather Conditions (minutes) <i>As Calculated from Regression Coefficients</i>										
	Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
	5	2	25	10	4	13	5	25	13	75	5
+1 / -3 *	9.0	16.0	3.0	6.0	11.8	8.0	13.0	2.0	5.0	1.0	5.0
-6	6.0	8.0	2.7	5.4	10.7	5.0	9.0	2.0	5.0		
-10	4.0	8.0	2.5	5.0	9.8	4.0	7.0	2.0	5.0		
-25	4.0	7.0	2.5	4.3	7.3						

* Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C

TABLE 2-1
ABAX ECOWING 26
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ^{1,4}	Rain on Cold Soaked Wing ¹	Other
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h				
-3 and above	27 and above	100/0	I = 2.3810 A = -0.6352	I = 2.3598 A = -0.5098 B = -0.0978	I = 2.3598 A = -0.5098 B = -0.0978	I = 2.3598 A = -0.5098 B = -0.0978	I = 2.4589 A = -0.6723	I = 2.0131 A = -0.2946	I = 2.3224 A = -0.5535	CAUTION: No holdover time guidelines exist
		75/25	I = 2.2439 A = -0.6073	I = 2.3334 A = -0.5288 B = -0.2160	I = 2.3334 A = -0.5288 B = -0.2160	I = 2.3485 A = -0.6016 B = -0.1043	I = 2.1009 A = -0.4085	I = 2.0488 A = -0.4806	I = 2.2032 A = -0.6072	
		50/50	I = 1.7955 A = -0.5090	I = 2.0178 A = -0.6943 B = 0.0298	I = 2.0178 A = -0.6943 B = 0.0298	I = 2.0178 A = -0.6943 B = 0.0298	I = 1.7327 A = -0.5413	I = 1.6166 A = -0.5058		
below -3 to -14	below 27 to 7	100/0	I = 2.5006 A = -1.2335	I = 2.3598 A = -0.5098 B = -0.0978	I = 2.3598 A = -0.5098 B = -0.0978	I = 2.3598 A = -0.5098 B = -0.0978	I = 2.4044 A = -0.8101	I = 2.7587 A = -1.1217		
		75/25	I = 2.1380 A = -0.8452	I = 2.3334 A = -0.5288 B = -0.2160	I = 2.3334 A = -0.5288 B = -0.2160	I = 2.3485 A = -0.6016 B = -0.1043	I = 2.2768 A = -0.8445	I = 2.3760 A = -0.8759		
below -14 to -25	below 7 to -13	100/0	I = 1.8682 A = -0.6972	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000				

- 1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
- 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
- 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5
- 4 Freezing drizzle and light freezing rain values were calculated at 12.7 g/dm²/h the year the holdover time table for this fluid was produced. Since they are now calculated at 13.0 g/dm²/h, values in the holdover time table may differ slightly from those calculated using these coefficients.

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	86.5	154.8	37.9	60.5	137.4	51.3	97.5	39.9	48.4	19.3	86.2
	75/25	66.0	115.1	27.2	47.2	105.5	44.2	65.4	23.8	32.6	11.6	60.1
	50/50	27.5	43.9	11.7	22.1	51.0	13.5	22.6	8.1	11.3		
-10 / -14 ***	100/0	43.5	134.7	33.8	54.0	122.6	31.8	68.9	15.5	32.3		
	75/25	35.3	76.5	24.1	41.8	82.1	21.7	48.6	14.2	25.1		
-25	100/0	24.0	45.5	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 2-2
AVIATION SHAANXI HI-TECH CLEANWING II
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions					Other
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}	Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	
-3 and above	27 and above	100/0	I = 2.2573 A = -0.7407	I = 2.4007 A = -0.6714 B = 0.0000	I = 2.1979 A = -0.5728	I = 2.2567 A = -0.6317	I = 2.1512 A = -0.6064	CAUTION: No holdover time guidelines exist
		75/25	I = 2.0742 A = -0.5411	I = 2.3510 A = -0.6986 B = 0.0000	I = 2.1475 A = -0.5338	I = 2.2158 A = -0.6683	I = 2.1568 A = -0.6861	
		50/50	I = 1.9836 A = -0.6276	I = 2.3242 A = -0.6725 B = -0.2889	I = 2.0341 A = -0.6288	I = 2.1847 A = -0.7830		
below -3 to -14	below 27 to 7	100/0	I = 2.3283 A = -0.9431	I = 2.4007 A = -0.6714 B = 0.0000	I = 2.1441 A = -0.6033	I = 1.8282 A = -0.4021		
		75/25	I = 2.3328 A = -1.0611	I = 2.3510 A = -0.6986 B = 0.0000	I = 1.6685 A = -0.1061	I = 1.7474 A = -0.3274		
below -14 to -29	below 7 to -20.2	100/0	I = 1.9950 A = -0.9540	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	54.9	108.2	29.0	53.6	99.2	36.3	62.7	23.6	35.7	10.3	53.4
	75/25	49.7	81.5	23.7	44.9	85.2	35.7	59.5	19.1	29.6	7.4	47.6
	50/50	35.1	62.3	15.2	28.2	35.8	21.6	39.3	12.3	20.5		
-10 / -14 ***	100/0	46.7	110.8	29.0	53.6	99.2	29.7	52.8	18.5	24.0		
	75/25	39.0	103.1	23.7	44.9	85.2	35.5	39.3	19.5	24.1		
-25	100/0	21.3	51.0	8.0	10.0	10.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

**TABLE 2-3
BEIJING YADILITE AVIATION YD-102 TYPE II
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE**

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions								
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other	
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h					
-3 and above	27 and above	100/0	I = 2.2562 A = -0.5977	I = 2.7385 A = -0.7402 B = -0.4299	I = 2.7385 A = -0.7402 B = -0.4299	I = 2.7385 A = -0.7402 B = -0.4299	I = 2.3920 A = -0.7249	I = 1.9465 A = -0.3059	I = 2.2622 A = -0.6682	CAUTION: No holdover time guidelines exist	
		75/25	I = 1.9892 A = -0.8353	I = 2.4080 A = -0.7439 B = -0.3491	I = 2.4080 A = -0.7439 B = -0.3491	I = 2.4080 A = -0.7439 B = -0.3491	I = 2.2407 A = -0.9340	I = 2.3425 A = -0.9259	I = 1.7678 A = -0.5942		
		50/50	I = 1.5895 A = -0.5473	I = 2.1960 A = -0.8600 B = -0.3992	I = 2.1960 A = -0.8600 B = -0.3992	I = 2.1960 A = -0.8600 B = -0.3992	I = 1.6035 A = -0.6300	I = 1.5230 A = -0.4848			
below -3 to -14	below 27 to 7	100/0	I = 2.1988 A = -0.7861	I = 2.7385 A = -0.7402 B = -0.4299	I = 2.7385 A = -0.7402 B = -0.4299	I = 2.7385 A = -0.7402 B = -0.4299	I = 2.0314 A = -0.4651	I = 1.4027 A = 0.0002			
		75/25	I = 1.8916 A = -0.6222	I = 2.4080 A = -0.7439 B = -0.3491	I = 2.4080 A = -0.7439 B = -0.3491	I = 2.4080 A = -0.7439 B = -0.3491	I = 1.8407 A = -0.6501	I = 1.5490 A = -0.3996			
below -14 to -29	below 7 to -20.2	100/0	I = 1.9202 A = -0.8505	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000					

- 1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
- 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
- 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5
- 4 Calculate value using both sets of coefficients; take shortest holdover time calculated

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes) <i>As Calculated from Regression Coefficients</i>										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	68.9	119.2	25.3	49.9	164.1	38.4	76.8	33.0	40.3	10.2	62.4
	75/25	25.4	54.7	13.3	26.3	87.1	15.9	38.7	11.2	20.5	4.5	22.5
	50/50	16.1	26.6	5.2	11.4	45.5	8.0	14.6	7.0	9.6		
-10 / -14 ***	100/0	44.6	91.7	15.3	30.2	99.5	32.6	50.9	25.3	25.3		
	75/25	28.6	50.6	8.9	17.5	58.0	13.1	24.3	9.8	12.7		
-25	100/0	21.2	46.2	8.0	10.0	25.0						

- * Refer to Table 5 for the lowest usable precipitation rates in snow
- ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
- *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 2-4
CLARIANT SAFEWING MP II FLIGHT
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions									
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other		
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h						
-3 and above	27 and above	100/0	I = 2.4369 A = -0.1630	I = 2.7425 A = -0.5435 B = -0.3120	I = 2.7425 A = -0.5435 B = -0.3120	I = 2.7425 A = -0.5435 B = -0.3120	I = 2.6541 A = -0.6697	I = 2.9080 A = -0.8860	I = 2.4810 A = -0.7583			
		75/25	I = 2.3415 A = -0.4326	I = 3.0163 A = -0.7162 B = -0.5615	I = 3.0163 A = -0.7162 B = -0.5615	I = 3.0163 A = -0.7162 B = -0.5615	I = 2.1306 A = -0.2689	I = 2.5596 A = -0.7512	I = 2.5884 or ⁴ I = 2.2277 A = -0.9638 A = -0.7375			
		50/50	I = 2.2250 A = -0.6732	I = 2.2879 A = -0.7080 B = -0.2971	I = 2.2879 A = -0.7080 B = -0.2971	I = 2.2879 A = -0.7080 B = -0.2971	I = 1.7413 A = -0.3693	I = 1.9070 A = -0.6463				
below -3 to -14	below 27 to 7	100/0	I = 2.2233 A = -0.6827	I = 2.7425 A = -0.5435 B = -0.3120	I = 2.7425 A = -0.5435 B = -0.3120	I = 2.7425 A = -0.5435 B = -0.3120	I = 2.6220 A = -0.9557	I = 2.5701 A = -0.8095	CAUTION: No holdover time guidelines exist			
		75/25	I = 2.1182 A = -1.0244	I = 3.0163 A = -0.7162 B = -0.5615	I = 3.0163 A = -0.7162 B = -0.5615	I = 3.0163 A = -0.7162 B = -0.5615	I = 2.6085 or ⁴ I = 2.7141 A = -1.0800 A = -1.2023	I = 2.3076 A = -0.6932				
below -14 to -29	below 7 to -20.2	100/0	I = 1.8996 A = -0.6356	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000						

- 1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
- 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
- 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5
- 4 Calculate value using both sets of coefficients; take shortest holdover time calculated

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	210.4	244.2	58.2	95.7	184.1	80.9	153.5	46.7	83.4	11.5	89.3
	75/25	109.4	162.7	41.9	80.8	256.0	67.8	87.6	32.3	52.8	6.0	51.5
	50/50	56.8	105.3	12.3	23.6	55.3	21.4	30.4	10.1	15.4		
-10 / -14 ***	100/0	55.7	104.2	40.5	66.6	128.1	36.1	89.9	27.4	46.6		
	75/25	25.2	64.5	21.8	42.1	133.2	23.7	71.4	21.8	34.3		
-25	100/0	28.5	51.1	8.0	10.0	25.0						

- * Refer to Table 5 for the lowest usable precipitation rates in snow
- ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
- *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 2-5
CLARIANT SAFEWING MP II FLIGHT PLUS
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions					Other
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}	Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	
-3 and above	27 and above	100/0	I = 2.5234 A = -0.4612	I = 3.1605 A = -0.8880 B = -0.3275	I = 2.4469 A = -0.4650	I = 2.2484 A = -0.4093	I = 2.6707 A = -0.8193	CAUTION: No holdover time guidelines exist
		75/25	I = 2.5521 A = -0.5255	I = 2.6834 A = -0.6171 B = -0.0598	I = 2.3720 A = -0.3524	I = 2.6120 A = -0.6593	I = 2.3026 A = -0.5932	
		50/50	I = 2.4106 A = -0.8778	I = 2.6120 A = -0.6769 B = -0.7145	I = 2.3447 A = -0.7750	I = 1.8799 A = -0.5318		
below -3 to -14	below 27 to 7	100/0	I = 2.5312 A = -1.2991	I = 3.1605 A = -0.8880 B = -0.3275	I = 2.6242 A = -0.9778	I = 2.5660 A = -0.7490		
		75/25	I = 2.4057 A = -1.2869	I = 2.6834 A = -0.6171 B = -0.0598	I = 2.5280 A = -0.9864	I = 2.1271 A = -0.4438		
below -14 to -29	below 7 to -20.2	100/0	I = 1.8877 A = -0.8771	I = 1.2435 A = -0.2435 B = 0.0000				

- 1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
- 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
- 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	158.9	242.4	49.0	110.6	204.6	84.9	132.4	47.4	62.0	13.6	125.3
	75/25	153.0	247.7	60.1	105.8	222.4	95.4	133.6	49.0	75.4	15.5	77.3
	50/50	62.7	140.1	14.7	27.3	50.7	30.3	63.5	13.7	19.4		
-10 / -14 ***	100/0	42.0	138.1	33.5	75.5	139.8	34.3	87.2	33.0	53.9		
	75/25	32.1	104.3	56.1	98.7	207.5	26.9	69.0	32.1	42.9		
-25	100/0	18.8	42.0	8.0	10.0	10.0						

- * Refer to Table 5 for the lowest usable precipitation rates in snow
- ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
- *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 2-6
CRYOTECH POLAR GUARD® II
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h				
-3 and above	27 and above	100/0	I = 2.5794 A = -0.5025	I = 2.6278 A = -0.3591 B = -0.3246	I = 2.6278 A = -0.3591 B = -0.3246	I = 2.6278 A = -0.3591 B = -0.3246	I = 2.2682 A = -0.2524	I = 2.2584 A = -0.2806	I = 2.6661 A = -0.7999	CAUTION: No holdover time guidelines exist
		75/25	I = 2.5776 A = -0.5705	I = 2.7318 A = -0.6352 B = -0.2744	I = 2.7318 A = -0.6352 B = -0.2744	I = 2.7318 A = -0.6352 B = -0.2744	I = 2.2204 A = -0.1898	I = 2.8328 A = -0.8896	I = 2.6248 A = -0.8807	
		50/50	I = 2.1254 A = -0.6271	I = 2.5102 A = -0.8406 B = -0.1391	I = 2.5102 A = -0.8406 B = -0.1391	I = 2.5102 A = -0.8406 B = -0.1391	I = 2.2943 A = -0.9086	I = 2.3695 A = -0.9996		
below -3 to -14	below 27 to 7	100/0	I = 2.5101 A = -1.1145	I = 2.6278 A = -0.3591 B = -0.3246	I = 2.6278 A = -0.3591 B = -0.3246	I = 2.6278 A = -0.3591 B = -0.3246	I = 2.7077 A = -1.0390	I = 2.0801 A = -0.3886		
		75/25	I = 2.2594 A = -0.9785	I = 2.7318 A = -0.6352 B = -0.2744	I = 2.7318 A = -0.6352 B = -0.2744	I = 2.7318 A = -0.6352 B = -0.2744	I = 2.4495 A = -0.9076	I = 2.0483 A = -0.3597		
below -14 to -30.5	below 7 to -22.9	100/0	I = 1.9253 A = -0.6979	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	169.1	268.0	79.2	110.1	169.7	97.1	123.5	73.5	88.3	14.7	127.9
	75/25	151.0	254.6	44.9	80.3	223.2	102.1	122.4	38.8	69.5	9.4	102.1
	50/50	48.6	86.4	17.3	37.4	144.5	19.2	45.6	9.4	18.0		
-10 / -14 ***	100/0	53.8	149.5	54.3	75.5	116.3	35.5	95.8	34.4	44.4		
	75/25	37.6	92.2	32.6	58.4	162.2	27.4	65.3	35.1	44.4		
-25	100/0	27.4	51.9	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 2-7
KILFROST ABC-ICE CLEAR II
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h				
-3 and above	27 and above	100/0	I = 2.1900 A = -0.5648	I = 2.6781 A = -0.7750 B = -0.2769	I = 2.6781 A = -0.7750 B = -0.2769	I = 2.6781 A = -0.7750 B = -0.2769	I = 2.1391 A = -0.4856	I = 1.8902 A = -0.3241	I = 2.1321 A = -0.6607	CAUTION: No holdover time guidelines exist
		75/25	I = 1.9366 A = -0.3504	I = 2.6264 A = -0.8000 B = -0.3280	I = 2.6264 A = -0.8000 B = -0.3280	I = 2.6264 A = -0.8000 B = -0.3280	I = 2.0223 A = -0.4964	I = 2.0814 A = -0.5477	I = 2.0217 A = -0.6724	
		50/50	I = 1.5907 A = -0.5021	I = 1.9548 A = -0.4632 B = -0.5448	I = 1.9548 A = -0.4632 B = -0.5448	I = 1.9548 A = -0.4632 B = -0.5448	I = 1.7170 A = -0.6398	I = 1.5657 A = -0.4822		
below -3 to -14	below 27 to 7	100/0	I = 2.2416 A = -0.9015	I = 2.6781 A = -0.7750 B = -0.2769	I = 2.6781 A = -0.7750 B = -0.2769	I = 2.6781 A = -0.7750 B = -0.2769	I = 2.3510 A = -0.8239	I = 2.4513 A = -0.8666		
		75/25	I = 2.1257 A = -0.7471	I = 2.6264 A = -0.8000 B = -0.3280	I = 2.6264 A = -0.8000 B = -0.3280	I = 2.6264 A = -0.8000 B = -0.3280	I = 2.0701 A = -0.5702	I = 1.7116 A = -0.3870		
below -14 to -29.5	below 7 to -21.1	100/0	I = 1.8242 A = -0.8203	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	62.4	104.7	25.2	51.2	130.3	39.6	63.0	27.4	33.8	7.8	46.8
	75/25	49.2	67.8	19.0	39.5	103.6	29.5	47.4	20.7	29.6	5.8	35.6
	50/50	17.4	27.5	8.4	12.9	27.2	10.1	18.6	7.8	10.7		
-10 / -14 ***	100/0	40.9	93.4	18.3	37.1	94.4	27.1	59.6	17.4	30.6		
	75/25	40.1	79.6	13.0	27.0	70.8	27.2	46.9	14.8	19.1		
-25	100/0	17.8	37.8	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

**TABLE 2-8
KILFROST ABC-K PLUS
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE**

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions					
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}	Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
-3 and above	27 and above	100/0	I = 2.5148 A = -0.5532	I = 2.6804 A = -0.5771 B = -0.1414	I = 2.2527 A = -0.1978	I = 2.5473 A = -0.5588	I = 2.6523 A = -0.7393	CAUTION: No holdover time guidelines exist
		75/25	I = 2.3020 A = -0.4342	I = 2.5273 A = -0.6849 B = -0.0149	I = 2.3200 A = -0.3522	I = 2.4709 A = -0.5601	I = 2.5956 A = -0.7470	
		50/50	I = 1.9950 A = -0.6463	I = 2.3972 A = -0.8261 B = -0.5288	I = 1.7256 A = -0.3910	I = 2.0364 A = -0.7354		
below -3 to -14	below 27 to 7	100/0	I = 2.0780 A = -0.8928	I = 2.6804 A = -0.5771 B = -0.1414	I = 2.4865 A = -0.9979	I = 3.2510 A = -1.5260		
		75/25	I = 2.3405 A = -1.3357	I = 2.5273 A = -0.6849 B = -0.0149	I = 2.4921 A = -1.0863	I = 3.6906 A = -1.9574		
below -14 to -29	below 7 to -20.2	100/0	I = 1.9498 A = -0.6590	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes) <i>As Calculated from Regression Coefficients</i>										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	134.3	223.0	59.5	101.0	171.4	107.7	130.1	58.4	84.1	18.5	136.6
	75/25	99.7	148.4	36.3	67.9	127.2	84.7	118.5	48.7	70.3	15.7	118.4
	50/50	34.9	63.2	7.5	15.9	60.1	19.5	28.3	10.2	16.5		
-10 / -14 ***	100/0	28.4	64.5	50.5	85.7	145.4	23.7	61.5	13.1	35.6		
	75/25	25.5	86.8	35.6	66.8	125.0	19.1	54.1	9.0	32.4		
-25	100/0	30.8	56.4	8.0	10.0	10.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

**TABLE 2-9
NEWAVE AEROCHEMICAL FCY-2
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE**

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions					Other
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}	Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	
-3 and above	27 and above	100/0	I = 2.3831 A = -0.7394	I = 2.7862 A = -0.6652 B = -0.5351	I = 2.3424 A = -0.7349	I = 2.1756 A = -0.5685	I = 2.0886 A = -0.6241	CAUTION: No holdover time guidelines exist
		75/25	I = 2.1617 A = -0.6765	I = 2.6255 A = -0.6413 B = -0.5531	I = 2.1241 A = -0.6856	I = 2.6154 A = -1.0787	I = 1.8312 A = -0.6039	
		50/50	I = 1.6808 A = -0.3883	I = 2.1561 A = -0.7445 B = 0.0000	I = 1.7656 A = -0.6698	I = 1.6020 A = -0.5128		
below -3 to -14	below 27 to 7	100/0	I = 2.1844 A = -0.7552	I = 2.7862 A = -0.6652 B = -0.5351	I = 2.2637 A = -0.8968	I = 1.6935 A = -0.3738		
		75/25	I = 2.0300 A = -0.7545	I = 2.6255 A = -0.6413 B = -0.5531	I = 2.0031 A = -0.7745	I = 2.0994 A = -0.8524		
below -14 to -28	below 7 to -18.4	100/0	I = 1.7388 A = -0.5485	I = 1.2435 A = -0.2435 B = 0.0000				

- 1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
- 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
- 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes) <i>As Calculated from Regression Coefficients</i>										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	73.5	144.7	30.4	55.8	162.9	33.4	67.4	24.0	34.9	8.3	44.9
	75/25	48.8	90.8	22.0	39.6	111.1	22.9	44.1	12.8	25.9	5.0	25.7
	50/50	25.7	36.6	13.0	25.8	85.5	10.5	19.8	7.7	10.7		
-10 / -14 ***	100/0	45.3	90.6	16.3	30.0	87.4	18.4	43.3	14.8	18.9		
	75/25	31.8	63.5	11.6	20.8	58.4	13.8	29.0	8.1	14.1		
-25	100/0	22.7	37.5	8.0	10.0	10.0						

- * Refer to Table 5 for the lowest usable precipitation rates in snow
- ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
- *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 2-10
NEWAVE AEROCHEMICAL FCY-2 BIO+
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h				
-3 and above	27 and above	100/0	I = 2.3819 A = -0.6607	I = 3.1420 A = -0.8361 B = -0.7102	I = 3.1420 A = -0.8361 B = -0.7102	I = 3.1420 A = -0.8361 B = -0.7102	I = 2.2626 A = -0.5057	I = 2.6041 A = -0.8687	I = 2.4390 A = -0.8058	CAUTION: No holdover time guidelines exist
		75/25	I = 2.0853 A = -0.6218	I = 2.8399 A = -0.7994 B = -0.6556	I = 2.8399 A = -0.7994 B = -0.6556	I = 2.8399 A = -0.7994 B = -0.6556	I = 2.2267 A = -0.7378	I = 1.9393 A = -0.5060	I = 1.9514 A = -0.5966	
		50/50	I = 1.6563 A = -0.6034	I = 1.9658 A = -0.5568 B = -0.3538	I = 1.9658 A = -0.5568 B = -0.3538	I = 1.9658 A = -0.5568 B = -0.3538	I = 1.6641 A = -0.5675	I = 1.7844 A = -0.6234		
below -3 to -14	below 27 to 7	100/0	I = 2.2250 A = -0.8616	I = 3.1420 A = -0.8361 B = -0.7102	I = 3.1420 A = -0.8361 B = -0.7102	I = 3.1420 A = -0.8361 B = -0.7102	I = 2.2571 A = -0.6478	I = 2.4418 A = -0.8745		
		75/25	I = 2.0676 A = -0.8031	I = 2.8399 A = -0.7994 B = -0.6556	I = 2.8399 A = -0.7994 B = -0.6556	I = 2.8399 A = -0.7994 B = -0.6556	I = 1.9065 A = -0.5604	I = 1.8028 A = -0.4737		
below -14 to -28.5	below 7 to -19.3	100/0	I = 2.0929 A = -1.0828	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	83.2	152.4	30.0	64.5	247.7	50.0	81.1	24.5	43.3	8.5	75.1
	75/25	44.7	79.1	18.4	38.2	138.4	25.4	51.4	17.1	23.7	6.8	34.2
	50/50	17.2	29.8	8.7	14.5	28.4	10.8	18.5	8.2	12.3		
-10 / -14 ***	100/0	42.0	92.4	13.1	28.2	108.4	34.3	63.7	16.6	29.4		
	75/25	32.1	67.0	8.6	17.8	64.5	19.2	32.7	13.8	18.8		
-25	100/0	21.7	58.5	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 2-11
TYPE II “GRANDFATHERED” FLUID DATA
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions ¹					Other
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ²	Snow, Snow Grains or Snow Pellets ^{2,3}	Freezing Drizzle ²	Light Freezing Rain ²	Rain on Cold Soaked Wing ²	
-3 and above	27 and above	100/0	I = 2.2645 A = -1.0307	I = 2.5382 A = -0.8850	I = 2.2851 A = -0.7254	I = 2.6578 A = -1.0599	I = 1.9599 A = -0.5119	CAUTION: No holdover time guidelines exist
		75/25	I = 2.0657 A = -0.9554	I = 2.2336 A = -0.7565	I = 2.2464 A = -0.8486	I = 2.9588 A = -1.4012	I = 1.8133 A = -0.5943	
		50/50	I = 2.0141 A = -1.1989	I = 2.3751 A = -1.1990	I = 1.8080 A = -0.7254	I = 2.1807 A = -1.0599		
below -3 to -14	below 27 to 7	100/0	I = 2.2645 A = -1.0307	I = 2.6725 A = -1.0704	I = 2.2851 A = -0.7254	I = 3.3485 A = -1.6800		
		75/25	I = 2.0657 A = -0.9554	I = 2.2336 A = -0.7565	I = 2.2464 A = -0.8486	I = 2.9588 A = -1.4012		
below -14 to -25	below 7 to -13	100/0	I = 2.4483 A = -1.6414	I = 1.2435 A = -0.2435				

1 The Grandfather fluid regression information is only to be used in the calculation of Type II generic holdover times. The information cannot be used to deduce fluid-specific holdover times for any fluid.

2 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	35.0	90.0	20.0	45.0	45.0	30.0	60.0	15.0	30.0	10.0	40.0
	75/25	25.0	60.0	15.0	30.0	30.0	20.0	45.0	10.0	25.0	5.0	25.0
	50/50	15.0	45.0	5.0	15.0	15.0	10.0	20.0	5.0	10.0		
-10 / -14 ***	100/0	35.0	90.0	15.0	40.0	40.0	30.0	60.0	10.0	30.0		
	75/25	25.0	60.0	15.0	30.0	30.0	20.0	45.0	10.0	25.0		
-25	100/0	20.0	90.0	8.0	10.0	10.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow

** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C

*** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 2-12
TYPE II GENERIC
VERIFICATION TABLE

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes) As Calculated from Regression Coefficients									
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)		Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	13	5	25	13	75	5
+1 / -3 *	100/0	35.0	90.0	20.0	45.0	30.0	60.0	15.0	30.0	7.8	40.0
	75/25	25.0	54.7	13.3	26.3	15.9	38.7	10.0	20.5	4.5	22.5
	50/50	15.0	26.6	5.0	11.4	8.0	14.6	5.0	9.6		
-10 / -14 **	100/0	19.0	64.5	13.1	28.2	18.4	43.3	10.0	18.9		
	75/25	24.5	50.6	8.6	17.5	13.1	24.3	8.1	12.7		
-25	100/0	17.4	37.5	8.0	10.0						

* Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C

** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

**TABLE 3-1
ALLCLEAR AEROCLEAR MAX, APPLIED UNHEATED**

FOR AIRCRAFT CONFORMING TO THE SAE AS5900 LOW SPEED AERODYNAMIC TEST CRITERION
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions ¹					Other
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ²	Snow, Snow Grains or Snow Pellets ^{3,4}	Freezing Drizzle ²	Light Freezing Rain ²	Rain on Cold Soaked Wing ²	
-3 and above	27 and above	100/0	I = 2.0236 A = -0.5492	I = 2.2296 A = -0.7601 B = 0.0000	I = 2.1862 A = -0.7684	I = 2.0417 A = -0.6247	I = 2.0334 A = -0.6545	CAUTION: No holdover time guidelines exist
		75/25	n/a	n/a	n/a	n/a	n/a	
		50/50	n/a	n/a	n/a	n/a		
below -3 to -10	below 27 to 14	100/0	I = 2.1200 A = -0.6403	I = 2.2296 A = -0.7601 B = 0.0000	I = 2.0487 A = -0.6552	I = 2.0446 A = -0.6155		
		75/25	n/a	n/a	n/a	n/a		
below -10 to -16	below 14 to 3.2	100/0	I = 2.0874 A = -0.9193	I = 2.2296 A = -0.7601 B = 0.0000				

- 1 CAUTION: Fluid must be applied unheated to use these regression coefficients
- 2 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
- 3 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
- 4 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes) As Calculated from Regression Coefficients											
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)				Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	4	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	43.6	72.2	14.7	29.5	59.1	100.2	21.4	44.6	14.7	22.2	6.4	37.7
	75/25	n/a	n/a	n/a	n/a	n/a	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	n/a	n/a	n/a		
-10	100/0	47.0	84.6	14.7	29.5	59.1	100.2	20.8	39.0	15.3	22.9		
	75/25	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		
-25	100/0	27.9	64.7	14.7	29.5	59.1	100.2						

* Refer to Table 5 for the lowest usable precipitation rates in snow
** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C

TABLE 3-2
ALLCLEAR AEROCLEAR MAX, APPLIED UNHEATED

FOR AIRCRAFT CONFORMING TO THE SAE AS5900 HIGH SPEED AERODYNAMIC TEST CRITERION
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions ¹					
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ²	Snow, Snow Grains or Snow Pellets ^{3,4}	Freezing Drizzle ²	Light Freezing Rain ²	Rain on Cold Soaked Wing ²	Other
-3 and above	27 and above	100/0	I = 2.0236 A = -0.5492	I = 2.2296 A = -0.7601 B = 0.0000	I = 2.1862 A = -0.7684	I = 2.0417 A = -0.6247	I = 2.0334 A = -0.6545	CAUTION: No holdover time guidelines exist
		75/25	n/a	n/a	n/a	n/a	n/a	
		50/50	n/a	n/a	n/a	n/a		
below -3 to -10	below 27 to 14	100/0	I = 2.1200 A = -0.6403	I = 2.2296 A = -0.7601 B = 0.0000	I = 2.0487 A = -0.6552	I = 2.0446 A = -0.6155		
		75/25	n/a	n/a	n/a	n/a		
below -10 to -25	below 14 to -13	100/0	I = 2.0874 A = -0.9193	I = 2.2296 A = -0.7601 B = 0.0000				
below -25 to -35	below -13 to -31	100/0	I = 1.9556 A = -1.1000	I = 2.0420 A = -0.7595 B = 0.0000				

1 CAUTION: Fluid must be applied unheated to use these regression coefficients
 2 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 3 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 4 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes) As Calculated from Regression Coefficients											
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)				Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	4	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	43.6	72.2	14.7	29.5	59.1	100.2	21.4	44.6	14.7	22.2	6.4	37.7
	75/25	n/a	n/a	n/a	n/a	n/a	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	n/a	n/a	n/a		
-10	100/0	47.0	84.6	14.7	29.5	59.1	100.2	20.8	39.0	15.3	22.9		
	75/25	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		
-25	100/0	27.9	64.7	14.7	29.5	59.1	100.2						
-35	100/0	15.4	42.1	9.6	19.2	38.4	47.8						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C

TABLE 3-3

CLARIANT SAFEWING MP III 2031 ECO, APPLIED HEATED

FOR AIRCRAFT CONFORMING TO THE SAE AS5900 LOW SPEED AERODYNAMIC TEST CRITERION

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions ¹					
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ²	Snow, Snow Grains or Snow Pellets ^{3,4}	Freezing Drizzle ²	Light Freezing Rain ²	Rain on Cold Soaked Wing ²	Other
-3 and above	27 and above	100/0	I = 1.9317 A = -0.7452	I = 2.1207 A = -0.7409 B = -0.0669	I = 1.8697 A = -0.5638	I = 1.7375 A = -0.5253	I = 1.9621 A = -0.6759	CAUTION: No holdover time guidelines exist
		75/25	I = 1.8484 A = -0.8000	I = 2.2969 A = -0.8365 B = -0.3501	I = 1.6784 A = -0.5016	I = 1.2679 A = -0.2558	I = 1.7300 A = -0.6644	
		50/50	I = 1.3864 A = -0.3800	I = 1.9716 A = -0.7146 B = -0.1861	I = 1.2707 A = -0.1382	I = 0.8903 A = -0.0081		
below -3 to -10	below 27 to 14	100/0	I = 2.1198 A = -0.8173	I = 2.1207 A = -0.7409 B = -0.0669	I = 1.9646 A = -0.7345	I = 1.7804 A = -0.5922		
		75/25	I = 1.9517 A = -0.9364	I = 2.2969 A = -0.8365 B = -0.3501	I = 1.6166 A = -0.5685	I = 1.2506 A = -0.3056		
below -10 to -16.5	below 14 to 2.3	100/0	I = 1.8844 A = -0.7096	I = 2.1207 A = -0.7409 B = -0.0669				

- 1 CAUTION: Fluid must be applied heated to use these regression coefficients
- 2 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
- 3 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
- 4 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes) <i>As Calculated from Regression Coefficients</i>											
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)				Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	4	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	25.8	51.0	10.9	21.5	42.4	70.9	17.4	29.9	10.1	14.2	5.0	30.9
	75/25	19.5	40.5	7.6	16.4	35.4	63.2	13.2	21.3	8.1	9.6	3.0	18.4
	50/50	13.2	18.7	7.0	13.4	25.8	42.3	13.1	14.9	7.6	7.6		
-10	100/0	35.4	74.8	10.3	20.3	40.0	66.9	14.0	28.3	9.0	13.2		
	75/25	19.8	46.8	5.6	12.1	26.0	46.5	9.6	16.6	6.7	8.1		
-25	100/0	24.5	46.9	9.8	19.2	37.9	63.4						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C

TABLE 3-4
CLARIANT SAFEWING MP III 2031 ECO, APPLIED HEATED

FOR AIRCRAFT CONFORMING TO THE SAE AS5900 HIGH SPEED AERODYNAMIC TEST CRITERION
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions ¹					
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ²	Snow, Snow Grains or Snow Pellets ^{3,4}	Freezing Drizzle ²	Light Freezing Rain ²	Rain on Cold Soaked Wing ²	Other
-3 and above	27 and above	100/0	I = 1.9317 A = -0.7452	I = 2.1207 A = -0.7409 B = -0.0669	I = 1.8697 A = -0.5638	I = 1.7375 A = -0.5253	I = 1.9621 A = -0.6759	CAUTION: No holdover time guidelines exist
		75/25	I = 1.8484 A = -0.8000	I = 2.2969 A = -0.8365 B = -0.3501	I = 1.6784 A = -0.5016	I = 1.2679 A = -0.2558	I = 1.7300 A = -0.6644	
		50/50	I = 1.3864 A = -0.3800	I = 1.9716 A = -0.7146 B = -0.1861	I = 1.2707 A = -0.1382	I = 0.8903 A = -0.0081		
below -3 to -10	below 27 to 14	100/0	I = 2.1198 A = -0.8173	I = 2.1207 A = -0.7409 B = -0.0669	I = 1.9646 A = -0.7345	I = 1.7804 A = -0.5922		
		75/25	I = 1.9517 A = -0.9364	I = 2.2969 A = -0.8365 B = -0.3501	I = 1.6166 A = -0.5685	I = 1.2506 A = -0.3056		
below -10 to -25	below 14 to -13	100/0	I = 1.8844 A = -0.7096	I = 2.1207 A = -0.7409 B = -0.0669				
below -25 to -29	below -13 to -20.2	100/0	I = 1.8844 A = -0.7096	I = 2.1207 A = -0.7409 B = -0.0669				

- 1 CAUTION: Fluid must be applied heated to use these regression coefficients
- 2 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
- 3 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
- 4 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes) As Calculated from Regression Coefficients											
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)				Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	4	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	25.8	51.0	10.9	21.5	42.4	70.9	17.4	29.9	10.1	14.2	5.0	30.9
	75/25	19.5	40.5	7.6	16.4	35.4	63.2	13.2	21.3	8.1	9.6	3.0	18.4
	50/50	13.2	18.7	7.0	13.4	25.8	42.3	13.1	14.9	7.6	7.6		
-10	100/0	35.4	74.8	10.3	20.3	40.0	66.9	14.0	28.3	9.0	13.2		
	75/25	19.8	46.8	5.6	12.1	26.0	46.5	9.6	16.6	6.7	8.1		
-25	100/0	24.5	46.9	9.8	19.2	37.9	63.4						
-29	100/0	24.5	46.9	9.7	19.1	37.6	62.8						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C

TABLE 4-1
ABAX ECOWING AD-49
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h				
-3 and above	27 and above	100/0	I = 2.4713 A = -0.2370	I = 2.5108 A = -0.4746 B = 0.0000	I = 2.5108 A = -0.4746 B = 0.0000	I = 2.5108 A = -0.4746 B = 0.0000	I = 2.3729 A = -0.3927	I = 2.4943 A = -0.5000	I = 2.6531 A = -0.8558	CAUTION: No holdover time guidelines exist
		75/25	I = 2.5800 A = -0.6022	I = 2.2550 A = -0.2574 B = 0.0000	I = 2.2550 A = -0.2574 B = 0.0000	I = 2.2550 A = -0.2574 B = 0.0000	I = 2.1714 A = -0.1070	I = 2.9993 A = -0.9367	I = 2.5561 A = -0.8097	
		50/50	I = 1.9283 A = -0.7029	I = 2.0082 A = -0.5107 B = -0.1529	I = 2.0082 A = -0.5107 B = -0.1529	I = 2.0082 A = -0.5107 B = -0.1529	I = 2.0190 A = -0.7545	I = 1.5732 A = -0.3413		
below -3 to -14	below 27 to 7	100/0	I = 2.5177 A = -1.7715	I = 2.5108 A = -0.4746 B = 0.0000	I = 2.5108 A = -0.4746 B = 0.0000	I = 2.5108 A = -0.4746 B = 0.0000	I = 2.8172 A = -1.2681	I = 1.9828 A = -0.5016		
		75/25	I = 2.1600 A = -1.0180	I = 2.2550 A = -0.2574 B = 0.0000	I = 2.2550 A = -0.2574 B = 0.0000	I = 2.2550 A = -0.2574 B = 0.0000	I = 2.7575 A = -1.3630	I = 2.3495 A = -0.8598		
below -14 to -26	below 7 to -14.8	100/0	I = 1.7838 A = -0.5976	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	202.1	251.2	70.4	108.7	192.5	86.2	125.4	62.4	86.6	11.2	113.5
	75/25	144.2	250.4	78.6	99.4	135.6	112.8	124.9	49.0	90.3	10.9	97.8
	50/50	27.4	52.1	15.4	24.6	45.5	15.1	31.0	12.5	15.6		
-10 / -14 ***	100/0	19.0	96.5	70.4	108.7	192.5	25.4	85.3	19.1	26.5		
	75/25	28.1	71.4	78.6	99.4	135.6	17.3	63.8	14.0	24.6		
-25	100/0	23.2	40.2	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 4-2
CLARIANT MAX FLIGHT 04
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ^{1,4}	Rain on Cold Soaked Wing ¹	Other
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h				
-3 and above	27 and above	100/0	I = 2.5102 A = -0.4343	I = 3.4634 A = -0.7407 B = -0.7275	I = 3.4634 A = -0.7407 B = -0.7275	I = 3.4634 A = -0.7407 B = -0.7275	I = 2.0949 A = -0.0224	I = 2.4117 A = -0.4124	I = 2.6420 A = -0.6956	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 -14	below 27 to 7	100/0	I = 2.5385 A = -1.1945	I = 3.4634 A = -0.7407 B = -0.7275	I = 3.4634 A = -0.7407 B = -0.7275	I = 3.4634 A = -0.7407 B = -0.7275	I = 2.8956 A = -1.3456	I = 2.8529 A = -1.1429		
		75/25	n/a	n/a	n/a	n/a	n/a	n/a		
below -14 to -23.5	below 7 to -10.3	100/0	I = 1.8804 A = -0.7843	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)

2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

4 Freezing drizzle and light freezing rain values were calculated at 12.7 g/dm²/h the year the holdover time table for this fluid was produced. Since they are now calculated at 13.0 g/dm²/h, values in the holdover time table may differ slightly from those calculated using these coefficients.

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	160.9	239.6	83.1	163.8	539.4	117.5	120.0	68.4	89.6	21.8	143.2
	75/25	n/a	n/a	n/a	n/a	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	n/a	n/a		
-10 / -14 ***	100/0	50.5	151.0	35.6	70.3	231.4	24.9	90.2	18.0	38.0		
	75/25	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		
-25	100/0	21.5	44.1	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow

** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C

*** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

**TABLE 4-3
CLARIANT MAX FLIGHT AVIA
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE**

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h				
-3 and above	27 and above	100/0	I = 2.4864 A = -0.3214	I = 2.8243 A = -0.6182 B = -0.2788	I = 2.8243 A = -0.6182 B = -0.2788	I = 2.8243 A = -0.6182 B = -0.2788	I = 2.5168 A = -0.5284	I = 2.2295 A = -0.3416	I = 2.8870 A = -1.0183	CAUTION: No holdover time guidelines exist
		75/25	n/a	n/a	n/a	n/a	n/a	n/a	I = 2.0976 A = -0.6736	
		50/50	n/a	n/a	n/a	n/a	n/a	n/a		
below -3 to -14	below 27 to 7	100/0	I = 2.6347 A = -0.8798	I = 2.8243 A = -0.6182 B = -0.2788	I = 2.8243 A = -0.6182 B = -0.2788	I = 2.8243 A = -0.6182 B = -0.2788	I = 2.5583 A = -0.6474	I = 2.7838 A = -0.7360		
		75/25	n/a	n/a	n/a	n/a	n/a	n/a		
below -14 to -28.5	below 7 to -19.3	100/0	I = 2.1916 A = -0.8933	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)

2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

4 Freezing drizzle and light freezing rain values were calculated at 12.7 g/dm²/h the year the holdover time table for this fluid was produced. Since they are now calculated at 13.0 g/dm²/h, values in the holdover time table may differ slightly from those calculated using these coefficients.

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	182.7	245.3	58.2	102.6	277.5	84.8	140.4	56.5	70.6	9.5	149.7
	75/25	n/a	n/a	n/a	n/a	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	n/a	n/a		
-10 / -14 ***	100/0	104.7	234.3	42.1	74.2	200.7	68.7	127.6	56.9	92.0		
	75/25	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		
-25	100/0	36.9	83.7	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow

** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C

*** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 4-4
CLARIANT MAX FLIGHT SNEG
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h				
-3 and above	27 and above	100/0	I = 2.5734 A = -0.5916	I = 2.7082 A = -0.5259 B = -0.2526	I = 2.7082 A = -0.5259 B = -0.2526	I = 2.7082 A = -0.5259 B = -0.2526	I = 2.1201 A = -0.0318	I = 3.1463 A = -1.0213	I = 2.3856 A = -0.6074	CAUTION: No holdover time guidelines exist
		75/25	I = 2.3956 A = -0.0226	I = 2.6974 A = -0.5329 B = -0.3096	I = 2.6974 A = -0.5329 B = -0.3096	I = 2.6974 A = -0.5329 B = -0.3096	I = 2.3595 A = -0.3733	I = 2.1906 A = -0.2633	I = 2.5045 A = -0.7062	
		50/50	I = 2.6114 A = -0.9560	I = 2.5982 A = -0.9523 B = 0.0000	I = 2.5982 A = -0.9523 B = 0.0000	I = 2.5982 A = -0.9523 B = 0.0000	I = 2.3438 A = -0.7175	I = 2.7427 A = -1.1421		
below -3 to -14	below 27 to 7	100/0	I = 2.5197 A = -1.2481	I = 2.7082 A = -0.5259 B = -0.2526	I = 2.7082 A = -0.5259 B = -0.2526	I = 2.7082 A = -0.5259 B = -0.2526	I = 2.7003 A = -1.0853	I = 2.6961 A = -0.9598		
		75/25	I = 2.2989 A = -1.2091	I = 2.6974 A = -0.5329 B = -0.3096	I = 2.6974 A = -0.5329 B = -0.3096	I = 2.6974 A = -0.5329 B = -0.3096	I = 2.5864 A = -1.1239	I = 2.7996 A = -1.0818		
below -14 to -29	below 7 to -20.2	100/0	I = 1.9524 A = -0.8898	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	144.5	248.5	62.6	101.3	190.9	121.5	125.3	52.3	102.0	17.6	91.4
	75/25	239.8	244.8	54.5	88.7	168.6	87.8	125.5	66.5	78.9	15.1	102.5
	50/50	87.7	210.7	18.5	44.2	139.3	35.0	69.5	14.0	29.5		
-10 / -14 ***	100/0	44.4	139.3	46.7	75.5	142.3	31.0	87.4	22.6	42.4		
	75/25	28.4	86.1	38.0	61.9	117.6	21.6	63.2	19.4	39.3		
-25	100/0	21.4	48.4	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 4-5
CLARIANT SAFEWING EG IV NORTH
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h				
-3 and above	27 and above	100/0	I = 2.5514 A = -0.5862	I = 2.7261 A = -0.6800 B = -0.0814	I = 2.7261 A = -0.6800 B = -0.0814	I = 2.7261 A = -0.6800 B = -0.0814	I = 2.4593 A = -0.4518	I = 2.0514 A = -0.2650	I = 2.7876 A = -0.9859	CAUTION: No holdover time guidelines exist
		75/25	n/a	n/a	n/a	n/a	n/a	n/a	I = 2.3567 A = -0.8762	
		50/50	n/a	n/a	n/a	n/a	n/a	n/a		
below -3 to -14	below 27 to 7	100/0	I = 2.6521 A = -0.9130	I = 2.7261 A = -0.6800 B = -0.0814	I = 2.7261 A = -0.6800 B = -0.0814	I = 2.7261 A = -0.6800 B = -0.0814	I = 2.4417 A = -0.5677	I = 2.7481 A = -0.7299		
		75/25	n/a	n/a	n/a	n/a	n/a	n/a		
below -14 to -30	below 7 to -22	100/0	I = 2.1343 A = -0.7329	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	138.6	237.1	52.3	97.5	291.4	90.4	139.2	48.0	57.0	8.7	125.5
	75/25	n/a	n/a	n/a	n/a	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	n/a	n/a	n/a	n/a
-10 / -14 ***	100/0	103.3	238.4	47.6	88.7	265.1	64.5	110.9	53.4	86.1		
	75/25	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		
-25	100/0	41.9	82.0	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 4-6
CLARIANT SAFEWING MP IV LAUNCH
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h				
-3 and above	27 and above	100/0	I = 2.3942 A = 0.0152	I = 2.7218 A = -0.5330 B = -0.2408	I = 2.7218 A = -0.5330 B = -0.2408	I = 2.7218 A = -0.5330 B = -0.2408	I = 2.7789 A = -0.7426	I = 2.9492 A = -0.8489	I = 2.5170 A = -0.7291	CAUTION: No holdover time guidelines exist
		75/25	I = 2.4388 A = -0.1431	I = 2.7841 A = -0.6180 B = -0.2044	I = 2.7841 A = -0.6180 B = -0.2044	I = 2.7841 A = -0.6180 B = -0.2044	I = 2.7945 A = -0.7101	I = 2.7548 A = -0.7917	I = 2.6192 A = -0.8499	
		50/50	I = 2.4323 A = -0.7333	I = 2.3978 A = -0.6703 B = -0.1021	I = 2.3978 A = -0.6703 B = -0.1021	I = 2.3978 A = -0.6703 B = -0.1021	I = 2.0818 A = -0.5727	I = 1.7686 A = -0.3607		
below -3 to -14	below 27 to 7	100/0	I = 2.2823 A = -0.7333	I = 2.7218 A = -0.5330 B = -0.2408	I = 2.7218 A = -0.5330 B = -0.2408	I = 2.7218 A = -0.5330 B = -0.2408	I = 2.7424 A = -1.0767	I = 2.6379 A = -0.8846		
		75/25	I = 2.1203 A = -0.7220	I = 2.7841 A = -0.6180 B = -0.2044	I = 2.7841 A = -0.6180 B = -0.2044	I = 2.7841 A = -0.6180 B = -0.2044	I = 2.6204 A = -1.0940	I = 2.4901 A = -0.7708		
below -14 to -28.5	below 7 to -19.3	100/0	I = 1.8894 A = -0.6349	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	254.0	250.5	64.3	104.8	199.2	89.5	181.9	57.9	100.8	14.1	101.7
	75/25	218.2	248.7	59.9	105.5	222.0	100.8	198.7	44.5	74.6	10.6	106.0
	50/50	83.1	162.8	24.5	45.3	133.2	27.8	48.0	18.4	23.3		
-10 / -14 ***	100/0	58.8	115.2	48.6	79.2	150.5	34.9	97.7	25.2	44.9		
	75/25	41.3	80.0	47.2	83.2	175.0	25.2	71.7	25.9	42.8		
-25	100/0	27.9	49.9	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 4-7
CLARIANT SAFEWING MP IV LAUNCH PLUS
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h				
-3 and above	27 and above	100/0	I = 2.3920 A = -0.0283	I = 3.2161 A = -0.8902 B = -0.3284	I = 3.2161 A = -0.8902 B = -0.3284	I = 3.2161 A = -0.8902 B = -0.3284	I = 2.1074 A = -0.0294	I = 3.1822 A = -0.9927	I = 2.5435 A = -0.6674	CAUTION: No holdover time guidelines exist
		75/25	I = 2.3948 A = -0.0330	I = 3.2776 A = -0.9501 B = -0.3856	I = 3.2776 A = -0.9501 B = -0.3856	I = 3.2776 A = -0.9501 B = -0.3856	I = 2.0839 A = -0.0124	I = 2.0297 A = -0.0872	I = 2.4962 A = -0.6485	
		50/50	I = 2.1682 A = -0.4153	I = 2.6868 A = -0.8488 B = -0.2819	I = 2.6868 A = -0.8488 B = -0.2819	I = 2.6868 A = -0.8488 B = -0.2819	I = 2.4651 A = -0.9953	I = 1.8233 A = -0.4948		
below -3 to -14	below 27 to 7	100/0	I = 2.4166 A = -0.9721	I = 3.2161 A = -0.8902 B = -0.3284	I = 3.2161 A = -0.8902 B = -0.3284	I = 3.2161 A = -0.8902 B = -0.3284	I = 2.8810 A = -1.3058	I = 2.2126 A = -0.5630		
		75/25	I = 2.4251 A = -1.1486	I = 3.2776 A = -0.9501 B = -0.3856	I = 3.2776 A = -0.9501 B = -0.3856	I = 3.2776 A = -0.9501 B = -0.3856	I = 2.5583 A = -1.0902	I = 2.1385 A = -0.5738		
below -14 to -29	below 7 to -20.2	100/0	I = 1.9339 A = -0.8158	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	235.6	241.8	55.2	124.8	364.6	118.8	122.1	62.3	119.2	19.6	119.4
	75/25	235.4	242.6	47.9	114.3	358.7	117.5	118.9	80.9	85.6	19.1	110.4
	50/50	75.5	110.5	20.1	43.7	171.5	22.7	58.8	13.5	18.7		
-10 / -14 ***	100/0	54.6	133.0	37.7	85.2	248.8	26.7	93.0	26.6	38.5		
	75/25	41.9	120.0	30.6	73.0	229.1	22.1	62.6	21.7	31.6		
-25	100/0	23.1	48.8	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 4-8
CRYOTECH POLAR GUARD® ADVANCE
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h				
-3 and above	27 and above	100/0	I = 2.5794 A = -0.5025	I = 2.6278 A = -0.3591 B = -0.3246	I = 2.6278 A = -0.3591 B = -0.3246	I = 2.6278 A = -0.3591 B = -0.3246	I = 2.2682 A = -0.2524	I = 2.2584 A = -0.2806	I = 2.6661 A = -0.7999	CAUTION: No holdover time guidelines exist
		75/25	I = 2.5776 A = -0.5705	I = 2.7318 A = -0.6352 B = -0.2744	I = 2.7318 A = -0.6352 B = -0.2744	I = 2.7318 A = -0.6352 B = -0.2744	I = 2.2204 A = -0.1898	I = 2.8328 A = -0.8896	I = 2.6248 A = -0.8807	
		50/50	I = 2.1254 A = -0.6271	I = 2.5102 A = -0.8406 B = -0.1391	I = 2.5102 A = -0.8406 B = -0.1391	I = 2.5102 A = -0.8406 B = -0.1391	I = 2.2943 A = -0.9086	I = 2.3695 A = -0.9996		
below -3 to -14	below 27 to 7	100/0	I = 2.5101 A = -1.1145	I = 2.6278 A = -0.3591 B = -0.3246	I = 2.6278 A = -0.3591 B = -0.3246	I = 2.6278 A = -0.3591 B = -0.3246	I = 2.7077 A = -1.0390	I = 2.0801 A = -0.3886		
		75/25	I = 2.2594 A = -0.9785	I = 2.7318 A = -0.6352 B = -0.2744	I = 2.7318 A = -0.6352 B = -0.2744	I = 2.7318 A = -0.6352 B = -0.2744	I = 2.4495 A = -0.9076	I = 2.0483 A = -0.3597		
below -14 to -30.5	below 7 to -22.9	100/0	I = 1.9253 A = -0.6979	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	169.1	268.0	79.2	110.1	169.7	97.1	123.5	73.5	88.3	14.7	127.9
	75/25	151.0	254.6	44.9	80.3	223.2	102.1	122.4	38.8	69.5	9.4	102.1
	50/50	48.6	86.4	17.3	37.4	144.5	19.2	45.6	9.4	18.0		
-10 / -14 ***	100/0	53.8	149.5	54.3	75.5	116.3	35.5	95.8	34.4	44.4		
	75/25	37.6	92.2	32.6	58.4	162.2	27.4	65.3	35.1	44.4		
-25	100/0	27.4	51.9	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 4-9
DEICING SOLUTIONS ECO-SHIELD®
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions								
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other	
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h					
-3 and above	27 and above	100/0	I = 2.4628 A = -0.8425	I = 2.6693 A = -0.6224 B = -0.2015	I = 2.6693 A = -0.6224 B = -0.2015	I = 2.6693 A = -0.6224 B = -0.2015	I = 2.5329 A = -0.8434	I = 1.8305 A = -0.1843	I = 2.4740 A = -0.7236	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 -14	below 27 to 7	100/0	I = 2.4493 A = -0.8541	I = 2.6693 A = -0.6224 B = -0.2015	I = 2.6693 A = -0.6224 B = -0.2015	I = 2.6693 A = -0.6224 B = -0.2015	I = 2.3150 A = -0.5411	I = 1.9809 A = -0.3441	CAUTION: No holdover time guidelines exist		
		75/25	n/a	n/a	n/a	n/a	n/a	n/a			
below -14 to -25.5	below 7 to -13.9	100/0	I = 1.9894 A = -0.6913	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000					

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	74.8	161.9	45.5	80.5	219.3	39.2	87.8	37.4	42.2	13.1	92.9
	75/25	n/a	n/a	n/a	n/a	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	n/a	n/a	n/a	n/a
-10 / -14 ***	100/0	71.2	155.7	36.0	63.7	173.5	51.6	86.5	31.6	39.6		
	75/25	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		
-25	100/0	32.1	60.4	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 4-10
DOW CHEMICAL UCAR™ ENDURANCE EG106
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h				
-3 and above	27 and above	100/0	I = 2.4198 A = -0.4664	I = 2.8358 A = -0.7951 B = -0.1996	I = 2.8358 A = -0.7951 B = -0.1996	I = 2.8358 A = -0.7951 B = -0.1996	I = 2.4460 A = -0.5295	I = 2.5011 A = -0.5672	I = 2.5903 A = -0.7102	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 -14	below 27 to 7	100/0	I = 2.4942 A = -0.6588	I = 2.8358 A = -0.7951 B = -0.1996	I = 2.8358 A = -0.7951 B = -0.1996	I = 2.8358 A = -0.7951 B = -0.1996	I = 2.5065 A = -0.6779	I = 2.6525 A = -0.7145	CAUTION: No holdover time guidelines exist	
		75/25	n/a	n/a	n/a	n/a	n/a	n/a		
below -14 to -27	below 7 to -16.6	100/0	I = 2.0589 A = -0.7941	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	124.1	190.3	38.4	79.6	207.5	71.8	119.1	51.1	74.0	18.1	124.1
	75/25	n/a	n/a	n/a	n/a	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	n/a	n/a	n/a	n/a
-10 / -14 ***	100/0	108.1	197.6	30.5	63.1	164.5	56.4	107.8	45.0	71.9		
	75/25	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		
-25	100/0	31.9	66.0	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 4-11
DOW CHEMICAL UCAR™ FLIGHTGUARD AD-49
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h				
-3 and above	27 and above	100/0	I = 2.4713 A = -0.2370	I = 2.5108 A = -0.4746 B = 0.0000	I = 2.5108 A = -0.4746 B = 0.0000	I = 2.5108 A = -0.4746 B = 0.0000	I = 2.3729 A = -0.3927	I = 2.4943 A = -0.5000	I = 2.6531 A = -0.8558	CAUTION: No holdover time guidelines exist
		75/25	I = 2.5800 A = -0.6022	I = 2.2550 A = -0.2574 B = 0.0000	I = 2.2550 A = -0.2574 B = 0.0000	I = 2.2550 A = -0.2574 B = 0.0000	I = 2.1714 A = -0.1070	I = 2.9993 A = -0.9367	I = 2.5561 A = -0.8097	
		50/50	I = 1.9283 A = -0.7029	I = 2.0082 A = -0.5107 B = -0.1529	I = 2.0082 A = -0.5107 B = -0.1529	I = 2.0082 A = -0.5107 B = -0.1529	I = 2.0190 A = -0.7545	I = 1.5732 A = -0.3413		
below -3 to -14	below 27 to 7	100/0	I = 2.5177 A = -1.7715	I = 2.5108 A = -0.4746 B = 0.0000	I = 2.5108 A = -0.4746 B = 0.0000	I = 2.5108 A = -0.4746 B = 0.0000	I = 2.8172 A = -1.2681	I = 1.9828 A = -0.5016		
		75/25	I = 2.1600 A = -1.0180	I = 2.2550 A = -0.2574 B = 0.0000	I = 2.2550 A = -0.2574 B = 0.0000	I = 2.2550 A = -0.2574 B = 0.0000	I = 2.7575 A = -1.3630	I = 2.3495 A = -0.8598		
below -14 to -26	below 7 to -14.8	100/0	I = 1.7838 A = -0.5976	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	202.1	251.2	70.4	108.7	192.5	86.2	125.4	62.4	86.6	11.2	113.5
	75/25	144.2	250.4	78.6	99.4	135.6	112.8	124.9	49.0	90.3	10.9	97.8
	50/50	27.4	52.1	15.4	24.6	45.5	15.1	31.0	12.5	15.6		
-10 / -14 ***	100/0	19.0	96.5	70.4	108.7	192.5	25.4	85.3	19.1	26.5		
	75/25	28.1	71.4	78.6	99.4	135.6	17.3	63.8	14.0	24.6		
-25	100/0	23.2	40.2	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 4-12
KILFROST ABC-S PLUS
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h				
-3 and above	27 and above	100/0	I = 2.5882 A = -0.6773	I = 2.7997 A = -0.5886 B = -0.1639	I = 2.7997 A = -0.5886 B = -0.1639	I = 2.7997 A = -0.5886 B = -0.1639	I = 2.1349 A = -0.0810	I = 3.2080 A = -1.0102	I = 2.5437 A = -0.6337	CAUTION: No holdover time guidelines exist
		75/25	I = 2.4204 A = -0.6975	I = 2.5586 A = -0.5815 B = -0.1638	I = 2.5586 A = -0.5815 B = -0.1638	I = 2.5586 A = -0.5815 B = -0.1638	I = 2.1108 A = -0.2951	I = 2.5019 A = -0.7097	I = 2.4230 A = -0.7288	
		50/50	I = 1.8988 A = -0.5888	I = 2.1742 A = -0.6668 B = 0.0000	I = 2.1742 A = -0.6668 B = 0.0000	I = 2.1742 A = -0.6668 B = 0.0000	I = 2.2203 A = -0.8993	I = 1.7490 A = -0.4516		
below -3 to -14	below 27 to 7	100/0	I = 2.7468 A = -1.4224	I = 2.7997 A = -0.5886 B = -0.1639	I = 2.7997 A = -0.5886 B = -0.1639	I = 2.7997 A = -0.5886 B = -0.1639	I = 2.9992 A = -1.4676	I = 2.3542 A = -0.7931		
		75/25	I = 2.3554 A = -1.0359	I = 2.5586 A = -0.5815 B = -0.1638	I = 2.5586 A = -0.5815 B = -0.1638	I = 2.5586 A = -0.5815 B = -0.1638	I = 2.8273 A = -1.3891	I = 2.1553 A = -0.6538		
below -14 to -28	below 7 to -18.4	100/0	I = 1.9370 A = -0.5185	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	130.3	242.3	72.8	124.9	253.7	110.8	119.8	62.5	121.0	22.7	126.1
	75/25	85.7	162.3	42.8	72.9	146.8	60.5	80.3	32.3	51.4	11.4	82.0
	50/50	30.7	52.7	17.5	32.2	94.1	16.5	39.1	13.1	17.6		
-10 / -14 ***	100/0	56.6	208.3	60.2	103.2	209.7	23.1	94.1	17.6	29.6		
	75/25	42.8	110.6	35.4	60.2	121.3	19.1	71.8	17.4	26.7		
-25	100/0	37.5	60.4	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 4-13
LNT SOLUTIONS E450
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h				
-3 and above	27 and above	100/0	I = 2.3993 A = -0.5014	I = 2.6188 A = -0.4800 B = -0.2407	I = 2.6188 A = -0.4800 B = -0.2407	I = 2.6188 A = -0.4800 B = -0.2407	I = 2.2934 A = -0.2865	I = 2.4233 A = -0.4763	I = 2.5400 A = -0.6311	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 -14	below 27 to 7	100/0	I = 2.6898 A = -1.0623	I = 2.6188 A = -0.4800 B = -0.2407	I = 2.6188 A = -0.4800 B = -0.2407	I = 2.6188 A = -0.4800 B = -0.2407	I = 2.2217 A = -0.1785	I = 2.7806 A = -0.6994		
		75/25	n/a	n/a	n/a	n/a	n/a	n/a		
below -14 to -22.5	below 7 to -8.5	100/0	I = 2.0571 A = -0.7805	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	111.9	177.2	60.2	93.4	202.3	94.2	123.9	57.2	78.1	22.7	125.6
	75/25	n/a	n/a	n/a	n/a	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	n/a	n/a	n/a	n/a
-10 / -14 ***	100/0	88.6	234.4	45.5	70.6	152.9	105.4	125.0	63.5	100.3		
	75/25	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		
-25	100/0	32.5	66.4	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 4-14
NEWAVE AEROCHEMICAL FCY 9311
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h				
-3 and above	27 and above	100/0	I = 2.6186 A = -0.7874	I = 2.8340 A = -0.7480 B = -0.3361	I = 2.8340 A = -0.7480 B = -0.3361	I = 2.8340 A = -0.7480 B = -0.3361	I = 2.5218 A = -0.6026	I = 2.7035 A = -0.8019	I = 2.4128 A = -0.6988	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 -14	below 27 to 7	100/0	I = 2.4840 A = -1.3099	I = 2.8340 A = -0.7480 B = -0.3361	I = 2.8340 A = -0.7480 B = -0.3361	I = 2.8340 A = -0.7480 B = -0.3361	I = 2.4894 A = -0.8313	I = 2.3272 A = -0.7195		
		75/25	n/a	n/a	n/a	n/a	n/a	n/a		
below -14 to -29.5	below 7 to -21.1	100/0	I = 1.9261 A = -0.6637	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	117.0	240.8	35.8	71.0	174.7	70.9	126.1	38.2	64.6	12.7	84.0
	75/25	n/a	n/a	n/a	n/a	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	n/a	n/a	n/a	n/a
-10 / -14 ***	100/0	37.0	122.9	24.2	48.0	118.1	36.6	81.0	21.0	33.6		
	75/25	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		
-25	100/0	29.0	53.2	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 4-15
SHAANXI CLEANWAY AVIATION CLEANSURFACE IV
REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Outside Air Temperature		Fluid Dilution	Regression Coefficients for Calculating Holdover Times Under Various Weather Conditions							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals ¹	Snow, Snow Grains or Snow Pellets ^{2,3}			Freezing Drizzle ¹	Light Freezing Rain ¹	Rain on Cold Soaked Wing ¹	Other
				< 4 g/dm ² /h	4 to <10 g/dm ² /h	≥ 10 g/dm ² /h				
-3 and above	27 and above	100/0	I = 2.5037 A = -0.3903	I = 3.3279 A = -0.6974 B = -0.8278	I = 3.3279 A = -0.6974 B = -0.8278	I = 3.3279 A = -0.6974 B = -0.8278	I = 2.2230 A = -0.1299	I = 1.9595 A = -0.0138	I = 2.7249 A = -0.8143	CAUTION: No holdover time guidelines exist
		75/25	I = 2.5266 A = -0.4875	I = 3.2662 A = -0.8594 B = -0.6150	I = 3.2662 A = -0.8594 B = -0.6150	I = 3.2662 A = -0.8594 B = -0.6150	I = 2.7184 A = -0.9235	I = 1.9155 A = -0.2570	I = 2.4087 A = -0.7760	
		50/50	I = 2.4207 A = -0.8825	I = 2.9686 A = -1.0764 B = -0.4446	I = 2.9686 A = -1.0764 B = -0.4446	I = 2.9686 A = -1.0764 B = -0.4446	I = 2.2650 A = -0.7956	I = 1.7827 A = -0.4609		
below -3 to -14	below 27 to 7	100/0	I = 2.6480 A = -1.2687	I = 3.3279 A = -0.6974 B = -0.8278	I = 3.3279 A = -0.6974 B = -0.8278	I = 3.3279 A = -0.6974 B = -0.8278	I = 2.7839 A = -1.1024	I = 2.4424 A = -0.8195		
		75/25	I = 2.3477 A = -0.9386	I = 3.2662 A = -0.8594 B = -0.6150	I = 3.2662 A = -0.8594 B = -0.6150	I = 3.2662 A = -0.8594 B = -0.6150	I = 2.5842 A = -0.9804	I = 2.3692 A = -0.6948		
below -14 to -28.5	below 7 to -19.3	100/0	I = 1.9241 A = -0.6900	I = 1.7680 A = -0.7757 B = 0.0000	I = 1.7565 A = -0.7565 B = 0.0000	I = 1.2435 A = -0.2435 B = 0.0000				

1 Regression Equation: $t = 10^I R^A$, where R = precipitation rate (g/dm²/h)
 2 Regression Equation: $t = 10^I R^A (2-T)^B$, where R = precipitation rate (g/dm²/h) and T = temperature (in °C)
 3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes)										
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)	
		5	2	25	10	LUPR*	13	5	25	13	75	5
+1 / -3 **	100/0	170.2	243.3	59.5	112.7	346.2	119.8	135.6	87.1	87.9	15.8	143.1
	75/25	153.4	239.8	43.1	94.8	378.1	48.9	118.3	36.0	42.6	9.0	73.5
	50/50	63.7	142.9	14.2	38.1	139.4	23.9	51.2	13.8	18.6		
-10 / -14 ***	100/0	57.7	184.5	22.7	43.0	132.2	36.0	103.1	19.8	33.8		
	75/25	49.2	116.2	21.1	46.4	184.9	31.1	79.2	25.0	39.4		
-25	100/0	27.7	52.0	8.0	10.0	25.0						

* Refer to Table 5 for the lowest usable precipitation rates in snow
 ** Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C
 *** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 4-16
TYPE IV GENERIC
VERIFICATION TABLE

Outside Air Temp. (°C)	Fluid Dilution	HOTDS Verification Times Under Various Weather Conditions (minutes) <i>As Calculated from Regression Coefficients</i>											
		Freezing Fog or Ice Crystals (g/dm ² /h)		Snow, Snow Grains or Snow Pellets (g/dm ² /h)			Freezing Drizzle (g/dm ² /h)		Light Freezing Rain (g/dm ² /h)		Rain on Cold Soaked Wing (g/dm ² /h)		
		5	2	25	10	3	13	5	25	13	75	5	
+1 / -3 *	100/0	74.8	161.9	35.8	71.0	166.5	39.2	87.8	37.4	42.2	8.7	84.0	
	75/25	85.7	162.3	42.8	72.9	135.6	48.9	80.3	32.3	42.6	9.0	73.5	
	50/50	27.4	52.1	14.2	24.6	45.5	15.1	31.0	9.4	15.6			
-10 / -14 **	100/0	19.0	96.5	22.7	43.0	117.6	23.1	81.0	17.6	26.5			
	75/25	28.1	71.4	21.1	46.4	117.6	17.3	62.6	14.0	24.6			
-25	100/0	21.4	40.2	8.0	10.0	25.0							

* Rain on cold soaked wing calculated at +1°C; all other conditions calculated at -3°C

** Freezing fog and snow calculated at -14°C; freezing drizzle and light freezing rain calculated at -10°C

TABLE 5
LOWEST USABLE PRECIPITATION RATES IN SNOW¹
TYPE II, TYPE III AND TYPE IV FLUIDS²

Type II De/Anti-Icing Fluids				
FLUID DILUTION	100/0		75/25	50/50
TEMPERATURE	-14°C AND ABOVE	BELOW -14°C	-14°C AND ABOVE	-3°C AND ABOVE
ABAX Ecowing 26	2 g/dm ² /h	3 g/dm ² /h	2 g/dm ² /h	3 g/dm ² /h
Aviation Shaanxi Hi-Tech Cleanwing II	4 g/dm ² /h	10 g/dm ² /h	4 g/dm ² /h	7 g/dm ² /h
Beijing Yadilite Aviation YD-102 Type II	2 g/dm ² /h	3 g/dm ² /h	2 g/dm ² /h	2 g/dm ² /h
Clariant Safewing MP II FLIGHT	3 g/dm ² /h	3 g/dm ² /h	2 g/dm ² /h	3 g/dm ² /h
Clariant Safewing MP II FLIGHT PLUS	5 g/dm ² /h	10 g/dm ² /h	3 g/dm ² /h	4 g/dm ² /h
Cryotech Polar Guard® II	3 g/dm ² /h	3 g/dm ² /h	2 g/dm ² /h	2 g/dm ² /h
Kilfrost ABC-Ice Clear II	3 g/dm ² /h	3 g/dm ² /h	3 g/dm ² /h	2 g/dm ² /h
Kilfrost ABC-K Plus	4 g/dm ² /h	10 g/dm ² /h	4 g/dm ² /h	2 g/dm ² /h
Newave Aerochemical FCY-2	2 g/dm ² /h	10 g/dm ² /h	2 g/dm ² /h	2 g/dm ² /h
Newave Aerochemical FCY-2 Bio+	2 g/dm ² /h	3 g/dm ² /h	2 g/dm ² /h	3 g/dm ² /h
Type II Grandfathered Fluid Data	10 g/dm ² /h			

Type III De/Anti-Icing Fluids				
FLUID DILUTION	100/0		75/25	50/50
TEMPERATURE	-25°C AND ABOVE	BELOW -25°C	-10°C AND ABOVE	-3°C AND ABOVE
AllClear AeroClear MAX	2 g/dm ² /h	3 g/dm ² /h	not applicable	not applicable
Clariant Safewing MP III 2031 ECO	2 g/dm ² /h			

Type IV De/Anti-Icing Fluids				
FLUID DILUTION	100/0		75/25	50/50
TEMPERATURE	-14°C AND ABOVE	BELOW -14°C	-14°C AND ABOVE	-3°C AND ABOVE
ABAX Ecowing AD-49	3 g/dm ² /h			
Clariant Max Flight 04	2 g/dm ² /h	3 g/dm ² /h	not applicable	not applicable
Clariant Max Flight AVIA	2 g/dm ² /h	3 g/dm ² /h	not applicable	not applicable
Clariant Max Flight SNEG	3 g/dm ² /h			
Clariant Safewing EG IV NORTH	2 g/dm ² /h	3 g/dm ² /h	not applicable	not applicable
Clariant Safewing MP IV LAUNCH	3 g/dm ² /h	3 g/dm ² /h	3 g/dm ² /h	2 g/dm ² /h
Clariant Safewing MP IV LAUNCH PLUS	3 g/dm ² /h	3 g/dm ² /h	3 g/dm ² /h	2 g/dm ² /h
Cryotech Polar Guard® Advance	3 g/dm ² /h	3 g/dm ² /h	2 g/dm ² /h	2 g/dm ² /h
Deicing Solutions ECO-SHIELD®	2 g/dm ² /h	3 g/dm ² /h	not applicable	not applicable
Dow UCAR Endurance EG106	3 g/dm ² /h	3 g/dm ² /h	not applicable	not applicable
Dow UCAR FlightGuard AD-49	3 g/dm ² /h			
Kilfrost ABC-S Plus	3 g/dm ² /h	3 g/dm ² /h	3 g/dm ² /h	2 g/dm ² /h
LNT Solutions E450	2 g/dm ² /h	3 g/dm ² /h	not applicable	not applicable
Newave Aerochemical FCY 9311	3 g/dm ² /h	3 g/dm ² /h	not applicable	not applicable
Shaanxi Cleanway Cleansurface IV	2 g/dm ² /h	3 g/dm ² /h	2 g/dm ² /h	3 g/dm ² /h

1 The lowest precipitation rate to be used as an input to the snow regression equations is constrained by the higher of: (1) the minimum demonstrated precipitation measuring equipment rates in accordance with the FAA LWES AC (in no case less than 2.0 g/dm²/h) or (2) the lowest usable precipitation rate (LUPR) for the fluid/dilution/temperature as defined in this table.

2 Type I fluids are limited only by the general precipitation rate limitations set out in the FAA LWES AC.