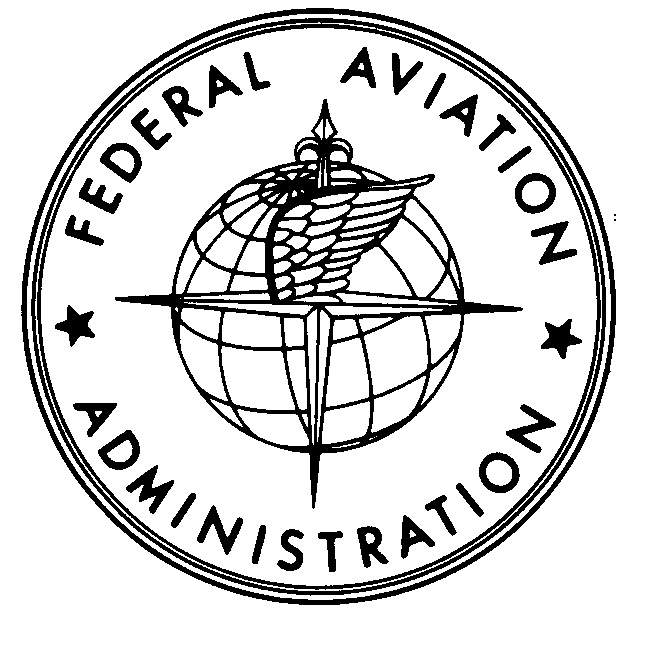
# FAA HOLDOVER TIME GUIDELINES REGRESSION INFORMATION



**WINTER 2022-2023**

**ORIGINAL ISSUE: July 29, 2022**

**The content of this document is the official FAA winter 2022-2023 holdover time guidelines 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 404-305-7267.

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

The Holdover Times Tables and related information can be found at the FAA’s [Aircraft Ground Deicing website](https://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/deicing/).

To receive notifications on updates to the Holdover Times Tables and related information, subscribe to the Aircraft Ground Deicing website by clicking on this [link](https://public.govdelivery.com/accounts/USAFAA/subscriber/new?topic_id=USAFAA_459).

## 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/>.

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## Highlights and Changes for Winter 2022-2023

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

**Type I Fluid**

* The Type I regression coefficients are unchanged.

**Type II Fluid**

* Regression coefficients tables and verification tables have been added for the two new Type II fluids, added to the holdover time (HOT) guidelines for winter 2022-2023: Kilfrost Limited Ice Clear II, and MKS DevO COREICEPHOB Type II.
* The regression coefficients table and verification table for Beijing Yadilite Aviation YD-102 Type II have been removed.
* Several changes were made to the Type II generic holdover times for winter 2022-2023. The Type II generic verification table has been updated accordingly.

**Type III Fluid**

* A regression coefficient table and verification table has been added for AllClear AeroClear MAX on Middle Speed Aircraft.

**Type IV Fluid**

* Supplemental testing in very cold snow resulted in changes to some Type IV fluids snow holdover times at temperatures below -14°C for winter 2022-2023. The related regression information has been updated accordingly.
* Supplemental testing in heavy snow resulted in changes to the ASGlobal 4Flite PG snow holdover times. The related regression information has been updated accordingly.

**Guidance**

* The guidance section remains unchanged.

## 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 2022-2023 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 2021-22 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) 120-112 *Use of**Liquid Water Equivalent System (LWES) to Determine Holdover Times or Check Times for Anti-icing Fluids* (latest version). Throughout this document, AC 120-112 is referred as the FAA LWES AC. 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. (One exception is the Type II and Type IV regression coefficients tables, which have a single temperature band (below -3 to -14°C) which provides the regression coefficients for both the below -3 to -8°C and below -8 to -14°C temperature bands in the Type II and Type IV holdover time tables.) 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 all Type II, Type III, and Type IV fluids. 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 76%.

**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 calculate the holdover time for each Type II 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 II holdover time.

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.

**Lowest and Highest Usable Precipitation Rates in Snow (Table 5 and Table 6)**

Snow test data for some fluids is not sufficient to support extrapolation of the regression curves to very low and/or very high rates of precipitation. The lowest usable precipitation rates (LUPRs) and highest usable precipitation rates (HUPRs) in snow have been identified and are included in Table 5 (LUPRs) and Table 6 (HUPRs) for Type II, III and IV fluids (Type I fluids are not affected). The LUPRs and HUPRs differ by fluid brand, fluid dilution and temperature.

**NOTE:** At this time LUPRs and HUPRs are provided for snow only; LUPRs and HUPRs are not provided for any other precipitation type. The lowest and highest precipitation rates that can be used in other precipitation types are 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 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 (this does not apply to other precipitation types) is constrained by the lower of the following:

1. The highest precipitation rate for snow stated in the FAA LWES AC (50 g/dm²/h); and
2. The highest usable precipitation rate (HUPR) for each fluid/dilution/temperature as defined in Table 6 of this document. The HUPR is the highest precipitation rate for which sufficient snow data exists to support use of the regression coefficients.

* 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 2022-2023

The regression information for winter 2022-2023 is presented in a series of tables on the following pages. The regression information tables are presented first and are followed by the tables of highest and lowest usable precipitation rates.

The regression information tables are sorted by fluid type (Type I, then Type II, then Type III, then Type IV). Within each fluid type group, the tables are arranged in alphabetical order. The tables are as follows:

* Tables 1-1 to 1-2: Type I Fluid Regression Information Tables
* Tables 2-1 to 2-14: Type II Fluid Regression Information Tables
* Tables 3-1 to 3-3: Type III Fluid Regression Information Tables
* Tables 4-1 to 4-28: Type IV Fluid Regression Information Tables

The tables of highest and lowest usable precipitation rates are presented following the regression information. The tables are as follows:

* Table 5: Lowest Usable Precipitation Rates
* Table 6: Highest Usable Precipitation Rates

### Table 1-1: Generic Type I (Aluminum Wing Surfaces)

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Generic SAE Type I Fluid Applied on Aluminum Surfaces

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°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

Verification Table for Generic SAE Type I Fluid Applied on Aluminum Surfaces

\* 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

Regression Coefficients for Generic SAE Type I Fluid Applied on Composite Surfaces

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°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

Verification Table for Generic SAE Type I Fluid Applied on Composite Surfaces

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

### Table 2-1: ABAX ECOWING AD-2

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for ABAX ECOWING AD-2

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for ABAX ECOWING AD-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

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

### Table 2-2: Aviation Xi’an High-Tech (Formerly Aviation Shaanxi Hi-Tech) Cleanwing II

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Aviation Xi'an Cleanwing II

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Aviation Xi'an Cleanwing II

\* 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: Clariant Safewing MP II FLIGHT

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Clariant Safewing MP II FLIGHT

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

4 Calculate value using both sets of coefficients; take shortest holdover time calculated

Verification Table for Clariant Safewing MP II FLIGHT

\* 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 PLUS

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Clariant Safewing MP II FLIGHT PLUS

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Clariant Safewing MP II FLIGHT PLUS

\* 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: Cryotech Polar Guard® II

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Cryotech Polar Guard II

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Cryotech Polar Guard II

\* 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: JSC RCP NORDIX Defrost PG 2

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for JSC RCP Nordix Defrost PG 2

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for JSC RCP Nordix Defrost PG 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

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

### Table 2-7: Kilfrost ABC-K Plus

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Kilfrost ABC-K Plus

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Kilfrost ABC-K Plus

\* 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 Ice Clear II

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Kilfrost Ice Clear II

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Kilfrost Ice Clear II

\* 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: MKS DevO COREICEPHOB Type II

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for MKS DevO COREICEPHOB Type II

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for MKS DevO COREICEPHOB Type II

\* 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

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Newave Aerochemical FCY-2

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Newave Aerochemical FCY-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

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

### Table 2-11: Newave Aerochemical FCY-2 Bio+

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Newave Aerochemical FCY-2 Bio+

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Newave Aerochemical FCY-2 Bio+

\* 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: ROMCHIM ADD-PROTECT NG Type II

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Romchim ADD-PROTECT NG TYPE II

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Romchim ADD-PROTECT NG TYPE II

\* 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 2-13: ROMCHIM ADD-PROTECT Type II

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Romchim ADD-PROTECT TYPE II

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Romchim ADD-PROTECT TYPE II

\* 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 2-14: Type II Generic

VERIFICATION TABLE

Verification Table for Generic SAE Type II Fluids

\* 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 on Low Speed Aircraft

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for AllClear AeroClear MAX Applied Unheated on Low Speed Aircraft

1 CAUTION: Fluid must be applied unheated on aircraft conforming to the SAE AS5900 low speed aerodynamic test criterion to use these regression coefficients

2 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

3 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

4 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for AllClear AeroClear MAX Applied Unheated on Low Speed Aircraft

\* 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 on Middle Speed Aircraft

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for AllClear AeroClear MAX Applied Unheated on Middle Speed Aircraft

1 CAUTION: Fluid must be applied unheated on aircraft conforming to the SAE AS5900 low speed aerodynamic test criterion to use these regression coefficients

2 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

3 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

4 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for AllClear AeroClear MAX Applied Unheated on Middle Speed Aircraft

\* 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: AllClear AeroClear MAX, Applied Unheated on High Speed Aircraft

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for AllClear AeroClear MAX Applied Unheated on High Speed Aircraft

1 CAUTION: Fluid must be applied unheated on aircraft conforming to the SAE AS5900 high speed aerodynamic test criterion to use these regression coefficients

2 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

3 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

4 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for AllClear AeroClear MAX Applied Unheated on High Speed Aircraft

\* 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

Regression Coefficients for ABAX ECOWING AD-49

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for ABAX ECOWING AD-49

\* 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: AllClear ClearWing ECO

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for AllClear ClearWing ECO

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for AllClear ClearWing ECO

\* 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: AllClear ClearWing EG

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for AllClear ClearWing EG

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for AllClear ClearWing EG

\* 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: ASGlobal 4Flite EG

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for ASGlobal 4Flite EG

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for ASGlobal 4Flite EG

\* 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: ASGlobal 4Flite PG

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for ASGlobal 4Flite PG

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for ASGlobal 4Flite PG

\* 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: AVIAFLUID AVIAFlight EG

**REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE**

Regression Coefficients for AVIAFLUID AVIAFlight EG

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for AVIAFLUID AVIAFlight EG

\* 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: AVIAFLUID AVIAFlight PG

**REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE**

Regression Coefficients for AVIAFLUID AVIAFlight PG

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for AVIAFLUID AVIAFlight PG

\* 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: CHEMCO ChemR EG IV

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for CHEMCO ChemR EG IV

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for CHEMCO ChemR EG IV

\* 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: CHEMCO ChemR Nordik IV

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for CHEMCO ChemR Nordik IV

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for CHEMCO ChemR Nordik IV

\* 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: Clariant Max Flight 04

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Clariant Max Flight 04

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

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.

Verification Table for Clariant Max Flight 04

\* 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: Clariant Max Flight AVIA

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Clariant Max Flight AVIA

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Clariant Max Flight AVIA

\* 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: Clariant Max Flight SNEG

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Clariant Max Flight SNEG

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Clariant Max Flight SNEG

\* 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: Clariant Safewing EG IV NORTH

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Clariant Safewing EG IV NORTH

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Clariant Safewing EG IV NORTH

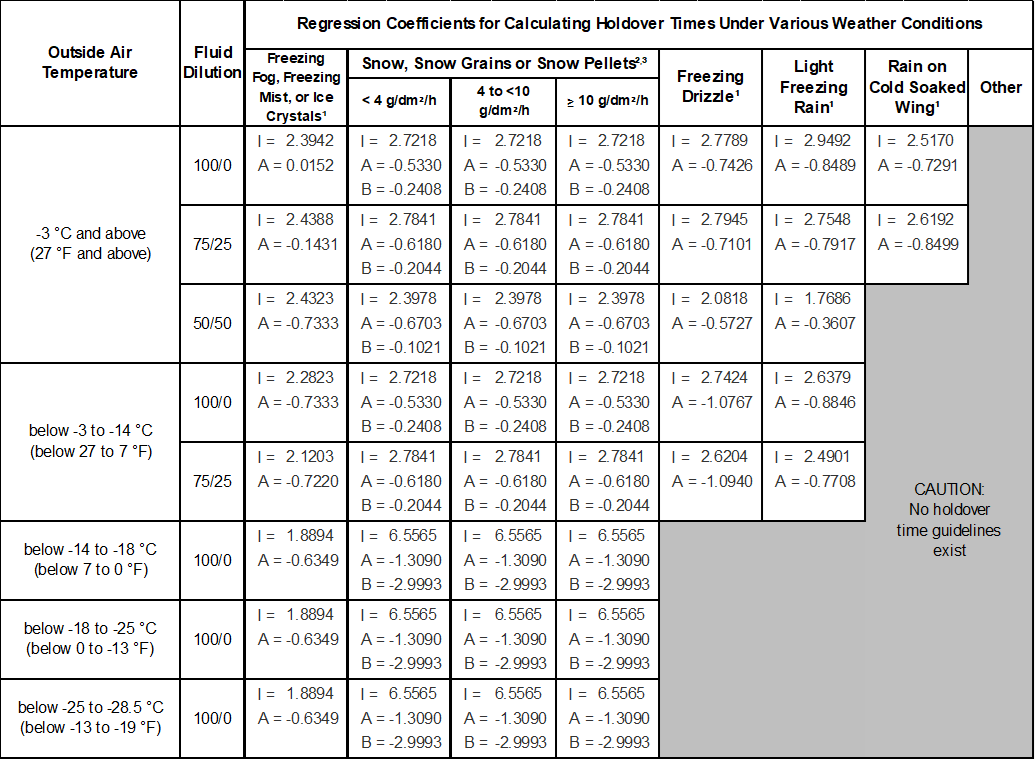
\* Refer to Table 5 for the lowest usable precipitation rates in snow

\*\* 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: Clariant Safewing MP IV LAUNCH

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE



1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Clariant Safewing MP IV LAUNCH

\* 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: Clariant Safewing MP IV LAUNCH PLUS

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Clariant Safewing MP IV LAUNCH PLUS

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Clariant Safewing MP IV LAUNCH PLUS

\* 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: Cryotech Polar Guard® Advance

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Cryotech Polar Guard Advance

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Cryotech Polar Guard Advance

\* 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 4-17: Cryotech Polar Guard® Xtend

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Cryotech Polar Guard Xtend

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Cryotech Polar Guard Xtend

\* 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 4-18: Dow Chemical UCAR™ Endurance EG106

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Dow UCAR Endurance EG106

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Dow UCAR Endurance EG106

\* 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 4-19: Dow Chemical UCAR™ FlightGuard AD-49

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Dow UCAR FlightGuard AD-49

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Dow UCAR FlightGuard AD-49

\* 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 4-20: Inland Technologies ECO-SHIELD®

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Inland Technologies ECO-SHIELD

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Inland Technologies ECO-SHIELD

\* 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 4-21: JSC RCP NORDIX Defrost ECO 4

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for JSC RCP Nordix Defrost ECO 4

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for JSC RCP Nordix Defrost ECO 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

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

### Table 4-22: JSC RCP NORDIX Defrost EG 4

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for JSC RCP Nordix Defrost EG 4

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for JSC RCP Nordix Defrost EG 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

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

### Table 4-23: JSC RCP NORDIX Defrost NORTH 4

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for JSC RCP Nordix Defrost NORTH 4

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for JSC RCP Nordix Defrost NORTH 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

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

### Table 4-24: Kilfrost ABC-S Plus

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Kilfrost ABC-S Plus

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Kilfrost ABC-S Plus

\* 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 4-25: Newave Aerochemical FCY 9311

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Newave Aerochemical FCY 9311

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Newave Aerochemical FCY 9311

\* 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 4-26: Newave Aerochemical FCY-EGIV

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Newave Aerochemical FCY-EGIV

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Newave Aerochemical FCY-EGIV

\* 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 4-27: Shaanxi Cleanway Aviation Cleansurface IV

REGRESSION COEFFICIENTS TABLE AND VERIFICATION TABLE

Regression Coefficients for Shaanxi Cleanway Cleansurface IV

1 Regression Equation: t = 10I RA, where t = holdover time (minutes) and R = precipitation rate (g/dm²/h)

2 Regression Equation: t = 10I RA (2-T)B, where t = holdover time (minutes), R = precipitation rate (g/dm²/h) and T = temperature (°C)

3 CAUTION: Use of these coefficients is limited by the lowest usable precipitation rates provided in Table 5 and the highest usable precipitation rates provided in Table 6

Verification Table for Shaanxi Cleanway Cleansurface IV

\* 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 4-28: Type IV Generic

VERIFICATION TABLE

Verification Table for SAE Type IV Generic Fluids

\* 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 AD-2 | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h |
| Aviation Xi’an High-Tech (Formerly Aviation Shaanxi Hi-Tech) Cleanwing II | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h |
| Clariant Safewing MP II FLIGHT | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h |
| Clariant Safewing MP II FLIGHT PLUS | 4 g/dm²/h | 10 g/dm²/h | 3 g/dm²/h | 4 g/dm²/h |
| Cryotech Polar Guard® II | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h |
| JSC RCP NORDIX Defrost PG 2 | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h |
| Kilfrost ABC-K Plus | 3 g/dm²/h | 10 g/dm²/h | 4 g/dm²/h | 3 g/dm²/h |
| Kilfrost Ice Clear II | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| MKS DevO COREICEPHOB Type II | 3 g/dm²/h | 3 g/dm²/h | not applicable | 3 g/dm²/h |
| Newave Aerochemical FCY-2 | 3 g/dm²/h | 10 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h |
| Newave Aerochemical FCY-2 Bio+ | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h |
| ROMCHIM ADD-PROTECT NG Type II | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h |
| ROMCHIM ADD-PROTECT Type II | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/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 | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |

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.

**TABLE 5: LOWEST USABLE PRECIPITATION RATES IN SNOW¹ (cont’d)**

TYPE II, TYPE III AND TYPE IV FLUIDS²

| **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/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| AllClear ClearWing ECO | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| AllClear ClearWing EG | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| ASGlobal 4Flite EG | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| ASGlobal 4Flite PG | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| AVIAFLUID AVIAFlight EG | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| AVIAFLUID AVIAFlight PG | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| CHEMCO ChemR EG IV | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| CHEMCO ChemR Nordik IV | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| Clariant Max Flight 04 | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| Clariant Max Flight AVIA | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| Clariant Max Flight SNEG | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h |
| Clariant Safewing EG IV NORTH | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| Clariant Safewing MP IV LAUNCH | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h |
| Clariant Safewing MP IV LAUNCH PLUS | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h |
| Cryotech Polar Guard® Advance | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h |
| Cryotech Polar Guard® Xtend | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| Dow UCAR Endurance EG106 | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| Dow UCAR FlightGuard AD-49 | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| Inland Technologies ECO-SHIELD® | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| JSC RCP NORDIX Defrost ECO 4 | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| JSC RCP NORDIX Defrost EG 4 | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| JSC RCP NORDIX Defrost NORTH 4 | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| Kilfrost ABC-S Plus | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h |
| Newave Aerochemical FCY 9311 | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| Newave Aerochemical FCY-EGIV | 3 g/dm²/h | 3 g/dm²/h | not applicable | not applicable |
| Shaanxi Cleanway Cleansurface IV | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/h | 3 g/dm²/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.

### Table 6: Highest 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 AD-2 | 50 g/dm²/h | 25 g/dm²/h | 50 g/dm²/h | 50 g/dm²/h |
| Aviation Xi’an High-Tech (Formerly Aviation Shaanxi Hi-Tech) Cleanwing II | 50 g/dm²/h | 25 g/dm²/h | 50 g/dm²/h | 50 g/dm²/h |
| Clariant Safewing MP II FLIGHT | 50 g/dm²/h | 25 g/dm²/h | 50 g/dm²/h | 40 g/dm²/h |
| Clariant Safewing MP II FLIGHT PLUS | 50 g/dm²/h | 25 g/dm²/h | 50 g/dm²/h | 40 g/dm²/h |
| Cryotech Polar Guard® II | 50 g/dm²/h | 25 g/dm²/h | 50 g/dm²/h | 50 g/dm²/h |
| JSC RCP NORDIX Defrost PG 2 | 50 g/dm²/h | 25 g/dm²/h | 50 g/dm²/h | 50 g/dm²/h |
| Kilfrost ABC-K Plus | 50 g/dm²/h | 25 g/dm²/h | 50 g/dm²/h | 25 g/dm²/h |
| Kilfrost Ice Clear II | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| MKS DevO COREICEPHOB Type II | 50 g/dm²/h | 25 g/dm²/h | not applicable | 50 g/dm²/h |
| Newave Aerochemical FCY-2 | 50 g/dm²/h | 25 g/dm²/h | 50 g/dm²/h | 50 g/dm²/h |
| Newave Aerochemical FCY-2 Bio+ | 50 g/dm²/h | 25 g/dm²/h | 50 g/dm²/h | 50 g/dm²/h |
| ROMCHIM ADD-PROTECT NG Type II | 50 g/dm²/h | 25 g/dm²/h | 50 g/dm²/h | 50 g/dm²/h |
| ROMCHIM ADD-PROTECT Type II | 50 g/dm²/h | 25 g/dm²/h | 50 g/dm²/h | 50 g/dm²/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 | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |

1 The highest precipitation rate to be used as an input to the snow regression equations is constrained by the lower of: (1) the maximum allowable precipitation rate for snow specified in the FAA LWES AC (50 g/dm²/h) or (2) the highest usable precipitation rate (HUPR) 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.

**TABLE 6: HIGHEST USABLE PRECIPITATION RATES IN SNOW¹ (cont’d)**

TYPE II, TYPE III AND TYPE IV FLUIDS²

| **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 | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| AllClear ClearWing ECO | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| AllClear ClearWing EG | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| ASGlobal 4Flite EG | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| ASGlobal 4Flite PG | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| AVIAFLUID AVIAFlight EG | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| AVIAFLUID AVIAFlight PG | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| CHEMCO ChemR EG IV | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| CHEMCO ChemR Nordik IV | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| Clariant Max Flight 04 | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| Clariant Max Flight AVIA | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| Clariant Max Flight SNEG | 50 g/dm²/h | 25 g/dm²/h | 50 g/dm²/h | 50 g/dm²/h |
| Clariant Safewing EG IV NORTH | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| Clariant Safewing MP IV LAUNCH | 50 g/dm²/h | 25 g/dm²/h | 50 g/dm²/h | 50 g/dm²/h |
| Clariant Safewing MP IV LAUNCH PLUS | 50 g/dm²/h | 25 g/dm²/h | 50 g/dm²/h | 50 g/dm²/h |
| Cryotech Polar Guard® Advance | 50 g/dm²/h | 25 g/dm²/h | 50 g/dm²/h | 50 g/dm²/h |
| Cryotech Polar Guard® Xtend | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| Dow UCAR Endurance EG106 | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| Dow UCAR FlightGuard AD-49 | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| Inland Technologies ECO-SHIELD® | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| JSC RCP NORDIX Defrost ECO 4 | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| JSC RCP NORDIX Defrost EG 4 | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| JSC RCP NORDIX Defrost NORTH 4 | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| Kilfrost ABC-S Plus | 50 g/dm²/h | 25 g/dm²/h | 50 g/dm²/h | 50 g/dm²/h |
| Newave Aerochemical FCY 9311 | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| Newave Aerochemical FCY-EGIV | 50 g/dm²/h | 25 g/dm²/h | not applicable | not applicable |
| Shaanxi Cleanway Cleansurface IV | 50 g/dm²/h | 25 g/dm²/h | 50 g/dm²/h | 50 g/dm²/h |

1 The highest precipitation rate to be used as an input to the snow regression equations is constrained by the lower of: (1) the maximum allowable precipitation rate for snow specified in the FAA LWES AC (50 g/dm²/h) or (2) the highest usable precipitation rate (HUPR) 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.