### Aircraft Ground De/Anti-Icing Fluid Holdover Time Development Program for the 2009-10 Winter

**Abstract**

The primary objective of the 2009-10 holdover time test program was to evaluate the performance of new deicing and anti-icing fluids over the entire range of conditions encompassed by the holdover time guidelines. The objective was met by conducting endurance time tests. The procedure for these tests consisted of pouring fluids onto clean aluminum test surfaces inclined at 10°. The onset of failure was recorded as a function of time in natural snow and artificial conditions, including simulated freezing fog, freezing drizzle, light freezing rain, and rain on a cold-soaked wing. A total of 189 tests were conducted with two fluids.

Changes to the holdover time guidelines for the winter of 2010-11 include:

- Fluid-specific holdover time tables were added for Cryotech Polar Guard (new Type IV fluid) and Dow Chemical UCAR™ FlightGuard AD-49 (Type IV fluid, identical to ABAX Ecowing AD-49).
- Octagon Max-Flight was removed from the guidelines.
- Holdover times for Type I fluids on composite surfaces were added to the Frost and Type I tables.
- Reductions were made to five 75/25 cells in the Clariant Safewing MP II Flight fluid-specific table; the lowest on-wing viscosity (LOWV) for the 75/25 dilution of the fluid was reduced to 12,900 mPa.s.
- The snow column heading in all Type I, Type II, Type III and Type IV HOT tables was modified to include snow pellets.
- The “above -1°C” / “above 30°F” row in the frost table was corrected to “-1°C and above” / “30°F and above”.
- A note was added to the ice pellet allowance table to indicate that no allowance times exist for propylene glycol fluids on aircraft with rotation speeds less than 115 knots.
- In an attempt to harmonize the TC guidelines with the Association of European Airline tables, several changes were made to the HOT table footnotes, including the renumbering of the notes.
- A table of Lowest Operational Use Temperatures (LOUTs) was added to the HOT guidelines at the request of users.

It is recommended that any new Type I, Type II, Type III or Type IV fluids be evaluated over the entire range of conditions in the holdover time tables. It is also recommended that the development of fluid-specific and fluid application temperature specific guidelines for Type III fluids be initiated in the winter of 2010-11.