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15. Supplementary Notes (Funding programs, titles of related publications, etc.)

Several research reports for testing of de/anti-icing technologies were produced for previous winters on behalf of Transport Canada. These are available from the Transportation Development Centre (TDC). Several reports were produced as part of this winter's research program. Their subject matter is outlined in the preface. This project was co-sponsored by the Federal Aviation Administration.

16. Abstract

The primary objective of the 2012-13 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 10º. The onset of failure was recorded as a function of time in natural snow, artificial snow, simulated freezing fog, simulated freezing drizzle, simulated light freezing rain, and simulated rain on a cold-soaked wing. A total of 494 tests were conducted with eight fluids. Supplemental testing/analysis was also completed in support of the development of light and very light snow holdover times for Type II/IV fluids.

Changes to the holdover time guidelines for the winter of 2013-14 include:

- Fluid-specific HOT guidelines were added for two new fluids: Cryotech Polar Guard II (Type II) and Clariant Safewing MP IV Launch Plus (Type IV);
- Changes to the Clariant Safewing MP II Flight Plus 100/0 and 75/25 snow holdover times as the result of supplemental testing;
- LNT Solutions P250 (Type II) and Kilfrost ABC-4^{sustain} (Type IV) were removed from the guidelines at the request of the manufacturers. The fluids were never commercialized;
- Clariant Max Flight 04 75/25 and 50/50 dilutions were removed from the guidelines at the request of the manufacturer;
- Light and very light snow holdover times were added to many of the Type II and Type IV fluid-specific HOT tables. The "snow" column in these tables was renamed "moderate snow;"
- The FAA increased its cap on snow holdover times from 2 to 3 hours. This resulted in several increases to Type IV holdover times;
- Nine increases were made to the Type IV generic HOT guidelines as a result of removed fluids; and
- Ice crystals were added to the freezing fog column of all HOT tables.

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 guidelines. It is also recommended that fluid-specific and fluid application temperature specific holdover time guidelines for Type III fluids be developed in the winter of 2013-14 and that further testing be carried out to evaluate holdover times of Type III fluids applied heated to composite surfaces.

17. Key Words	18. Distribution Statement
Anti-icing, deicing, deicing fluid, holdover times, precipitation, endurance times, Type I, Type II, Type III, Type IV, aircraft, ground, test, winter	Limited number of copies available from the Transportation Development Centre

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