



1. Transport Canada Publication No. TP 15156E		2. Project No.		3. Recipient's Catalogue No.	
4. Title and Subtitle Aircraft Ground De/Anti-Icing Fluid Holdover Time Development Program for the 2010-11 Winter				5. Publication Date	
				6. Performing Organization Document No. CM2169.002	
7. Author(s) Stephanie Bendickson				8. Transport Canada File No.	
9. Performing Organization Name and Address APS Aviation Inc. 6700 Cote-de-Liesse, Suite 105 Montreal, Quebec H4T 2B5 Canada				10. PWGSC File No.	
				11. PWGSC or Transport Canada Contract No.	
12. Sponsoring Agency Name and Address Transportation Development Centre (TDC) 800 René Lévesque Blvd. West, Suite 600 Montreal, Quebec H3B 1X9 Canada				13. Type of Publication and Period Covered Draft	
				14. Project Officer Howard Posluns	
15. Supplementary Notes (Funding programs, titles of related publications, etc.) <p>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.</p>					
16. Abstract <p>The primary objective of the 2010-11 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 420 tests were conducted with seven fluids.</p> <p>Changes to the holdover time guidelines for the winter of 2011-12 include:</p> <ul style="list-style-type: none">• A fluid-specific holdover time table was added for Cryotech Polar Guard Advance (new Type IV fluid);• Octagon MaxFlo and Clariant Safewing MP IV 2012 Protect were removed from the guidelines, resulting to 16 increases to the generic Type IV holdover times;• Minor increases/decreases ranging from 1 to 4 minutes were made to all eight Type II fluid-specific HOT tables, six Type IV fluid-specific HOT tables and to the generic Type II and Type IV HOT tables as a result of changes made to the Type II/IV HOT rounding protocol;• The lower limit of the lowest temperature band in the Type II and Type IV fluid-specific HOT tables was changed from "-25°C or LOUT" to the actual numeric LOUT value for each fluid;• The Type I HOT table was divided into two tables: one table containing holdover times for aluminum wing surfaces and a separate table for the holdover times for composite wing surfaces;• The upper value in the Octagon Max-Flight 04 75/25 below -3 to -14°C snow cell was increased from 1:20 to 1:25 due to a rounding error;• Additional information was added to the Lowest Operational Use Temperatures (LOUT) table; and• The Frost table was reformatted to clarify that dilutions apply only to Type II, III and IV fluids. <p>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.</p>					
17. Key Words Anti-icing, deicing, deicing fluid, holdover times, precipitation, endurance times, Type I, Type II, Type III, Type IV, aircraft, ground, test, winter			18. Distribution Statement Limited number of copies available from the Transportation Development Centre		
19. Security Classification (of this publication) Unclassified		20. Security Classification (of this page) Unclassified		21. Declassification (date) —	22. No. of Pages xvi, 82 app.
					23. Price —